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Estimated Impact of a Proposed Minimum Wage Law for Sacramento

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OVERVIEW

The Raise the Wage Sacramento Coalition has put forth a proposal to establish a \$13.50 per hour minimum wage by 2019 in the city of Sacramento (see Table 1). The minimum wage would be raised to \$11.50 on January 1, 2017; to \$12.50 on January 1, 2018; and to \$13.50 on January 1, 2019. In Section 1 of this report, we estimate the effects of the proposal on Sacramento workers and businesses, and place the proposal in context with other local minimum wage laws. In Section 2, we review the economic research literature on the effects of minimum wage increases on workers, employment, and business operations.

Table 1. Wage Schedule for the Proposed Minimum Wage Policy

Year	Nominal Dollars	Percentage Increase from Previous Year	Constant 2014 Dollars	Percentage Increase from Previous Year
2015 (actual)	\$9.00		\$8.80	
2016 (state law)	\$10.00	11.1	\$9.57	8.7
2017	\$11.50	15.0	\$10.76	12.5
2018	\$12.50	8.7	\$11.44	6.3
2019	\$13.50	8.0	\$12.09	5.6

Note: Constant dollar values are calculated using the average annual change for the past ten years of the West Urban Regional Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).

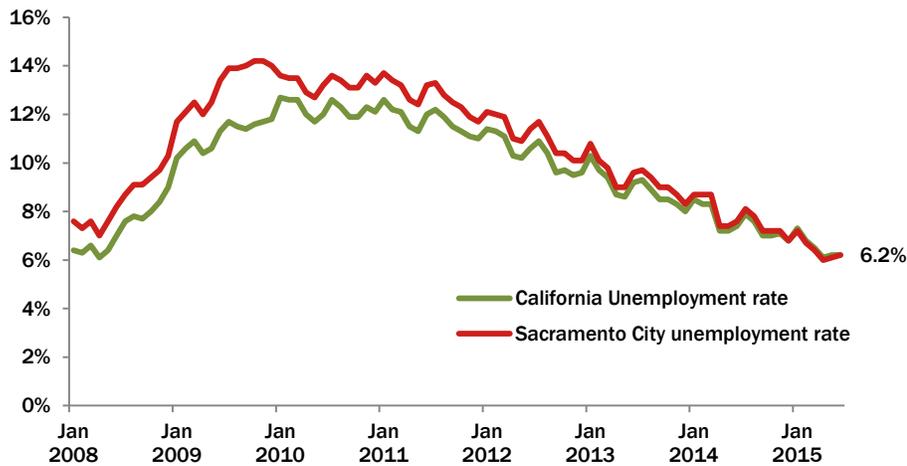
SECTION 1: IMPACT ESTIMATES

1. Background on Sacramento's economy

The unemployment rate in Sacramento has been falling faster than for the state as a whole, and as of June 2015 the unemployment rate in Sacramento (6.2 percent) is the same as California's (see Figure 1, page 4).

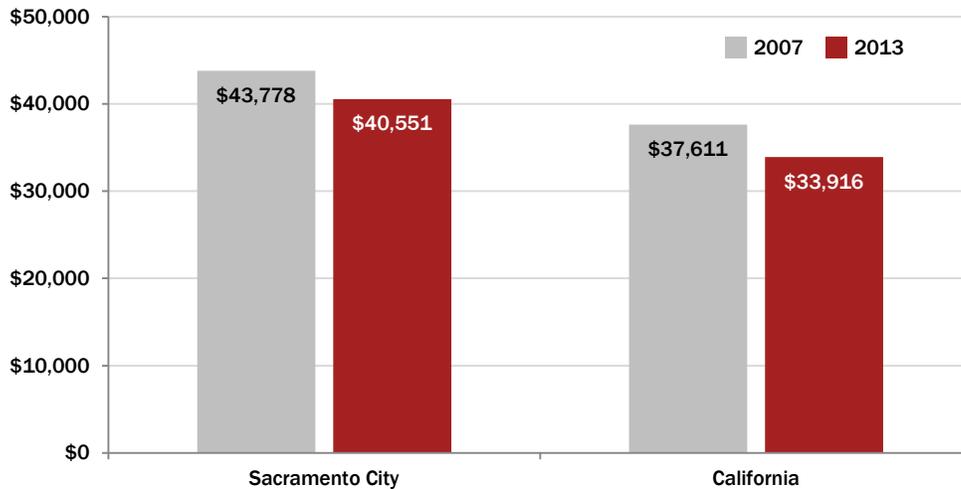
Inflation-adjusted median annual earnings have fallen by 7.4 percent for workers in the city of Sacramento since 2007 (see Figure 2, page 4). This is somewhat lower than the decline in the overall California workforce (9.8 percent).

Figure 1. Unemployment Rates, 2008-2015



Source: California Employment Development Department, Labor Market Information. Data are not seasonally adjusted.

Figure 2. Median Annual Earnings by Place of Work (2013 Dollars), 2007-2013



Source: U.S. Census Bureau, American Community Survey, Table B08521, 2007 & 2013 1-Year Estimates.

2. Data and methods

In the tables below we present estimates of the number of workers affected by the proposed law, the size of the wage gains for affected workers, and the demographic and job characteristics of affected workers. Our estimation method accounts for projected wage growth at the bottom of the wage distribution, interim increases in the state minimum wage, and projected employment growth. We use the 2012-2013 American Community Survey (ACS) to estimate the wage distribution and characteristics of covered individuals working in the city of Sacramento (the proposed minimum wage policy will not cover self-employed, state and federal workers). Because the ACS does not allow us to identify individuals who work in the city

itself, we extrapolate from data for Sacramento County, adjusted to approximate the city’s industry mix and overall employment count (the city’s employment represents 47.6 percent of county employment, according to the 2013 Quarterly Census of Employment and Wages). We calculate high and low estimates to reflect differences in estimation methods and report the average across the two estimates. See our technical report for more detail on data and methods (Perry and Bernhardt 2015).

3. Impact estimates

We estimate that about 92,000 workers—or about 37 percent of Sacramento’s workforce—would receive a pay raise by 2019 under the proposal (see Table 2). This estimate includes 78,000 workers who earn below the new minimum wage and would be directly affected by the increase, and another 14,000 who earn just above the new minimum wage and would receive wage increases due to a ripple effect.

Table 2. Cumulative Number of Workers Affected by Proposed Minimum Wage Policy

Year	Total Number of Affected Workers (cumulative)	Number of Directly-Affected Workers (cumulative)	Number of Indirectly-Affected Workers (cumulative)	Percent of Covered Workforce (cumulative)
2017	79,000	64,000	16,000	32.8
2018	85,000	69,000	15,000	34.4
2019	92,000	78,000	14,000	36.7

Source: Authors’ analysis of ACS, OES, and QCEW data. See Data and Methods Brief for details.

Note: The proposed minimum wage policy will not cover self-employed, state, and federal workers. Directly-affected workers are those with wages below the proposed new minimum wage in each year. Indirectly-affected workers are those with wages slightly above the proposed new minimum wage, who will receive an increase via the ripple effect. The number of directly-affected workers and indirectly-affected workers may not sum to the total number of affected workers due to rounding.

Workers’ hourly wages and annual income would rise under the proposed law, resulting in a total increase in aggregate earnings of \$291 million (in 2014 dollars) by 2019. Wages of affected workers would rise by an average of \$1.93 per hour. Average annual earnings would increase by about \$3,200 per year (see Table 3).

Table 3. Cumulative Pay Increases for Workers Affected by the Proposed Minimum Wage Policy (in 2014 dollars)

	2017	2018	2019
Average Cumulative Hourly Wage Increase	\$0.90	\$1.45	\$1.93
Average Cumulative Annual Earnings Increase	\$1,500	\$2,400	\$3,200
Average Cumulative Percent Annual Earnings Increase	10.6	17.1	22.7
Total Aggregate Cumulative Increase In Earnings (millions)	\$115	\$199	\$291

Source: Authors’ analysis of ACS, OES, and QCEW data.

Note: Results are cumulative across the phase-in years.

Contrary to common belief, only 5.5 percent of affected workers are teenagers, and more than half are in their thirties or older (see Table 4, page 7). Workers of color (black, Latino/a, Asian, and other) constitute approximately 59 percent of the workers receiving raises. Affected workers have a wide range of educational backgrounds, with almost 55 percent having at least some college experience and 13 percent holding a bachelor's degree or higher. Median annual earnings of affected workers are only 44 percent of those of the overall Sacramento workforce, but affected workers bring home over half of their family's income.

More than half of all affected workers are employed in four industries: food services (19.5 percent), retail trade (14.9 percent), administrative and waste management services (13.3 percent), and other services (11.3 percent). Most affected workers are employed in the private, for-profit sector; non-profits and public employees are less likely to be affected than the overall Sacramento workforce (see Table 5, page 8).

Table 6 (page 9) shows an analysis of the proposed minimum wage policy's impact on business costs. For example, we estimate that payroll costs in the restaurant industry would rise by 13.7 percent by 2019. Since payroll costs constitute 34 percent of operating costs in the restaurant industry, operating costs would increase by 4.7 percent (compared to 0.6 percent for the retail industry and 0.5 percent for the overall economy by 2019). This would lead to a cumulative price increase of 4.1 percent in restaurants by 2019—but this increase would be spread over three years, ranging from 1.1 to 1.6 percent annually. Price increases would be negligible for the retail industry and the rest of the economy.

Compared to existing state law, the proposed minimum wage policy would raise Sacramento's minimum wage by 26.4 percent (in inflation-adjusted terms). This is below the average inflation-adjusted increase of 34.1 percent in the 24 local minimum wage laws passed to date in the U.S. (see Table 7, page 9).

Under the proposal, by 2019 the ratio of the minimum wage to the median full-time wage—a metric used to determine the ability of an economy to absorb higher minimum wage levels—would be 52.8 percent (see Table 8, page 10). This ratio is well within the historical range of the federal minimum wage to median full-time wage ratio, which peaked at 55 percent in 1968 (Dube 2013).

By 2020, the proposed Sacramento minimum wage would be worth slightly more on a cost-of-living-adjusted basis than the minimum wage in San Francisco or Los Angeles. The 2020 projected San Francisco minimum wage of \$15.74 would have the same purchasing power as \$13.43 in Sacramento, and the \$15.00 minimum wage in Los Angeles would have the same purchasing power as \$13.08 in Sacramento. See Table 9 (page 10).

Table 4. Demographic and Job Characteristics of Workers Affected by the Proposed Minimum Wage Policy by 2019 (all figures are percentages unless otherwise noted)

	Percent of Covered Workers	Percent of Covered Workers Getting a Raise	Percent of Group That Is Getting a Raise
Gender			
Male	51.0	48.4	34.8
Female	49.0	51.6	38.8
Median Age	38	32	
Age			
16-19	2.5	5.5	81.0
20-29	24.2	39.8	60.4
30-39	25.5	21.1	30.4
40-54	34.0	23.7	25.6
55-64	13.8	9.9	26.3
Race/Ethnicity			
White	52.8	40.8	28.4
Black	7.0	7.4	39.3
Latino/a	21.0	29.8	51.9
Asian	14.8	17.1	42.6
Other	4.5	4.8	39.9
Education			
Less than High School	9.4	16.9	66.4
High School or G.E.D.	21.0	28.2	49.5
Some College	29.7	34.1	42.1
Associate's Degree	9.8	7.8	29.1
Bachelor's Degree or Higher	30.1	13.0	15.8
Country of Birth			
U.S. Born	72.3	64.2	32.7
Foreign Born	27.7	35.8	47.4
Family Structure			
Married	49.8	37.2	27.4
Has Children	42.6	33.4	28.9
Family Income Relative to Poverty Level (FPL)			
Less than 100% of FPL	8.8	20.4	85.0
100% to 150% of FPL	8.2	18.3	81.6
150% to 200% of FPL	9.4	16.6	64.8
Greater than 200% of FPL	73.6	44.7	22.4
Average Worker Share of Family Income	64.4	54.4	
Median Individual Annual Earnings (2014 Dollars)	\$34,900	\$15,500	
Full-Time / Part-Time Worker			
Full-Time (35 or More Hours per Week)	75.9	59.3	28.7
Part-Time (Fewer than 35 Hours per Week)	24.1	40.7	62.2
Full-Year / Part-Year Worker			
Full-Year (50-52 Weeks per Year)	84.5	78.1	34.0
Part-Year (Fewer than 50 Weeks per Year)	15.5	21.9	51.9
Health Insurance Provided by Employer			
Yes	69.7	48.0	25.3
No	30.3	52.0	63.1

Source: Authors' analysis of ACS, OES, and QCEW data.

Note: Only workers covered by the proposed minimum wage law are included in this table. See note for Table 2.

Table 5. Impact Estimates for Major Industries by 2019

	Percent of Covered Workers	Percent of Covered Workers Getting a Raise	Percent of Industry That Is Getting a Raise
All Sectors			
Agriculture, Forestry, Fishing, Hunting, and Mining	0.1	0.1	
Construction	4.1	3.1	27.6
Manufacturing	4.9	3.1	23.6
Wholesale Trade	4.5	3.1	25.4
Retail Trade	10.2	14.9	53.7
Transportation, Warehousing, and Utilities	3.8	2.6	25.5
Information	2.7	1.4	19.8
Finance, Insurance, Real Estate, and Rental and Leasing	5.1	3.0	21.4
Professional, Scientific, and Management	10.7	4.2	14.6
Administrative and Waste Management Services	9.3	13.3	52.6
Educational Services	2.5	1.8	26.8
Health Services	14.8	8.1	20.2
Social Assistance	3.6	5.6	57.2
Arts, Entertainment, Recreation, and Accommodation	2.6	3.8	53.3
Food Services	9.3	19.5	76.9
Other Services	8.6	11.3	48.5
Public Administration	3.4	0.9	10.1
Total	100.0	100.0	
By Sector			
Private, For-Profit	80.5	87.3	39.8
Private, Non-Profit	12.7	9.2	26.7
Public	6.8	3.5	18.8
Total	100.0	100.0	

Source: Authors' analysis of ACS, OES, and QCEW data.

Note: Blank value for "Percent of Industry That is Getting a Raise" indicates insufficient sample size for that category. Only workers covered by the proposed minimum wage law are included in this table. See note for Table 2.

Table 6. Cumulative Impact of the Proposed Minimum Wage Policy on Business Operating Costs and Prices for Select Industries and the Overall Economy

	2017	2018	2019
Food Services			
% Change in Payroll Costs*	5.9	9.8	13.7
Labor Costs as % of Operating Costs	30.7	31.9	34.0
% Change in Operating Costs	1.8	3.1	4.7
Year over Year Price Increase	1.6	1.1	1.3
Cumulative Price Increase	1.6	2.8	4.1
Retail Trade			
% Change in Payroll Costs*	2.0	3.5	5.0
Labor Costs as % of Operating Costs	10.8	11.0	11.3
% Change in Operating Costs	0.2	0.4	0.6
Year over Year Price Increase	0.2	0.1	0.2
Cumulative Price Increase	0.2	0.3	0.5
Overall Economy			
% Change in Payroll Costs*	1.0	1.6	2.3
Labor Costs as % of Operating Costs	22.1	22.3	22.5
% Change in Operating Costs	0.2	0.4	0.5
Year over Year Price Increase	0.2	0.1	0.1
Cumulative Price Increase	0.2	0.3	0.5

Source: Authors' analysis of ACS, OES, QCEW, Economic Census, U.S. Census Annual Retail Trade, Wholesale Trade, and Services Reports, and BEA data.

* "% Change in Payroll Costs" is net of savings from reduced turnover expenses, and includes additional payroll tax and workers' compensation expenses.

Table 7. Proposed Sacramento Minimum Wage Increase Compared to Local Minimum Wage Increases Passed to Date

Proposed Sacramento Increase (real)	EXISTING LOCAL MINIMUM WAGE LAWS	
	Average Increase (real)	Range of Increases (real)
26.4	34.1	11.7–62.4

Source: Authors' analysis of statutory increases in 24 existing local minimum wage laws.

Note: Wage increases are calculated by deflating the final wage level to the time of the initial increase and then calculating the percentage increase over the existing minimum wage before the law was implemented. Past year inflation is obtained from the appropriate regional CPI-W series. Inflation for future years is assumed to equal the average annual inflation rate over the past ten years. Inflation is calculated using the same index specified in the law for calculating cost-of-living increases. If the law does not adjust for cost-of-living increases, the appropriate regional CPI-W series is used.

Table 8. Proposed Sacramento Minimum Wage Compared to the Sacramento Median Full-Time Wage

Year	Sacramento Minimum Wage Under Proposal	Projected Sacramento Median Full-Time Wage	Ratio
2015	\$9.00	\$23.40	38.5
2016	\$10.00	\$23.92	41.8
2017	\$11.50	\$24.45	47.0
2018	\$12.50	\$25.00	50.0
2019	\$13.50	\$25.56	52.8

Source: Authors' analysis of ACS and OES data.

Note: Median full-time wage growth is projected using the average annual change for the past ten years of the West Urban Regional Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).

Table 9. Proposed Sacramento Minimum Wage Increase Compared to San Francisco and Los Angeles Minimum Wages Adjusted to Sacramento Cost of Living

Year	Sacramento Minimum Wage Under Proposal	San Francisco		Los Angeles	
		Nominal Dollars	Cost-Adjusted Dollars	Nominal Dollars	Cost-Adjusted Dollars
2015	\$9.00	\$12.25	\$10.45	\$9.00	\$7.85
2016	\$10.00	\$13.00	\$11.09	\$10.50	\$9.15
2017	\$11.50	\$14.00	\$11.94	\$12.00	\$10.46
2018	\$12.50	\$15.00	\$12.79	\$13.25	\$11.55
2019	\$13.50	\$15.37*	\$13.11	\$14.25	\$12.42
2020	\$13.80**	\$15.74*	\$13.43	\$15.00	\$13.08

Source: Authors' analysis of BEA Regional Price Parities.

* The 2019 and 2020 San Francisco minimum wage is projected assuming a 2.45 percent cost-of-living adjustment.

** The 2020 Sacramento minimum wage is projected assuming a 2.23 percent cost-of-living adjustment.

SECTION 2: REVIEW OF ECONOMIC RESEARCH LITERATURE

1. Introduction

As cities and counties across the country increasingly debate whether to establish their own minimum wage laws, policymakers are understandably asking a host of questions. What do we know about the impact on workers and their families? What does research tell us about the effect of local wage mandates on employment, and in particular, do businesses move outside city or county borders in response?

In this section, we address these and related questions.¹ Economists agree that minimum wage laws have large positive effects on workers' pay and their families' living standards. Raising the minimum wage increases earnings for workers at the low end of the labor market, the majority of whom are adults. Women and workers of color benefit disproportionately. In addition, new research on the effect of minimum wage increases documents important reductions in family poverty rates. Moreover, low-wage workers and their families are often forced to rely on public assistance programs to meet their basic needs; new research on food stamps finds that raising the minimum wage reduces their reliance on this program.

We also review the economic research on the impact of minimum wage laws on businesses. The weight of the evidence suggests that moderate minimum wage increases have insignificant to non-existent negative effects on employment and work hours, reduce worker turnover and increase worker retention, and result in small, one-time price increases in heavily-affected industries, such as restaurants. We also explain how conflicting findings on the employment impact of the minimum wage can be traced to differences in the rigor of the research methods.

The research literature on minimum wage effects

Below we summarize the empirical evidence on the effects of minimum wage laws on workers, families, and businesses. Where possible, we highlight research on local minimum wage laws. However, since most of the existing local laws have been in place a short time, the data that are needed for rigorous research on the recent laws are not yet available. To date, rigorous economic impact studies exist only for San Francisco and Santa Fe (UC Berkeley researchers are currently studying the impact of San Jose's law).

We also draw upon the much larger body of research on the impacts of state and federal minimum wage increases. Recent studies that compare adjacent counties from different states with different minimum wages are especially relevant. The findings from these studies speak directly to policymakers' concerns that businesses might relocate employment outside their city's borders in response to a local minimum wage law.

2. The effects of minimum wage laws on workers and families

The primary goal of raising the minimum wage is, of course, to raise the pay of low-wage workers. A broad consensus in the economic research literature agrees that minimum wage laws raise pay for workers on the bottom rungs of the labor market (for an extensive review, see Belman and Wolfson 2014). Researchers also consistently find that the affected workers are largely adults and disproportionately women and people of color. In addition, new research on the effect of minimum wage increases shows important reductions

in family poverty rates. Finally, we review what is known about reliance on public assistance programs by low-wage workers and their families.

A. Impact on low-wage workers' earnings

In assessing the impact of a minimum wage increase on low-wage workers' earnings, it is important to keep two facts in mind. First, many low-paid workers earn wages somewhere above the old minimum wage level but below the new level. Consequently, not all workers who are directly affected by an increase will receive the full amount of that increase. Second, researchers have also documented a "ripple effect" from minimum wage increases in which employers give raises to workers who are earning above, but near, the new minimum wage (Wicks-Lim 2006; Autor, Manning and Smith 2015). As a result, it is not completely straightforward to estimate either how many workers benefit from minimum wage increases or the policy's impact on their earnings.

Evidence from local minimum wage laws

Dube, Naidu and Reich (2007) assessed San Francisco's minimum wage law when it was first implemented in 2004, using a before-and-after survey of restaurant employers in San Francisco and in nearby parts of neighboring Alameda County. They found that the average wage of workers at surveyed restaurants rose from \$10.22 before to \$11.01 after the increase, with pay rising twice as much among fast-food restaurants compared to table-service restaurants. They also found evidence that the increase compressed the wage distribution among restaurant workers by raising the bottom of the distribution (not by hurting pay for higher-wage workers). Before the policy, 49.7 percent of restaurant workers earned less than \$8.50; afterward, only 5 percent did. The authors also tested whether compliance with minimum wage laws decreased after the law passed; they found no evidence of decreased compliance.

Jacobs and Reich (2014) recently conducted a longer-term assessment of San Francisco's minimum wage law. They estimate that 55,000 workers in the city (or about 14 percent of the private sector workforce) receive higher pay because of the ordinance, amounting to a cumulative increase of \$1.2 billion in wages in the ten years since the laws' inception. They also found additional evidence that the law had a significant impact on workers' earnings over time. The wages of San Francisco workers earning at the bottom of the distribution (the 10th percentile) jumped in 2004, when the law was implemented. This wage, when measured to take account of inflation, did not change even during the recession that began in December 2007 because the city's minimum wage standard is indexed to inflation. By contrast, the 10th percentile wage in the surrounding counties, without an indexed minimum wage, declined over that same time period.

Additional lessons can be gleaned from Santa Fe, the other city whose minimum wage law has been extensively studied. Pollin's (2004) detailed prospective study of the city's 2004 law estimated that 17,000 workers would be directly or indirectly affected and that the directly-affected workers would see an average increase of \$2,647 in annual earnings. In a more recent prospective study, Reich (2012) estimated that San Jose's minimum wage increase from \$8 to \$10 would lead to higher pay for about 69,000 of the city's 388,000-person workforce (18.9 percent).

Schmitt and Rosnick (2011) studied the wage impacts of both the San Francisco and Santa Fe laws. These authors found that wages increased in a range of low-wage industries in both cities.² In San Francisco, for example, the average wage of fast-food workers increased 9 to 11 percent by the third year of the ordinance, and as much as 12 percent in low-wage industries overall. Pay for fast-food workers in Santa Fe increased by similar amounts, together with wage increases of 2 to 9 percent in the retail industry and 5 to 15 percent for low-wage industries overall. (See also Reynis, Segal and Bleeker (2005) for similar findings.)

Finally, a broader literature has looked at state and federal minimum wage increases and estimated their impact on workers' earnings. In their comprehensive review of existing research, Belman and Wolfson (2014) estimate that changes in the minimum wage typically affect about 10 to 20 percent of the labor force (and sometimes as much as 30 percent), counting both direct and indirect effects. The average wage increase per impacted worker depends on the size of the minimum wage increase and what the average worker was earning beforehand. As a concrete example, Schmitt (2013) analyzed federal minimum wage increases from 1989 to 2009 and estimates that impacted workers' wages rose between 8.4 and 13.6 percent. Research consistently finds that the pay of both adults and teens is affected by minimum wage increases (Allegretto, Dube and Reich 2011; Giuliano 2013).

We also note broad agreement among economists that raising the minimum wage reduces income inequality, by pushing up the wage floor relative to the median wage (Lee 1999; Autor, Manning and Smith 2015).

B. Demographics of affected workers

Evidence on who benefits from minimum wage increases comes mainly from prospective studies (conducted when a minimum wage law is first being considered). In these studies, researchers analyze government survey data and estimate the number and characteristics of workers likely to be affected, given wage thresholds being considered by law makers.

For example, drawing on results in Reich and Laitinen (2003), Lantsberg (2003) conducted a prospective study of San Francisco's first minimum wage increase in 2004 (from \$6.75 to \$8.50). He estimated that about 55,700 workers (14 percent of private sector workers) would benefit from the law, with 70 percent age 26 or older. Lantsberg also found differences by race and ethnicity. He estimated that while 9 percent of white workers would be affected, the corresponding figures were 18 percent of African American workers, 21 percent of Asian workers, and 22 percent of Hispanic workers. In his prospective study of Santa Fe's 2004 minimum wage law, Pollin (2004) similarly found that the increase would benefit mainly adult workers (many of them primary bread-winners) and especially workers of color. More recent prospective impact studies of proposed city laws by Reich, Jacobs, Bernhardt and Perry (2014a-c, 2015) have consistently found that minimum wage increases would disproportionately benefit workers of color.

At the national level, the Council of Economic Advisers (2014) analyzed the likely effects of the Harkin/Miller bill to raise the current federal minimum wage from \$7.25 to \$10.10 by 2016. The CEA found that the proposal would raise wages for 28.2 million workers (19 million directly, the remainder indirectly), or 21.4 percent of the U.S. workforce. CEA estimates that the majority of affected workers are women (55 percent) and aged 20 or older (88 percent). The CEA also estimates that black and Hispanic workers will benefit more than white workers, and that 46 percent of affected families have incomes under \$35,000 a year.

In an earlier study, Bernstein and Schmitt (1998) examined the characteristics of workers and families that benefitted from the federal minimum wage increase in the mid-1990s (from \$4.25 to \$4.75 in 1996 to \$5.15 in 1997). The researchers found that the two-step increase raised the wages of 9.9 million workers, largely adults (71 percent) and disproportionately women and black and Hispanic workers. About half of the beneficiaries worked full time, and an additional third worked 20-34 hours a week. Moreover, the average affected worker contributed 54 percent of his or her household earnings. In aggregate, 58 percent of the benefits from the minimum wage increase were received by households in the bottom 40 percent of the family income distribution.

C. Effects on poverty and use of public assistance programs

Impact on poverty

Compared to the large volume of research on the employment effects of minimum wage laws, few studies have examined the impact on poverty. A recent paper by Arindrajit Dube shows important reductions in family poverty rates from minimum wage laws.

Specifically, Dube (2013) finds that higher minimum wages increase incomes at the bottom of the family income distribution, reduce the percent of individuals living below the poverty line, and, in particular, reduce extreme poverty (families with incomes less than one-half the poverty line). The reductions in poverty are somewhat larger for black and Latino individuals, for those with less education, and for children under 18.

Based on state-of-the-art econometric methods, Dube's estimates predict that the Harkin-Miller proposal (to raise the federal minimum wage from \$7.25 to \$10.10 an hour) would reduce the number of people living in poverty in the U.S. by 4.6 million—or about a fifth of the working poor. Other recent studies, using less sophisticated statistical methods, also show that raising the minimum wage reduces poverty. The Council of Economic Advisers (2014) predicts that the proposal would raise incomes for an estimated 12 million now in poverty, lifting 2 million of them out of poverty. The Congressional Budget Office (2014) estimates that the Harkin-Miller proposal would lift 900,000 people out of poverty.

Impact on use of public assistance programs

Until recently, economists have typically not assessed the impact of minimum wage increases on the use of public assistance programs by low-wage workers and their families.

Across several years in the 2000s, researchers in four states used a consistent methodology to estimate the portion of working poor families enrolled in public assistance programs. The research teams considered major programs such as Medicaid, EITC (Earned Income Tax Credit), Food Stamps, SCHIP (State Children's Health Insurance Program), TANF (Temporary Aid to Needy Families), and subsidized child care. Their findings were remarkably consistent across the four states:

- *New York*: In 2001-2004, an estimated 890,000 working families were enrolled in at least one public assistance program, accounting for 33 percent of all public benefits spending in the state, or \$5.2 billion annually (Bernhardt, Chaddha and McGrath 2008).

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- *Illinois*: In 2001-2004, an estimated 475,000 working families were enrolled in at least one public assistance program, accounting for 37 percent of all public benefits spending in the state, or \$2.2 billion annually (Theodore and Doussard 2006).
 - *Wisconsin*: In 2001-2004, an estimated 178,000 working families were enrolled in at least one public assistance program, accounting for 45 percent of all public benefits spending in the state, or \$837 million annually (Center on Wisconsin Strategy 2006).
 - *California*: In 2002, an estimated 2 million working families were enrolled in at least one public assistance program, accounting for 48 percent of all public benefits spending in the state, or \$10.1 billion annually (Zabin, Dube and Jacobs 2004).

In all four states, low wages were the leading predictor of enrollment in public assistance programs by working families.

More recently, researchers using a similar methodology found that 56 percent of spending on food stamps, TANF cash assistance, Medicaid and CHIP, and the federal EITC is provided to members of working families, at an average cost of \$153 billion a year between 2009-2011 (Jacobs, Perry and MacGillvary 2015). Researchers further found that more than half (52 percent) of families of fast-food workers are enrolled in one or more public programs, at an annual cost of nearly \$7 billion. Again, low wages were the main predictor of public program enrollment (Allegretto, Doussard, Graham-Squire, et al. 2013).

Does raising the minimum wage reduce reliance on means-tested public assistance programs? The answer may seem obvious, but West and Reich (2014) point out that the research question is more complex. If, for example, raising the minimum wage causes increased unemployment, more workers and families would have to rely on programs such as food stamps. The authors analyze state and federal minimum wage increases from 1990-2012 and find that, on average, a 10 percent increase in the minimum wage reduces food stamp program enrollment by between 2.4 and 3.2 percent, and reduces program expenditures by 1.9 percent.³ They predict that an increase of the federal minimum wage to \$10.10 would reduce enrollment in the food stamp program by about 3.5 million people and reduce federal expenditures on food stamps by about \$4.2 billion per year. West and Reich (2014b) conducted a comparable study on the causal effects of minimum wage increases on Medicaid, with similar findings. Allegretto, Reich and West (2014) estimate that California would save \$1.5 billion if the state minimum wage were increased to \$13. Zipperer (2014) also examined the effects of minimum wages on these public programs and obtained similar results.

More generally, since eligibility for programs such as SNAP and Medicaid are tied to the federal poverty level, Dube's (2013) finding that higher minimum wages reduce the poverty rate suggests that we might also expect reductions in enrollments in public assistance programs.

3. The effects of minimum wage laws on businesses

The impact of the minimum wage on businesses—how many workers they hire, whom they hire, the prices they charge for their goods and services, their location decisions—is one of the most researched topics in economics, with hundreds of studies published over the decades. We do not attempt to summarize the full literature in this report; for recent reviews see Brown (1999), Neumark and Wascher (2006), Schmitt (2013), and Belman and Wolfson (2014).

Economists' understanding of minimum wage effects has undergone significant changes over the past 20 years. This shift began with the groundbreaking work of Card and Krueger (1994), who analyzed employment in fast-food restaurants near the New Jersey and Pennsylvania border after New Jersey increased its state minimum wage. Card and Krueger found no measurable negative impact on employment.

Since then, economists have increasingly recognized that raising the minimum wage does not automatically mean that employment will fall. Increased labor costs can be absorbed through a variety of other channels. For example, if turnover declines, employers save on recruiting and training costs at the same time that they reap the benefits of more experienced workers who are more productive. When a cost increase affects all firms in an industry, firms can also raise their prices rather than reduce the number of employees. They may also experience lower profits. Modern economics therefore regards the employment effect of a minimum wage increase as a question that is not decided by theory, but by empirical testing.

In what follows we summarize the research that in our opinion is best suited to assessing the effects of minimum wage increases on businesses. We also give an intuitive explanation of the nature of the disagreements in the research literature about those effects.

Before proceeding, it is important to mention that existing research has only studied moderate increases in the minimum wage, of the size discussed in previous sections. These studies can only be suggestive of what might occur when minimum wages are increased significantly beyond local, state, or federal mandates.

A. Impact on employment and hours

Evidence from local minimum wage laws

To our knowledge, there are only three rigorous studies of the employment impacts of existing city minimum wage laws. Dube, Naidu and Reich (2007) studied the impact of San Francisco's minimum wage law after it increased from \$6.75 to \$8.50 an hour in 2004, using a unique quasi-experimental research design. They surveyed a sample of restaurants before the wage increase, and then re-surveyed the same businesses nine to ten months after. The sample included restaurants from San Francisco as well as neighboring East Bay cities that were not covered by the policy, allowing the researchers to compare outcomes at restaurants affected by the minimum wage mandate with those that were not. The study also was able to compare outcomes at fast-food restaurants with outcomes at full-service restaurants.

After controlling for a variety of potential confounding factors, the authors found no statistically significant negative effects on either employment or the proportion of full-time jobs as a result of the San Francisco law. This finding holds for both full-service and fast-food restaurants (one might expect more sensitivity to a higher minimum wage in the latter). A follow-up study (Dube, Naidu and Reich 2014) found that restaurant employment in San Francisco rose slightly faster than in surrounding counties after the minimum wage increase, and again after San Francisco implemented two additional policies (paid sick leave and a health spending requirement). Trends in overall employment in San Francisco closely matched those in the surrounding counties during the same time period, indicating that the differential trends in restaurant employment were not caused by differences in economic growth between the two areas. Restaurants closed in San Francisco at a 2.8 percent lower rate than in nearby areas not covered by the law. This difference, however, was not statistically significant.

Potter (2006) studied the impact of Santa Fe’s minimum wage law after it increased from \$5.15 to \$8.50 in 2004, a substantial increase of 65 percent (at that time, only businesses with 25 or more employees were covered). Potter also uses a quasi-experimental research design to compare changes in employment at Santa Fe businesses before and after the ordinance went into effect and to changes in employment in nearby Albuquerque over the same time period.⁴ Potter found no statistically significant negative impact of Santa Fe’s minimum wage increase on Santa Fe employment, both at an absolute level and relative to Albuquerque. This finding held for the most affected industries of accommodation and food services, which had the highest proportion of minimum wage workers. Potter did find a decline in construction employment in both cities, with the decline stronger in Santa Fe; he ascribes this finding to differences in the timing of an overall slowing of the region’s construction boom.⁵

Finally, Schmitt and Rosnick (2011) studied the impact of the above two laws, comparing employment trends in these cities before and after their minimum wage increases to control groups of surrounding suburbs and nearby metropolitan areas.⁶ The authors found no discernible negative effects on employment, even three years after the respective ordinances were implemented. The authors focused on fast-food restaurants, food services, retail trade, and other low-wage industries.

Several additional studies of Santa Fe and San Francisco have been produced by the restaurant industry-backed Employment Policies Institute. In a study of Santa Fe, Yelowitz (2005a, 2005b) found an increase in the probability of unemployment for low-skilled workers and evidence of replacement of low-skilled adults by teens. In his study of San Francisco, Yelowitz (2012) found the opposite result: a decrease in teen work hours and no discernible effect on overall employment. Unfortunately, both studies suffer from serious methodological problems that make the results unreliable.⁷ Since higher wages are likely to increase the labor supply, unemployment *rates* can increase even as the number of people who are employed also increases. Pollin and Wicks-Lim (2005) replicate Yelowitz’s (2005a) study but look at employment, rather than unemployment. They find no negative impact on employment. Furthermore, even if the reported results for each of the studies held, total compensation for teens and low-skilled workers would still have increased. Any employment or hours reductions would be more than offset by the increase in hourly earnings (Pollin and Wicks-Lim 2005; National Employment Law Project 2012).

Evidence from state and federal minimum wage laws

If the findings of the small number of case studies discussed above are taken on their own, it would be difficult to draw broad conclusions about the impact of minimum wage laws. However, the results from studies of city and county minimum wage laws are corroborated by detailed research on state and federal minimum wage laws that provide a much larger sample of events to study.

Two innovative studies conducted by researchers from UC Berkeley, University of Massachusetts-Amherst, and UNC-Chapel Hill are especially relevant (Dube, Lester and Reich 2010, 2014; Allegretto, Dube, Reich and Zipperer 2013). The researchers looked at every state and federal minimum wage increase in the U.S. between 1990 and 2011 and identified several hundred pairs of adjacent counties that were located on different sides of a state border with a minimum wage difference.

This research design compares the employment trends of the most affected groups—teens and restaurant employees—across adjacent counties that were exposed to different minimum wage levels. It is therefore an excellent test of whether businesses relocate employment outside county borders to avoid being subject

to a higher minimum wage. Using this research design, Dube, Lester and Reich (2010, 2014) and Allegretto, Dube, Reich and Zipperer (2013) find no statistically significant effects of minimum wage increases on either employment or hours in restaurants and other low-wage industries, controlling for a range of regional and local differences that previous research did not include.

Allegretto (2013) uses the same dataset to examine the effects of the subminimum wage for tipped workers (which has remained at \$2.13 an hour at the federal level for more than two decades, but varies significantly across states). Focusing on restaurants, she finds no statistically significant evidence of negative employment effects in states with higher (or no) subminimum wages for tipped workers.

We highlight these studies because they combine state-of-the-art econometric methods with the most detailed datasets available, allowing researchers to accurately control for differences in local economic conditions that could confound the analysis.

That said, the economics literature includes conflicting findings on the employment impacts of the minimum wage. Even if the employment impacts of minimum wage are zero, we would expect to find case studies clustered around that point, with some finding positive and others finding negative impacts (Schmitt 2013). However, most of the broader studies that find negative effects, as reviewed in Neumark and Wascher (2008), fail a fundamental necessary condition for identifying statistically unbiased estimates of minimum wage effects. The key issue is that their research design assumes that states that increase minimum wages are otherwise not different from those that do not increase minimum wages. Dube, Lester and Reich (2010) and Allegretto, Dube, Reich and Zipperer (2013) show that this assumption is incorrect. In the states that increased their minimum wages, employment among low-wage workers was already growing more slowly two years before the implementation of the minimum wage increases, compared to states that did not increase minimum wages. Existing differences in regional employment trends that are unrelated to minimum wage policy can explain the differences in outcomes after the increases. As Allegretto, Dube, Reich and Zipperer (2013) document, local comparisons make sense because nearby areas are much more similar than areas that are farther away. And when minimum wage effects are estimated using local comparisons—such as across adjacent counties on a state border—the negative effect on employment disappears.⁸

Neumark, Salas and Wascher (2014a, b) have defended Neumark and Wascher's earlier findings. Allegretto, Dube, Reich and Zipperer (forthcoming) in turn have responded. Much of the debate concerns the proper control groups to include in a regression. In a new approach, Totty (2014) examines minimum wage effects without prior decisions on what control groups should be included. He finds that local controls should be included and that the minimum wage does not have significant effects on employment.

While this debate will undoubtedly continue, it should be noted that both sides now agree that they find extremely small employment effects of minimum wages in restaurants. Moreover, there are no effects on adults, who make up nearly 90 percent of minimum wage-affected workers nationwide (Aaronson, Agarwal and French 2012, Table A-3).

Belman and Wolfson (2014) provide the most extensive summary of the minimum wage research since Card and Krueger (1995). They conclude that the employment effects of the minimum wage in the United States are “both vanishingly small and not statistically significant in even the most generous test” (p. 168). A separate review of minimum wage research by Schmitt (2013) similarly finds “the minimum wage has little or no discernible effect on the employment prospects of low-wage workers.”

Impact on which workers are hired

In his review of minimum wage research, Schmitt (2013) considers several channels through which employers might adjust to increases in the minimum wage. One possible scenario is that employers will simply switch to hiring more skilled workers, thereby hurting the employment prospects of less educated workers and, in particular, black and Latino teens. Schmitt reviews several studies that have explicitly researched this question, some of which yield conflicting findings. Again, research design matters greatly here, and studies that thoroughly control for regional or local differences do not find evidence of labor substitution. For example, Allegretto, Dube and Reich (2011) examine the impact of the minimum wage on the employment of white, black, and Hispanic teens, covering the period from 1990 to 2009. After improving on previous research by controlling for regional differences, they find no statistically significant negative effects on employment or hours for teens, regardless of race or gender. In their contiguous counties dataset, Dube, Lester and Reich (2014) similarly find no evidence of such substitution by either age or gender.

Automation and substitution away from unskilled labor

It is often argued that a higher minimum wage will lead firms to reduce their use of workers. This reduction in labor demand can occur through two different channels: one involves substituting capital for labor, i.e., automation of jobs while keeping sales at the same level; the other involves needing fewer workers when sales fall as prices increase. We discuss here the automation channel and consider the effect on sales later in this section.

Mechanization does not necessarily lead to a net loss of jobs. As Autor (2014a-b) points out, machines (including smart robots) do not just substitute for labor; they are also complements to existing jobs or lead to the creation of new jobs and industries. Indeed, previous rounds of automation and computerization have created more jobs than they destroyed. Moreover, automation does not only involve the replacement of labor by machines. It also involves the replacement of old machines (think manual cash registers) with newer ones (think electronic cash registers and now iPads).

Aaronson and Phelan (2014) recently studied the short-run impact of minimum wages on the automation of different kinds of jobs in the restaurant industry. Their study is the first to examine Autor's job mechanization hypothesis within a low-wage industry. Just as Autor predicts, Aaronson and Phelan find that minimum wage increases do reduce routinized jobs (such as cashiers) and increase the number of less-routinized jobs (such as food preparation). As it turns out, the changes offset each other almost equally, resulting in no net change in employment. We therefore conclude that the short-run effects of automation are not significant.⁹

Reductions in paid hours relative to working hours

Some commentators assert that a higher minimum wage will lead employers to cheat them of a portion of their wages. It is important to recognize that such practices already exist; the question at hand is how much the minimum wage increase will increase their intensity and prevalence. Although it is difficult to measure changes in wage theft, we know that employee-reported increases in pay (to a census surveyor) after a minimum wage increase match up well to employer-reported increases in pay on administrative reports

that determine payroll taxes (Dube, Lester and Reich 2010). These results suggest that most employers comply about as much after the increase as before.

Impacts on retail businesses

Most of the studies cited above focused on employment in the restaurant industry. The retail industry is the second most intensive user of minimum wage and near-minimum wage workers. A few studies have examined the effects of minimum wages on the retail sector. In her research on the retail industry, Zeynep Ton (2012) finds that highly successful retail chains “not only invest heavily in store employees but also have the lowest prices in their industries, solid financial performance and better customer service than their competitors.” Using *County Business Patterns* data and their border-county pair research design, Dube, Lester and Reich (2010) found no negative effects of minimum wages on retail employment. In a related study, Dube et al. (2006) compared the number of national retailers operating in San Francisco before and after the city minimum wage policy was implemented. They found that the number of top retailers grew, as did the number of stores. Overall retail employment did not decline in San Francisco or Santa Fe, nor did employment in individual retail sectors, such as grocery stores, general merchandise stores, or clothing and accessories.¹⁰

B. Impacts on firms’ costs

The impact of minimum wages on the overall cost structure of a business varies significantly by industry. The impact of the minimum wage on a firm’s operating costs will depend on the share of the workforce at or below the new minimum wage rate, their average wage before the increase, and the share of labor costs in total operating costs. Operating costs include not only labor, but also materials, rent, maintenance, supplies, taxes, utilities, and energy costs. An industry may have large numbers of low-wage workers, but if labor is a relatively small share of the total costs of the firm, the wage increase will have a correspondingly small impact on the overall cost structure of the firm.

In a prospective study of the San Francisco minimum wage, Reich and Laitinen (2003) carried out a representative survey of establishments. They estimated that a 25.9 percent increase in the minimum wage from \$6.75 to \$8.50 would result in a 1.1 percent increase in the overall wage bill. When viewed from the perspective of operating costs, a 26 percent increase would result in 82.0 percent of establishments experiencing an increase in operating costs of less than 1 percent or more, and 95.2 percent experiencing an increase in operating costs of less than 5 percent. Breaking down results by industry, they estimated that 17.9 percent of restaurants would experience an increase in operating costs of 5 percent or more, as would 8.6 percent of retail establishments. For manufacturing, entertainment, hotel, and personal service firms, the estimated increase in operating costs was close to zero.

Pollin (2004) similarly estimated that the average increase in firms’ costs relative to sales under Santa Fe’s 2003 minimum wage ordinance would be 1 percent; the average cost increase for hotels relative to sales would be 3 percent.

Benner and Jayaraman (2012) analyzed the impact of a proposed increase in the federal minimum wage from \$7.25 to \$10.10 (a 39 percent increase, not accounting for inflation during the phase-in) on the food industry. They estimated a maximum increase in operating costs for the food service and drinking establishment industry of 2.25 percent over three years, and 1 percent in the retail food industry.

Reich, Jacobs, Bernhardt and Perry (2015) estimated that increasing the minimum wage in Los Angeles to \$13.25 by 2017 would result in a 0.5 percent increase in operating costs across the economy by 2017. In the food services industry, they found that operating costs would rise by 3.9 percent by 2019, and in the retail industry costs would rise by 0.5 percent.

To put these results in context, consider the following hypothetical example of how a 10 percent increase in the minimum wage might affect costs in the restaurant industry. If one-third of restaurant workers were paid exactly the minimum wage or up to no more than 10 percent above the minimum wage (and if wages were evenly distributed), then these workers would receive a pay increase that would average half of the 10 percent increase in the statutory minimum. The increase in the wage bill would thus be one-third of 5 percent, or 1.67 percent.

Moreover, labor costs comprise about one-third of operating costs in the restaurant industry. A 10 percent increase in the minimum wage would therefore increase operating costs by one-third of 1.67 percent, or 0.56 percent. A larger minimum wage increase would imply a greater increase in costs. In the retail industry, the proportion of low-wage workers is lower than in restaurants; the proportion making exactly the minimum wage is also lower; and labor costs are only about 10 percent of operating costs. So the effect on costs in the retail industry would be even smaller than it is in the restaurant industry. The research results we summarized above are consistent with these hypothetical examples.

C. Impacts on prices

Since a higher minimum wage applies to all employers in the geographic region affected by the policy, a firm that serves the local market, like a restaurant, will be able to pass through a share of the higher costs without suffering a disadvantage relative to its competitors. Belman and Wolfson (2014) survey seven studies of price effects of the minimum wage, all of which found some impacts on prices in industries highly affected by the minimum wage, namely restaurants. Dube, Naidu and Reich (2007) found that restaurant prices in San Francisco rose 2.8 percent more than those in neighboring Alameda County, following the implementation of a 26 percent increase in the city's minimum wage law. Using a very small sample, Hirsch, Kaufman and Zelenska (2011) found that two-thirds of the cost increase for quick serve restaurants in Georgia and Alabama were offset by increases in price. Aaronson (2001) found that a 10 percent increase in the minimum wage results in a 0.7 percent increase in restaurant prices.

Price effects outside the restaurant industry are largely negligible. Benner and Jayaraman (2012) provide estimates of price impacts across industries for a \$10.10 federal minimum wage increase. They estimate that if the entire cost were passed through to prices, restaurant prices would increase 2.5 percent over three years, retail food 1 percent, warehouse and storage and accommodations 0.7 percent, and administrative and support services 0.9 percent. In most other industries, price increases could not be detected.

When these small price increases are considered in the context of who receives the wage increases, research shows a redistribution effect towards lower income families. Jacobs, Graham-Squire and Luce (2011) estimated the impact of a \$12 minimum wage for large retailers on employees and consumers. They found that if the entire cost were passed through to consumers, Walmart would increase prices 1.1 percent. The increased costs would be shared by consumers across the income spectrum, with 28.1 percent borne by shoppers in lower income households. By contrast, they found that the increase in workers' earnings would be large and concentrated, with 41.4 percent going to workers in families with incomes below 200 percent of the federal poverty line.

D. Impact on profits

Previous prospective studies have made different assumptions on how much costs will affect prices—and therefore also profits. Card and Krueger (1995, ch. 10) provide an extensive discussion of this issue. As they point out, from the point of view of an individual employer in a perfectly competitive industry, profits would be unaffected only in the extreme case in which firms can costlessly replace low-wage labor with high-skill labor and/or capital, and without cutting output. Since such substitutions are costly, from this perspective a minimum wage increase would have to reduce profits. Firms do not envision a price increase as a solution, as they fear losing sales to their competitors.

A different result emerges when Card and Krueger consider the point of view of an industry as a whole. This perspective is necessary since the minimum wage increase applies to all the firms in an industry. Now, when individual firms respond to the prospect of reduced profits by raising their prices, they find that other firms are doing the same. Some of the price increases will stick and the industry will recapture some of the reduced profits. However, since demand for the industry's product is not fixed, this increase in price entails some reduction in product demand, implying that industry output (and therefore employment) will fall. In other words, the price increase will permit employers to recover only a portion of their reduced profits.

The above reasoning contains a key assumption: that firms' labor costs consist only of the wages they pay. As Card and Krueger and many other economists (such as Manning 2003, and Ashenfelter, Farber and Ransom 2010) emphasized, the presence of nonwage labor costs—such as the cost of replacing workers who leave—leads to different conclusions. In particular, minimum wage increases may reduce employee turnover costs. As a result, employment declines, price increases, and profit declines will all be moderated. Considerable evidence, moreover, suggests that turnover costs are an important feature of low-wage labor markets.

Aaronson (2001) and Aaronson, French and MacDonald (2008) both find complete pass through of costs in the restaurant industry. However, their data come from a period of much higher inflation, are based on a handful of observations per metro area, and they do not correct their standard errors for clustering. In contrast, Allegretto and Reich (2014) collected a large sample of restaurant price data in and near San Jose, before and after a 25 percent minimum wage increase in 2013 (from \$8.00 to \$10.00). Their preliminary results indicate that most, but not all, of the costs are passed through to consumers in higher prices. Note that since sales fall, it is possible that profits will fall as well.

The evidence on whether profits do fall is extremely scant. The most important study remains Card and Krueger (1995), who obtain mixed results when examining the effects of minimum wage changes on shareholder returns for fast-food restaurant chains. Using British data, Draca et al. (2011) find a small negative effect on profits. However, one segment of this study uses data for firms in the British residential care industry. Firms in this industry were not permitted to increase prices, making the results not very useful for other sectors. Harasztosi and Lindner (2015) examine a large (60 percent) increase in the Hungarian minimum wage, much of which was felt in manufacturing. These authors find that cost increases were entirely passed through, but employment did not change and profits did not fall. However, the relevance of the British and Hungarian studies for the U.S. is highly uncertain.

E. Impact on employee turnover

The correlation between low wages and high employee turnover is well documented (Cotton and Tuttle 1986). In 2011, 37 percent of food service workers and workers in hotels and accommodations voluntarily quit their jobs (Boushey and Glynn 2012). In an extensive study of minimum wage impacts on employment flows, Dube, Lester and Reich (2014) found that a 10 percent increase in the minimum wage results in a 2.1 percent reduction in turnover for restaurant workers and a 2.0 percent reduction in turnover for teens. Dube, Naidu and Reich (2007) found an increase in the average tenure of workers in limited-service restaurants of three and a half months. Brochu and Green (2011) obtained similar results with Canadian data.

Three studies analyzed the impact of living wage laws on employee turnover. A study of the Los Angeles Living Wage Ordinance (Fairris 2005) found a 35 percent reduction in turnover in firms that increased wages as a result of the law, with an average increase of 23 percent. Reich, Hall and Jacobs (2005) found an overall decrease in turnover at the San Francisco International Airport of 60 percent for firms that were highly impacted by mandated pay increases. Turnover of airport screeners fell by 80 percent following a 55 percent wage increase, from \$5.75 to \$10 per hour. Howes (2005) found a 17 percent decrease in turnover following a 13 percent wage increase for homecare workers in San Francisco. Putting the living wage studies together, Jacobs and Graham-Squire (2010) estimate that for every 1 percent increase in wages in low-wage service positions, turnover declines by an average of 1.45 percent. The impact may be smaller for broad minimum wage laws where all employers in a market increase their wages at the same time and the wage difference between firms remains the same (Manning 2011).

Employers incur significant costs from employee turnover. This includes both direct costs for recruitment, selection, and training of workers and the indirect costs associated with lost sales, poor customer relations, and lost productivity as new workers learn on the job. The cost of worker replacement varies based on compensation, firm size, and skill level of the job. Hinkin and Tracey (2000) conducted a detailed study of non-managerial staff at four hotels, two in Boston and two in Chicago. Taking into account both direct and indirect costs, they estimated replacement costs ranging from \$1,322 for room service wait staff and \$2,077 for a line cook to \$7,658 for an administrative assistant in sales and catering. A study of the cost of supermarket turnover by the Coca Cola Research Council estimated the replacement cost for an \$8 an hour non-union worker at \$4,199 (Blake 2000). Boushey and Glynn (2012) find that the median cost of replacement for jobs paying \$30,000 a year or less is 16.1 percent of an employee's annual salary. A statistical analysis of California businesses by Dube, Freeman and Reich (2010) obtained similar results. Jacobs and Graham-Squire (2010) estimate that 18 percent of the costs of a wage increase for school cafeteria workers would be offset by lower turnover costs.

F. Impacts on firms' operations and productivity

A higher minimum wage may reduce costs through additional channels that improve firm performance. In a small case study of quick service restaurants in Georgia and Alabama, Hirsch, Kaufman and Zelenska (2011) suggest how firms adjust to higher wage mandates. These authors analyzed detailed payroll data and also surveyed managers and employees about human resource practices. The authors found no negative effect from the minimum wage increase on employment or hours worked. Managers reported they could offset 23 percent of the labor cost increase through operational efficiencies. Ninety percent of the employers reported they had or would increase performance standards, including requiring better

attendance, requiring more proficient and faster performance of job duties, having workers take on additional tasks, and more quickly terminating workers who were not performing. Managers reported economizing on non-labor inputs, including water, electricity, and food wastage.

Reich, Hall and Jacobs (2005) surveyed employers and employees at the San Francisco International Airport following the implementation of higher mandated compensation standards. Employers reported improvements in overall work performance (35%), employee morale (47%), absenteeism (29%), reductions in grievances (45%), reductions in disciplinary issues (44%), improvements in equipment maintenance (29%), reductions in equipment damage (24%), and improvements in customer service (45%). Employees reported that more skills were required of them (50%), that they were working harder on the job (44%), that they were experiencing greater stress on the job (43%), and that the pace of work had increased (37%).

Reduced employee turnover means that workers will have more tenure with the same employer, which creates incentives for both employers and workers to increase training and therefore worker productivity. A large scholarly literature makes this point, and it has been emphasized recently by firms such as Walmart, TJ Maxx, and Gap as principal reasons underlying their announced policies to increase their minimum wages nationally to \$10.00. However, because of the lack of data on individual productivity, the literature does not provide a quantitative assessment of the importance of the effect on productivity.

H. Impacts on health benefits and pensions

If employers are required to increase their wages, they may compensate by reducing other benefits. For this reason, some of the local minimum wage laws count contributions towards health care towards meeting the minimum compensation requirement. Schmitt (2013) summarizes the empirical research, finding “small or no effects along these lines,” either on the receipt of health insurance, on provision of family health insurance, or whether or not the employer paid the full premium. Dube, Naidu and Reich (2007) did not detect any decrease in the provision of health benefits in restaurants in San Francisco.¹¹ Belman and Wolfson’s (2014) detailed survey of minimum wage research found that the evidence of impacts on benefits was “thin,” and that any effect on health insurance provision was concentrated in smaller firms. They find no impact on employer-provided pensions, which is not surprising given that this benefit is rare among low-wage workers. Since the provision of employment-based health benefits is closely correlated with wages, effects could be larger at higher minimum wage rates.

4. The effects of minimum wage laws on the local economy

A common question is whether raising the minimum wage might act as an economic stimulus and engine of job growth, as low-wage workers spend their increased earnings in local communities. As discussed above, higher wages are absorbed by employers through a variety of channels, including lower turnover and increases in price. Higher prices will in turn reduce consumer demand for goods and services. At the same time, low-wage workers and their families are likely to spend a significant portion of their increased earnings from a minimum wage increase (Johnson, Parker and Soueles 2004), which increases demand for goods and services.

Researchers at the Federal Reserve Bank of Chicago analyzed how a future federal minimum wage increase would affect aggregate household spending (Aaronson and French 2013). The authors calculate that

a \$1.75 increase in the federal minimum wage (from \$7.25 to \$9.00 an hour) would raise aggregate household spending by roughly \$48 billion in the short term, increasing GDP by 0.3 percent. In a similar vein, the Economic Policy Institute recently estimated that the Harkin/Miller bill would result in an additional \$35 billion in wages paid to affected workers by 2016. This projected rise in consumer spending would provide a net increase in GDP of \$22.1 billion, creating roughly 85,000 new jobs (Cooper 2013).

For local laws, the size of the locality and the proportion of workers who live and spend their income in the locality are also important. Reich, Jacobs, Bernhardt and Perry (2015) modelled the interaction between higher prices and higher wages on consumer demand in a prospective minimum wage study for the city of Los Angeles. They found that on balance, the reduction in consumer demand from higher prices was offset by the increased purchasing power of low-wage workers receiving the pay increase. However, since not everyone employed within the city also lives within the city, some of the increased demand is spread to surrounding areas. As a result, they found the law would lead to a small net reduction in consumer demand and employment within the city of Los Angeles and a small net positive increase in employment in the county as a whole.

Since low-wage workers tend to live in lower-income neighborhoods, businesses in those neighborhoods will disproportionately benefit from the increase in worker spending.

Border effects

Will higher local minimum wages lead to firms relocating outside the city? Most economic activity in the U.S. is concentrated in urban areas, where wages are higher. Despite higher wages—and much higher real estate prices—firms want to locate in cities. They seek the advantages of being near other firms in their industry, the market for their products, and sources of raw materials, transshipment points, and labor. The firms that locate in urban areas thus already are paying a premium. Of course, at the periphery of urban areas real estate prices are lower, creating an advantage that gets balanced against the benefits of being closer to customers and to other firms.

Previous research suggests that business relocations are determined more by real estate prices and access to consumer markets than by differences in labor costs (Kolko and Neumark 2007). Wages are also likely to rise just outside of a higher minimum wage city as businesses there will want to hold on to their workforce.

Jekanowski et al. (2001) find that convenience and accessibility are the prime determinants of fast-food restaurant location decisions. The best recent evidence comes from Colbion et al. (2015), who examined sales and price data for 31 identical products from hundreds of retail stores in 50 metro areas. These authors document substantial store-based differences in prices for the same exact product, even within the same metro area. The persistence in price differences, even among nearby stores, indicates the presence of geographic frictions in consumer markets. In other words, small price differences did not lead consumers to switch to lower-price stores.

On the other hand, the same study also found that consumers switch to low-price outlets when local unemployment rates increase, in part because the cost of time for unemployed shoppers is much lower than for shoppers as a whole. This evidence thus also indicates that spatial price differences, although not decisive for shoppers, are not completely irrelevant either. Not surprisingly, much depends on the size

of the price differences. A number of studies have focused on the implied travel costs for consumers in deciding where to shop. Gopinath et al. (2011) estimate that such costs might be about \$1.70 per mile (round-trip) for retail. Thomadsen (2005) collected data on prices, locations, and attributes of every Burger King and McDonald's outlet in Santa Clara County and estimate a travel cost of \$3 per (round-trip) mile. Implied travel costs of this magnitude make it unlikely that fast-food restaurants would want to move away from their own customer base.

5. Conclusion

In 1994 David Card and Alan Krueger published a groundbreaking study that changed how economists view the minimum wage. Card and Krueger looked at employment in fast-food restaurants across the New Jersey and Pennsylvania border after New Jersey increased its state minimum wage. They found no measurable negative impact on employment. As we reviewed above, a large body of research has since built upon their methodology. As a result, we have learned a great deal about how employers respond to increases in the minimum wage.

First, paying workers more can change their work performance. It can change their productivity, their attitude about their job, how hard they work, and their ability to make it to the job on time. Second, low-wage labor markets have high levels of job churning. Turnover levels are high as workers leave jobs looking for better wages or because they are unable to stay in their jobs due to poverty-related problems such as difficulties with transportation, child care, or health. As a result, rather than eliminating jobs, raising the minimum wages can reduce turnover and increase job stability. Third, firms can absorb higher labor costs through other means as well. They can pass on some of the increased costs to consumers through higher prices or earn lower profits. In short, firms use a combination of strategies to adjust to higher minimum wages without cutting jobs or hours (Schmitt 2013).

Nonetheless, it is important to emphasize again that the existing research literature is necessarily limited to the range of minimum wage increases that have been actually been implemented. While these studies are suggestive, they cannot tell us what might occur when minimum wages are increased significantly beyond past local, state, or federal mandates. Prospective economic modeling as done by Reich, Jacobs, Bernhardt and Perry (2015) suggests that the benefits to low-wage workers of the higher minimum wage laws passed in cities like Seattle, Los Angeles and San Francisco would outweigh the costs.

Finally, raising the minimum wage is not a cure-all, especially in the face of larger forces generating inequality that require national attention. Still, our assessment of the research evidence is that these policies have worked as intended in raising the incomes of low-wage workers and their families.

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Endnotes

¹ This section draws on material presented in Reich, Jacobs and Bernhardt (2014) and Reich et al. (2015).

² The authors also examined the impact of the 1993 minimum wage law in Washington DC, but found that the size of the increase was too small to raise wages in those industries (too few workers were affected). They conclude that the law therefore did not constitute a meaningful policy experiment.

³ Several studies have examined the relationship between the minimum wage and the Earned Income Tax Credit, or EITC. Neumark and Wascher (2011) find that a higher minimum wage increases EITC benefits for families in deep poverty, while reducing EITC benefits for some subgroups. Lee and Saez (2012) argue that the minimum wage and EITC are complementary policies, not substitutes. The Congressional Budget Office (2014) argues that a minimum wage increase will not have a substantial effect on EITC spending, while Rothstein (2010) examines whether the positive effect of the EITC on female labor supply has lowered wages. While these studies are of interest, the EITC is quite different from programs such as food stamps. The EITC has a substantial phase-in period during which benefits increase and a long phase-out period, with eligibility ending completely at an annual income of about \$48,000 for a family of four—quite a bit above the reach of the minimum wage.

⁴ Albuquerque did not have a city minimum wage law at that time.

⁵ In Santa Fe, net store closings were 1.1 percent higher in businesses covered by the law than among those that were not. This difference was not statistically significant.

⁶ The authors also examined the impact of the 1993 minimum wage law in Washington DC, but found that the size of the increase was too small to raise wages in those industries (too few workers were impacted). They conclude that the law therefore does not constitute a meaningful policy experiment.

⁷ Detailed critiques of the studies were made by Pollin and Wicks-Lim (2005) and the National Employment Law Project (2012). Among other issues, the data used in the San Francisco study starts one year after the law was implemented and fails to capture pre-trends or the first year of implementation. The study compares San Francisco to 20 other “superstar” cities. As with Neumark and Wascher (2008), the results may be biased by underlying regional differences that are unrelated to minimum wage policies. Colla, Dow and Dube (2014) solve this problem by comparing trends in earnings and employment between a similar group of central cities and their peripheral counties from 2002 to 2010. They find no evidence that increasing the minimum compensation standard led to a decrease in employment in San Francisco.

⁸ A recent report by the Congressional Budget Office (2014) projects that a \$10.10 national minimum wage would raise wages for 16 million Americans, lift 900,000 out of poverty, and result in a reduction in jobs of 500,000. The report claims to synthesize recent research on teen employment, but it does so without making adjustments for research quality. The CBO’s estimated elasticity for adult employment is unsupported by the recent empirical research, including that of Neumark and Wascher (2008), which found no measurable employment impact for adults.

⁹ Long-run effects might be different. However, Dube, Lester and Reich (2010) do not detect any negative employment effects as long as four years after a minimum wage is implemented.

¹⁰ However, data were not available for comparisons to areas not covered by the minimum wage policy.

¹¹ Their surveys were carried out sufficiently prior to San Francisco’s proposal to establish an employer minimum health spending requirement to avoid any contamination of the results.

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