Evaluation of a Minimum Wage Increase in Minneapolis and Hennepin/Ramsey County

Technical Report

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KEY FINDINGS

The Roy Wilkins Center replicated the techniques used in prevalent economic literature to simulate the relative impact of a local minimum wage increase in the city of Minneapolis and in Hennepin/Ramsey County. These simulated minimum wage changes are at the $12 and $15 per hour levels. The research team finds the following:

Simulated Results in 2021 (After Full Implementation of Minimum Wage)

Industry	Minneapolis				Hennepin/Ramsey			
	$12		$15		$12		$15	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Restaurants								
Total Employment	-1.85% -	0% *	-3.35% -	0% *	-1.85% -	1.88%	-3.35% -	3.44%
Total Employee Earnings	0% * -	14.58%	0% * -	27.72%	0% * -	16.24%	0% * -	31.03%
Retail								
Total Employment	-1.24% -	0% *	-2.24% -	0% *	-1.24% -	1.25%	-2.24% -	2.28%
Total Employee Earnings	0.00% -	7.16%	0% * -	13.31%	0% * -	13.47%	0% * -	25.51%
Health								
Total Employment	0% * -	0% *	0% * -	0% *	0% * -	0% *	0% * -	0% *
Total Employee Earnings	0% * -	7.66%	0% * -	14.26%	0% * -	19.32%	0% * -	37.21%

Total Employee earnings reflect geographic area's change in employee earnings
Total Employment reflects geographic area's change in total employed persons
*A rate of 0% suggests there is no statistically significant response to the proposed minimum wage
See Table 43–47 for more detailed summary of results

- The industries with the largest number of persons likely to be affected by the change in minimum wage are food service, retail, non-hospital health, and administrative support
  - The administrative support sector is larger than the other sectors. While a larger number of administrative support workers are likely be affected by a change in the minimum wage, the percentage who are likely to be affected is comparatively small to the other industries
    - This does not reflect that this sector is more likely to pay minimum wages
    - Because administrative support workers are not as *proportionally* likely to be affected by the simulated minimum wage increase, analysis is more detailed for the other three industries. Therefore, a separate model was not created

- Minimum wage earners in Minneapolis often
  - Have at least some college education
  - Are not currently in school
  - Work at least 35 hours per week
  - Are over age 25
- Firms that currently pay the $9.50 minimum wage in Minneapolis often
  - Are eligible to pay the current lower minimum wage of $7.75 as a small business
  - Will increase prices of food by less than 5% to cover labor costs of a $12/$15 minimum wage
  - Face lower employee turnover after an increase in the minimum wage
- Current literature on the minimum wage suggests
  - Increases in average employee monthly earnings vary by industry
  - Average employee monthly earnings in the Minneapolis metropolitan area are more sensitive to the minimum wage than the country as a whole
  - Most estimates of the change in workforce participation find no statistically significant change after a minimum wage increase
- Households with minimum wage earners in Minneapolis
  - Are currently less likely than the general public to meet their food needs
  - Are likely to spend $27 more a week to meet their food needs after the proposed increase in the minimum wage
  - Would face food insecurity 4-7% less often under the proposed policy
- Immigrant workers earning the minimum wage in Minneapolis
  - Are slightly more responsive to an increase in the minimum wage than the general population
  - Are especially more responsive to an increase in the minimum wage if they are recent immigrants in a low skill job
- Nonwhite employees are more likely to be affected by an increase in the minimum wage than white workers, when controlling for the number of workers in each group
  - Minority Owned Business Enterprises are, however, likely to face smaller changes in payroll costs after a change in the minimum wage, as fewer minority owned enterprises qualify to pay their workers a reduced minimum wage
- Firms within industries with relatively few minimum wage workers are not very likely to see a large change in their operating costs as a result of the proposed minimum wage
- Firms within industries with relatively many minimum wage workers may see an increase in their operating costs, however, if employee earnings increase by a smaller rate than we simulate, the change in labor cost would be smaller as well

- Many firms, notably in the restaurant industry, may pass on the increased labor cost of a minimum wage increase to consumers by charging higher prices for their goods. Because this cost can be spread out over all consumers, the change in prices is relatively small, averaging less than 5% increase in restaurant prices
- Much of the existing literature on the minimum wage relies on either national estimates, or large regional estimates
  - Because this report simulates a citywide minimum wage, which is much smaller in terms of population, the expected change in earnings or employment resulting from a change in the minimum wage is more difficult to determine, and the range of likely outcomes is wider
  - Many estimates of the range of likely outcomes are so wide, that they include the possibility of a 0% change in employment levels or in employee earnings. This variability could also imply that changes in earnings and employment are likely to result from factors other than the minimum wage.

Clarifications

- A change in employment levels do not necessarily translate to a change in the number of new hires, but the number of positions filled
  - Firms may choose to cease filling vacancies rather than fire employees
  - Employment levels in these studies reflect the total number of employed persons, and do not reflect the employment rate, or people who are looking for work
  - This analysis does not simulate the effects of a change in the minimum wage for persons who are not in the workforce
  - If a model simulates a change in an industry's employment level, it is possible that the change indicates people leaving/entering one industry while continuing to work in another industry
  - The Roy Wilkins Center estimates the change in the number of persons employed in an industry, this does NOT imply that EACH worker faces the same job responsibilities that they had before
    - Likewise, one laborer might be replaced with another laborer
- A change in employee income reflects a change in pre-tax earnings, often for three month increments
  - Earnings in this case would equal the hourly wage rate, multiplied by the number of hours worked in a week, multiplied by the number of weeks worked in three months
    - There is no way to clarify if a change in employee earnings results from a change in the hourly wage, the number of hours worked in a week, or the number of weeks worked, or a combination of the three

  - The Roy Wilkins Center estimates the average change in earned income, this does NOT imply that EACH worker sees an increase in earnings after a change in the minimum wage
- A change in employee turnover reflects the change in the number of employees who leave or join a firm where they were not previously employed
  - It is also possible that a change in turnover in an industry might be a result of more/fewer new workers hired, more/fewer workers separated from the firm, or a combination of the two
- Because employment data is collected from the employee, there is no way to measure if a firm relocates with this data, or if they are replaced with another firm

INTRODUCTION

In October 2015, the City of Minneapolis Department of Community Planning and Economic Development issued a request for proposals to research and simulate the change in workforce participation, the change in worker earnings, and possible unintended consequences for establishing a $12 per hour and a $15 per hour minimum wage the city of Minneapolis, and for Hennepin/Ramsey County.

The Roy Wilkins Center (RWC) examined peer reviewed literature on the topic of changes in the minimum wage, and reviewed best practices and enforcement strategies employed by the relevant localities. The research team projected the establishment of the local minimum wage at the same rate as the state minimum wage, and then increases incrementally over the next five years.

The Roy Wilkins Center simulations included many models that are similar but have slight differences in methodology. In the technical report, the research team included additional analysis for immigrant workers, impacts of the minimum wage on employee turnover, analysis of households' ability to cover monthly expenses, analysis of changes in industry payroll costs, and a scaling of the impacts to the relative change in the minimum wage proposed. Moreover, the research team included estimations for the changes in employment and average earnings for a minimum wage increase for Hennepin/Ramsey County.

SCOPE OF THE ANALYSIS

The purpose of this analysis is to provide a review of literature on the topic of a minimum wage and use the literature as a guide to simulate the impacts of a local minimum wage in the city of Minneapolis, and in Hennepin/Ramsey County. It is not the purview of this analysis to endorse or reject the simulated minimum wages, only to reflect the relative impacts the simulations reveal given the proposed minimum wage.

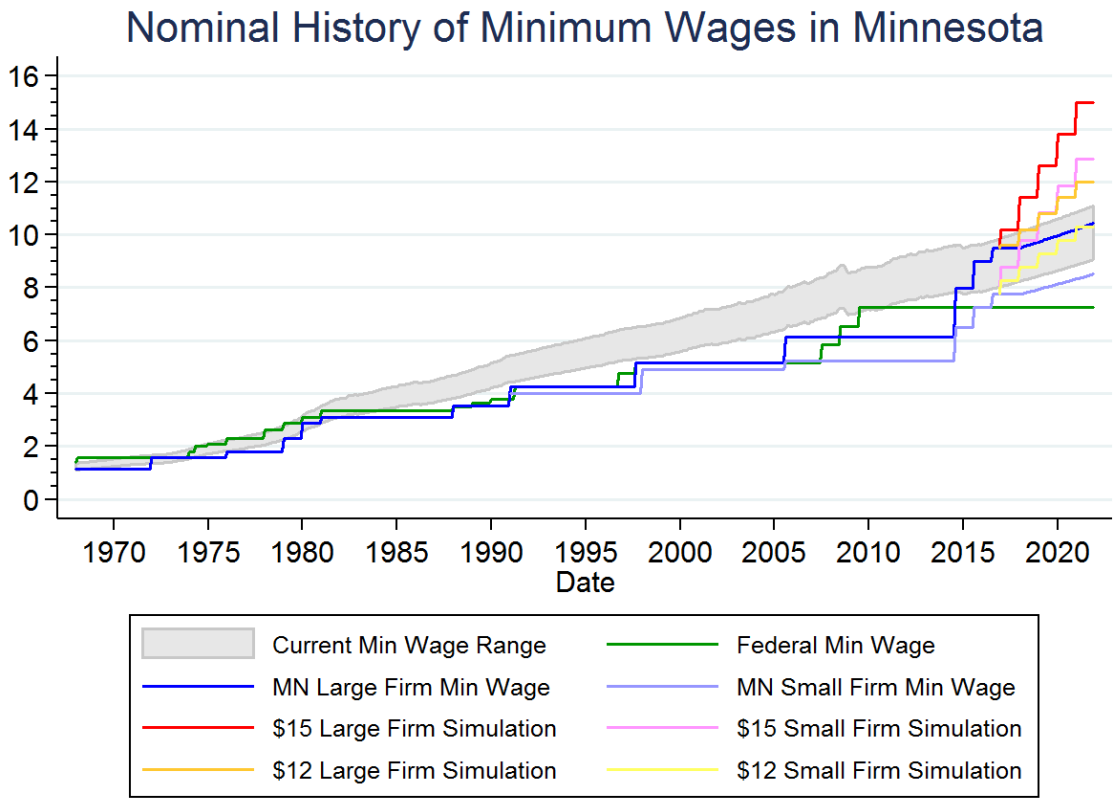
This analysis begins by providing context for an increase in the minimum wage by identifying

- What is the current context for the minimum wage in the Minneapolis metropolitan area?
- Who earns the minimum wage?
- Which industries are most likely to be sensitive to the proposed minimum wage?
- What is the best projection of the change in average monthly earnings in selected industries after the proposed minimum wage?
- What is the best projection of the change in workforce participation in selected industries after the proposed minimum wage?
- What populations are most sensitive to changes in the minimum wage?
- How might the Twin Cities region be influenced by a change in the minimum wage?
- What methods have other localities used to enforce a minimum wage?
- What indirect effects might the Minneapolis metropolitan area see after the proposed minimum wage?

In order to address these questions, the research team relies on a review of literature on the subject of the minimum wage. The research team replicates the original authors' methods and applies the findings to the proposed minimum wage. The research team also reviews the robustness tests from the same authors to address the reliability of their models.

HISTORY OF THE MINIMUM WAGE IN MINNESOTA

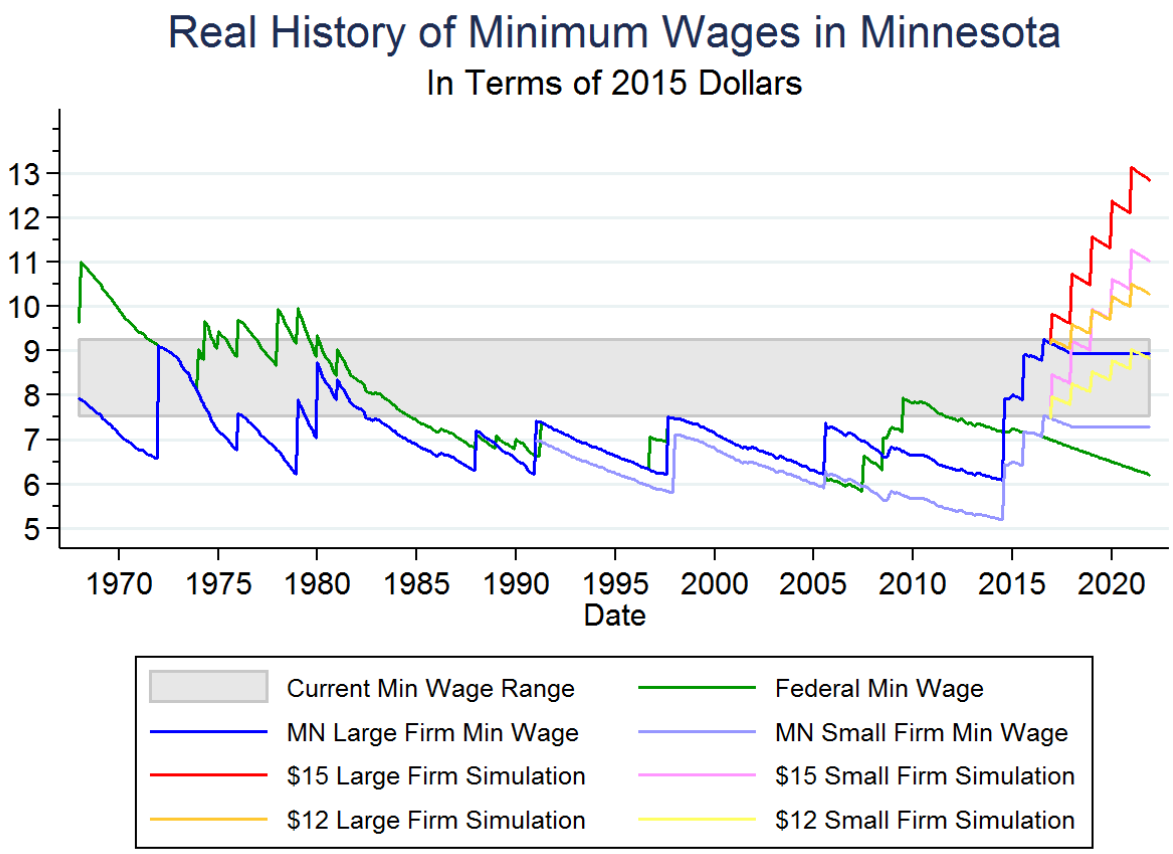
Figure 1



Federal minimum wage and CPI history from Federal Reserve Bank of St Louis and US Bureau of Labor and Statistics, retrieved from FRED June, 2016. Minnesota minimum wage history from Minnesota Department of Labor and Industry. CPI from after 2015 estimated from Congressional Budget Office at a rate of 0.2% per month, compounding to 2.4% annual inflation

The state of Minnesota currently has a two-tiered minimum wage system, where "small" employers earning under $500,000 in gross sales receipts are eligible to pay $7.75 per hour instead of the headline minimum wage of $9.50 per hour that "large" employers with larger sales must pay. This system is similar to the federal Fair Labor Standards Act, wherein currently firms what have an annual sales volume of at least $500,000 shall pay $7.25 per hour. At the end of 2017, the Minnesota minimum wage is scheduled to index to inflation to account for changes in consumer prices over time.

Figure 2



Federal minimum wage and CPI history from Federal Reserve Bank of St Louis and US Bureau of Labor and Statistics, retrieved from FRED June, 2016. Minnesota minimum wage history from Minnesota Department of Labor and Industry. CPI from after 2015 estimated from Congressional Budget Office at a rate of 0.2% per month, compounding to 2.4% annual inflation

If an employer earns more than $500,000 a year in gross sales receipts, then they must pay their employees at least $9.50 an hour. In figures 1 and 2, this "large firm" minimum wage is represented by the dark blue line. If an employer earns less than $500,000 in gross sales receipts, they must pay their employees $7.75 an hour or more. In figures 1 and 2, this "small firm" minimum wage is represented by the light blue line. The current statewide minimum wage is schedules to index to inflation, at the beginning of 2018. This simulation assumes that the growth rate of this indexed minimum wage at the state level will be the same as the Congressional Budget

Office's estimation for changes in the Consumer Price Index. There are some special exemptions to these minimum wages for employees with a J-1 visa, and for workers with a disability, however these exemptions reflect a relatively small share of the workforce. The federal minimum wage follows a similar designation for firms but requires large employers pay at least $7.25 an hour. In figures 1 and 2, this federal minimum wage is represented with a green line. The research team assumes no new federal minimum wage policy.

Figure 1 represents the change in the minimum wage in nominal terms, reflecting what the wage rate was or will be in a given year. Figure 2 represents the same changes in the minimum wage, but indexed for inflation to represent their relative purchasing power in 2015. In figure 2, the minimum wage is scaled according to the Consumer Price Index (CPI) for a given year. This means that the minimum wage represented in figure 2 is the minimum wage rate for a given year in terms of its purchasing power in 2015. In order to show the value of the current minimum wage over time, figures 1 and 2 include a grey region that reflects the value of the current minimum wage in 2015 dollars over time according to large employers and small employers in Minnesota.

In order to simulate the $15 minimum wage, the research team models an incremental change in the large employer minimum wage at the beginning of each year until it reaches $15 in 2021. In figures 1 and 2, this is represented by the bright red line. The reason that this bright red line does not reach $15 in 2021 in figure 2 is because in the time it takes the minimum wage to reach $15, some of the value of that minimum wage is reduced due to projected changes in the Consumer Price Index. Because this simulation relies on percentage changes in the minimum wage, the research team also includes a proportionally similar change in the minimum wage for small employers, which is represented by the pink line. In order to maintain the same proportion

between the “large” and “small” employers, the small employer minimum wage is simulated as 82% of the large employer minimum wage for that year, peaking at $12.24 in 2021.

In order to simulate the $12 minimum wage, the research team models an incremental change in the “large employer” minimum wage at the beginning of each year until it reaches $12 in 2021. In figures 1 and 2, this is represented by the orange line. Maintaining an 82% proportion between the small and large employer minimum wages, the simulated small employer minimum wage reaches $9.79 in 2021 and is represented by the yellow line

In nominal or real terms, a $15 minimum wage will be larger than any minimum wage Minnesota has enforced previously. Upon indexing the changes in the minimum wage to inflation, the simulated $12 citywide minimum wage is comparable to the federal minimum wage paid in the late 1960s. If there is neither a $12 nor a $15 minimum wage, small employers in 2021 will face a similar minimum wage as the one paid in 2005 even though the state minimum wage is set to index to inflation. For a $12 minimum wage, small employers in 2021 would face a similar minimum wage as the federal minimum wage in 1980. Finally, if there are no changes in the federal minimum wage, because the federal minimum wage is not indexed to inflation, the power of the federal minimum wage will approach its historic low by 2021, however, because the statewide minimum wage is currently scheduled to be larger, Minnesota workers are unlikely to directly observe this federal rate.

How the History of the Minimum Wage Influences the RWC Simulation

Because the RWC relies on existing studies to measure the impact of a change in the minimum wage, all simulations are going to implicitly assume that the distribution of firms paying the “large firm” minimum wage and the “small firm” minimum wage does not change over time. The Roy Wilkins Center finds that many of the firms in Minnesota are eligible to pay the “small firm”

minimum wage if they choose. To clarify, firms *may* choose to pay more in order to attract workers who would consider working for a "large firm." Although the large employer minimum wage is the primary wage that is studied in current literature, this simulation will include an implied increase for the minimum wage small employers must pay. The implied increase maintains the same ratio of small to large employer wage rates (currently $7.75 / $9.50, or 82%). The research team also assumes that the portion of workers whose employers are eligible for the small firm rate does not change over time. For a more detailed analysis of the "large" and "small" firms in Minnesota, Minneapolis, and the Hennepin/Ramsey County area, see the section of this report titled "Firm Size in Minneapolis."

Minimum Wage and the Fair Labor Standards Act

In 1974, Minnesota had a four-tiered minimum wage based on the age of the worker and on whether the worker received tips. These rates increased incrementally until 1988, until amendments to the Fair Labor Standard Act (FLSA) determined a new wage floor for employers covered under the FLSA. After 1988, Minnesota discontinued the exemption for tipped workers, maintaining only a tiered minimum wage based on age and on FLSA coverage. In 1990, Minnesota discontinued the exemption for teen workers, but established a new exemption for small employers. Employer size was based on annual gross sales of the employer. Although the threshold for distinguishing employer size has fluctuated over the years, a size exemption is still in place today. Although there has not been a new tier of the minimum wage for teen workers, there has been a temporary 90-day training period wage for teenagers. Finally, there is a tier to the minimum wage for workers that are in select industries and are employed under a J-1 working visa.

Table 1 - History of the Minimum Wage in Minnesota

MINNESOTA MINIMUM WAGE HISTORY

Dates	Adults*		Minors*		Tipped Employees		Minimum hourly rate after credit	
	Federal Covered	State Covered	Federal Covered	State Covered	Minimum tips per month	Max Credit	Adults	Minors
01/01/74 - 09/30/76		$1.80		$1.62	$20.00	25%	$1.35	$1.22
10/01/76 – 09/14/77		$2.10		$1.89	$20.00	25%	$1.58	$1.42
09/15/77 – 12/31/77		$2.30		$2.07	$35.00	20%	$1.84	$1.66
01/01/80 – 12/31/80		$2.90		$2.61	$35.00	20%	$2.32	$2.09
01/01/81 – 12/31/81		$3.10		$2.79	$35.00	20%	$2.48	$2.23
01/01/82 – 12/31/84		$3.35		$3.02	$35.00	20%	$2.68	$2.42
01/01/85 – 12/31/85		$3.35		$3.02	$35.00	15%	$2.85	$2.57
01/01/86 – 12/31/86		$3.35		$3.02	$35.00	10%	$3.01	$2.72
01/01/87 – 12/31/87		$3.35		$3.02	$35.00	5%	$3.18	$2.87
01/01/88 – 12/31/88	$3.55	$3.50	$3.20	$3.15	$35.00		$3.35	$3.02
01/01/89 – 12/31/89	$.3.85	$3.65	$3.47	$3.29	*Adults are those employees 18 years or older.			
01/01/90 – 12/31/90	$3.95	$3.80	$3.56	$3.42	*Minors are those employees under the age of 18.			
	**Large Employer	Small Employer						
01/01/91 – 08/31/97	$4.25	$4.00	** Large employer is defined as any enterprise whose annual gross volume of sales made or business done is not less than $362,500.					
	*** Large Employer	****Small Employer	***Large employer is defined as any enterprise whose annual gross volume of sales made or business done is not less than $500,000.					
09/01/97 Undetermined	$5.15	$4.00	****Effective January 1, 1998 every small employer must pay each employee at a rate of at least $4.90 an hour.					
01/01/98	$5.15	$4.90						

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	**Large Employer	***Small Employer	
08/01/2005	$6.15	$5.25 Training Wage $4.90	**Large Employer is defined as any enterprise whose annual gross volume of sales made or business done is not less than $625,000 ***Small Employer is defined as any enterprise whose annual gross volume of sales made or business done is less than $625,000 ***Effective August 1, 2005 every small employer must pay each employee, including minors under the age of 20, at a rate of at least $4.90 an hour

	**Large Employer (State)	*Federally Covered	***Small Employer (State)	*Federally Covered Enterprise Coverage: Enterprises grossing $500,000 or more annually Individual Coverage: Individual employee engaged in interstate commerce as defined by Federal law (regardless of size of business). 29 USC 8, sec. 206-207.
07/24/2007	$6.15	$5.85	$5.25	Federal minimum wage surpasses State small employer minimum wage.
07/24/2008	$6.15	$6.55	$5.25	Federal minimum wage surpasses State minimum wage for large employers. Most employers must pay Federal minimum wage (plus tips - no tip credit allowed against the state or Federal minimum wage in Minnesota).
07/24/2009	$6.15	$7.25	$5.25	

	**Large Employer	***Small Employer / Training Wage / Youth Wage	Training wage is the wage that can be paid to individuals under age 20 for the first 90 consecutive days of their employment. Youth wage is the wage that can be paid to minors under 18 years of age.
8/1/2014	$8.00	$6.50	**Large Employer is defined as any enterprise whose annual gross volume of sales made or business done is not less than $500,000 ***Small Employer is defined as any enterprise whose annual gross volume of sales made or business done is less than $500,000
8/1/2015	$9.00	$7.25	
8/1/2016	$9.50	$7.75	
1/1/2018	Scheduled increase tied to inflation	Scheduled increase tied to inflation	**Inflation measured by the implicit price deflator, national data for personal consumption expenditures.** **The minimum wage rates in paragraphs (b), (c), (d), and (e) are increased by the lesser of: (1)**

			2.5 percent, rounded to the nearest cent; or (2) the percentage calculated by the commissioner, rounded to the nearest cent. A minimum wage rate shall not be reduced under this paragraph. The new minimum wage rates determined under this paragraph take effect on the next January 1.

ECONOMIC POLICY INSTUTUTE SIMULATIONS

Introduction

The Economic Policy Institute (EPI) is a policy research group in Washington D.C. with thirty years of experience providing context for economic policy discussions, with a focus on policies that affect low and middle income families. The goal of the simulations produced by EPI for this report is to provide context for the simulated minimum wage. EPI produced two products for this report, a descriptive analysis, which details demographic and economic distributions of Minneapolis workers who would be affected by the proposed minimum wage, and an analysis of the ability of families in Minneapolis to meet their needs.

Methodology

Methodology of Minneapolis minimum wage simulation and Family Budget assessment Prepared by David Cooper, Senior Economic Analyst, Economic Policy Institute for the Roy Wilkins Center

Data

The analysis makes use of 5 years of microdata from the 2010 to 2014 American Community Survey (ACS) published by the U.S. Census Bureau, and harmonized by Minnesota Population Center at the University of Minnesota (Ruggles, et.al.) The ACS is the largest annual survey conducted by the Census Bureau, interviewing more than 2.3 million households throughout the United States. The survey measures a host of demographic, social, and economic characteristics of the U.S. population, and was created to replace the long-form version of the decennial census.

The large size of the ACS sample makes it ideal for studying state and sub-state areas. In addition, because the ACS is the only major public statistical survey containing information on individuals' place of work—as opposed to simply recording respondents' place of residence—it is ideal for assessing changes in local labor policies.

The full sample or universe includes all households containing at least one individual who works within the city of Minneapolis. Statistics on the workforce are limited to individuals ages 16 or older who are employed, but not self-employed, in the city of Minneapolis and for whom EPI can impute a plausible hourly wage. The following sections provide details on the geographic identification of Minneapolis workers, the process for wage imputation, the modeling of minimum wage increases, and the expected change in operating costs for affected industries. The last section describes EPI's family budget calculator and our assessment of income adequacy in Minneapolis using the family budget calculator.

Identifying Minneapolis Workers

The smallest geographic unit in the ACS is the Public Use Microdata Area (PUMA), which describes an area of at least 100,000 residents within a state. PUMA lines are drawn by each state. They sometimes correspond to current geographic boundaries—such as counties—although not always. The ACS is one of few surveys (and may be the only nationally-representative one), which identifies respondents' place of residence and their place of work. Place-of-work PUMAs are often aggregations of the place-of-residence PUMAs.

For ACS data years 2010 and 2011, the place-of-work PUMA variable uniquely identifies the city of Minneapolis. For data years 2012-2014, some of the place-of-work PUMAs that cover Minneapolis also include areas of Hennepin County outside of Minneapolis city, making it impossible to isolate workers only in Minneapolis city. Thus, for these years, EPI must use a

regression model to assess the likelihood that workers in these PUMAs are working in Minneapolis city and assign observations to the city to match published workforce counts. EPI created a model using the 2010 and 2011 ACS data—in which the research team knows whether someone actually works in Minneapolis city—to establish parameters that predict whether someone working somewhere in Hennepin County works within Minneapolis city. The model controls for age (to the quartic), gender, race, marital status, education, work hours, mode of commute, industry, occupation, and earnings. The parameters from this model are then applied to the 2012-2014 data to identify workers in Hennepin County likely to be working in Minneapolis city.

EPI tested the accuracy of our model-driven place-of-work identification and found that it accurately predicts place of work in Minneapolis city among all Hennepin County workers for 70 percent of observations in the 2010 and 2011 data. While not ideal, this model-based approach is significantly better than randomly assigning observations from the place-of-work PUMAs that straddle the city border.

Imputing Hourly Wages

The ACS does not include data on hourly wages, only data on annual wage earnings. Thus, hourly wage values are imputed using respondents' reported annual income from wages, usual hours worked per week, and weeks worked per year. One further complication is that the ACS asks respondents to record the number of weeks they worked in the previous 12 months by selecting one of several intervals (e.g., 1–13 weeks, 14–26 weeks, 50–52 weeks, etc.). Thus, in order to impute an hourly wage, EPI must first construct a discrete value for respondents' weeks worked in the previous year. To do this, EPI used the Annual Social and Economic Supplement to the Current Population Survey (CPS-ASEC), which does include information on workers' discrete weeks worked in the previous calendar year. Using linear regression, EPI estimated how various

demographic, work, and economic variables vary with respondents' weeks worked per year, utilizing separate regression models for each interval. EPI then applied the regression coefficients from those models to the ACS data to predict workers' discrete weeks worked in the previous year.

EPI estimates respondents' hourly wage by dividing annual wage income by usual hours of work per week, multiplied by predicted weeks worked in the previous year. This imputation process is not ideal, as imputing hourly wages in this way compounds measurement error in the three variables used to derive hourly wages. Indeed, imputed hourly wages fall below the statutory minimum wage for roughly 10 percent of the ACS worker sample. However, the ACS is the only publicly available data set with the adequate sample size and place of work information needed to conduct this type of analysis.

The research team restricts the Minneapolis worker sample to individuals age 16 and older, who are currently employed, but not self-employed, and for whom imputed wage values are greater than $0.93 and less than $200. In all calculations of workers affected by increases in the minimum wage, EPI excludes all observations with imputed hourly wages less than 50 percent of the statutory minimum wage prior to the simulated increase. All wage and earnings data are adjusted for inflation so that the full 5-year sample is in 2014 dollars.

Identifying Workers Who Would Be Affected by an Increase in the Minimum Wage

Our minimum wage simulation model is an iterative model that simulates increases in the wage floor to specified amounts for a defined number of years. For this study, EPI simulated increases in the Minneapolis wage floor to $12 by 2021 (five annual increases of $0.60 beginning in 2017) and to $15 by 2021 (five annual increases of $1.20 beginning in 2017.)

Prior to the first simulated increase in the city minimum wage, modeled to take place in 2017, EPI adjust wages values to reflect both changes in the Minnesota state minimum wage since

the data period, which rose from $7.25 in July 2014 to $9.50 in August of 2016, and "natural" nominal wage growth. Observations with imputed hourly wages below the existing minimum wage are increased in proportion to the change in the minimum wage. For example, if an observation had an imputed hourly wage of $7.00 in 2014, when the state minimum wage was $7.25, their hourly wage is adjusted to equal ($7.00/$7.25) x $9.50 = $9.17. EPI do not automatically adjust these values up to the new minimum wage because the research team assumes whatever was keeping their imputed wage value below the previous minimum wage is likely to continue with the higher minimum wage. This would apply to Minnesota's lower minimum wage tier for employers who earn less than $500,000 a year in sales receipts.

For observations with imputed wages between the previous minimum wage and 115 percent of the new minimum wage, EPI increases their imputed wage by one-fourth of the difference between their existing wage and 115 percent of the new minimum wage. This choice of 115 percent of the new minimum wage reflects the cutoff point of any "spillover effects" resulting from the minimum wage increase. (Spillover effects are explained in the next section.) If this adjustment does not bring an observation's imputed wage up to the new minimum wage, they are assigned the new minimum wage. For example, if an observation has an hourly wage of $9.25 in 2014, their wage would be adjusted to equal $9.25 + (1/4 x ((1.15 x $9.50) - $9.25) = $9.67. However, if an observation has an hourly wage of $9.00 in 2014, their adjusted wage would equal $9.00 + (1/4 x ((1.15 x $9.50) - $9.00) = $9.48. Because this is below the new 2017 state minimum wage of $9.50, they are assigned a wage of $9.50. EPI uses this tiered adjustment approach to smooth out the bottom of the simulated 2017 wage distribution, resulting in a distribution that is somewhat more compressed than the 2014 distribution, but without a large artificial spike at the 2017 minimum wage of $9.50.

After these adjustments, EPI also adjusts all wage values to reflect "natural" nominal wage growth. For this adjustment, the research team assumes annual nominal wage growth of two percent, the rate of average annual nominal wage growth for the bottom quintile of Minnesota wage earners from 2013-2015, according to EPI's analysis of microdata from the Current Population Survey Outgoing Rotation Group.

EPI also adjusts the weights of the sample to reflect population growth between 2014 and 2017, using race and ethnicity-specific labor force growth projections provided by the Metropolitan Council. The workforce is grown each year of the model using an annualized growth rate of the labor force, by race/ethnicity. Using labor force projections by race/ethnicity of the Minneapolis-St. Paul-Bloomington metro area from the Metropolitan Council for the years 2010 and 2020, EPI calculates the annualized growth rate between those years and apply that rate to workers' the 'person weight' given to an individual by the ACS. Because 2014 is the base year of model, we simulate 2.5 years of population growth (starting in mid-year 2014 and ending in January 2017 when the wage increase takes effect). The projections only make certain racial/ethnic groups available, which include white (non-Hispanic), black (non-Hispanic), Hispanic, and other races. The annualized growth rates were negative for whites (indicating a projected decrease in their workforce) and positive for every other group.

The annual growth rates used in our model are:

Whites: -0.37 percent

Blacks: 2.24 percent

Hispanics: 3.23 percent

Other race/ethnic groups: 3.70 percent

In each simulated step of the minimum wage increases, EPI identifies two categories of workers that are affected by the policy change: "directly affected workers," who would otherwise earn less than the proposed minimum wage, and "indirectly affected workers," who would otherwise earn just above the new minimum wage and are likely to receive a raise through "spillover effects" as employers adjust their wage ladders to reflect the new wage floor. In other words, directly affected workers are those with hourly wages between 50 percent of the statutory minimum wage prior to the proposed increase, and the new proposed minimum wage in that step. (EPI includes workers with hourly wages as low as 50 percent of the current minimum wage to allow for measurement error in the hourly wage variable introduced by the imputation process.) Indirectly affected workers are those workers with wages greater than or equal to the proposed new minimum wage, but less than 115 percent of the dollar value of the new minimum wage—hereafter referred to as the "indirectly-affected cutoff". This cutoff point is chosen to reflect the findings of Dube, Giuliano, and Leonard (2015), which observed minimum-wage spillover effects for workers earning up to 15 percent above newly implemented minimum wages.

After each step, if an individual is predicted to be either directly or indirectly affected, her wage is adjusted to reflect her implied raise. For directly affected workers with hourly wages of at least 90 percent of the statutory minimum wage prior to the simulated increase, their raise is equal to the greater of: 1) the difference between the new minimum wage and their current wage; or 2) one-fourth of the difference between their current wage and the indirectly affected cutoff. The research team allows for these two possibilities because EPI believes it is likely that a worker close to, yet still below, the new minimum wage prior to the increase will receive a larger raise than simply an increase to the new minimum. For example, if a worker was earning $10.00 per hour prior to an increase in the minimum wage from $9.50 to $10.10, it stands to reason that her

employer will give her more than a $0.10 raise, particularly if lower-paid colleagues are receiving raises as large as $0.60. For workers earning between 50 percent and 89 percent of the minimum wage prior to the increase, they are given a raise proportional to the increase in the minimum wage. For example, a worker earning 75 percent of the minimum wage prior to the increase would receive a raise that brought her to 75 percent of the new minimum wage.

For all indirectly affected workers, their raise is modeled as one-fourth of the difference between their current wage and the indirectly affected cutoff. For example, an indirectly affected worker previously earning $10.20 in the above scenario would receive a raise of 0.25 x ($11.62-$10.20), or $0.36.

Having counted these directly and indirectly affected workers, the program iterates to the next proposed increase. Again, weights are adjusted to reflect the predicted population growth between the first and second increments in the proposed minimum-wage increase. Wage values are again adjusted to reflect natural nominal wage growth; however, all workers who received a raise as a result of the higher minimum wage (i.e., directly or indirectly affected workers) are given only 50 percent of the assumed natural nominal wage growth applied to all other observations. In years 2018 and onward in the simulation, the research team assumes a natural nominal wage growth rate equal to the Congressional Budget Office's projections for growth in the Consumer Price Index for Urban Consumers (CPI-U) as reported in CBO (2016). In each subsequent step, the same method for identifying directly and indirectly affected workers is applied, and the counts are recorded. The model iterates in this fashion for all remaining steps.

Metropolitan Council Population Growth Rates

A necessary component of this minimum wage simulation is to project the makeup of the Minneapolis workforce over the next five years, in order to factor how much of a change in

employment is related to changes in the population, and how much is related to changes in the minimum wage. In order to create this simulation, EPI generates an annualized population growth rate, while incorporating the Metropolitan Council's projections of population growth rates by age and by race/ethnicity. The Metropolitan Council generates their population growth rates by supplementing American Community Survey data with techniques from Regional Economic Models Inc.

> *The Metropolitan Council Long-range forecasts at Metropolitan Council are updated at least once per decade. Population, households and employment levels are projected with a 30-year time horizon. The regional and local forecasts express future expectations based on an understanding of regional dynamics, and modeling of real estate and land market dynamics, land policies and planning. Consistent with Minnesota Statutes 473.146 and 473.859, the Council's forecasts provide a shared foundation for coordinated, comprehensive planning by the Council and local governments.*
>
> *[…]*
>
> *Population changes are projected simultaneously, using detailed cohort-component demographic techniques to project fertility, births, aging and survival rates, and new economic geography techniques to project labor market results and migration. If industries' labor demand intensifies (or slackens), labor supply adjusts up (or down) through migration. Thus, economic competitiveness and labor demand are the major determinants of migration in the REMI PI model.*
>
> Metropolitan Council's Forecasts Methodology (March 2015)

Estimating the Impact on Operating Costs for Affected Industries

Raising the minimum wage affects business' operating costs differently in each industry because some industries will have a greater concentration of workers affected by the policy change and labor's share of total operating costs varies by industry. To estimate the impact of raising the minimum wage on business' operating costs, the research team looks at the change in total payroll attributable to the higher minimum wage within each industry, as predicted by our simulation. Assuming no change in the annual hours of workers in the sample, the research team calculates the total annual payroll of workers affected by the policy change after the final increase to $12 or $15, and compares it to the payroll of these same workers in a counterfactual scenario where the minimum wage did not change.

For this counterfactual scenario, the research team assumes that there is no change in the wage floor beyond the automatic linked adjustments in the state minimum wage, already scheduled under current law at the beginning of 2018. In addition, the research team assumes that nominal overall wages will grow at the same natural rate both in a world with and without the minimum wage hike. The implementation of a minimum wage will not affect the factors that determine the natural growth rate of wages. EPI takes the total increase in payroll attributable to the minimum wage change and divides by the total payroll in each industry in the counterfactual scenario to calculate the total percentage change in payroll. EPI uses data from Reich et.al. (2016, see their Table 6) to establish labor costs as a share of total operating costs for each of the major industries typically affected by changes in the minimum wage. EPI multiplies the percent change in total payroll costs by the share of total operating costs going to labor for each industry to arrive at a percent change in total operating costs by industry.

Family Budget Calculator

Methodology

The EPI Family Budget Calculator illustrates the income required to afford a modest, but adequate standard of living for 10 family types (including single persons) living in over 600 specific U.S. communities. The fact that the budgets differ by location is important, since certain costs, such as housing, vary significantly depending on where one resides. Geographical cost-of-living differences are built into the budget calculations by incorporating regional, state, or local variations in prices (depending on the item). This geographic dimension of EPI's family budget measurements offers a distinct comparative advantage over poverty thresholds, which only use a national baseline in their measurements (e.g., the federal poverty line), or which use a geographic component only for measuring differences in housing prices (e.g., the Supplemental Poverty Measure).

Family budget components

This section provides a brief description of each component of EPI's basic family budgets (which will soon be updated fully with data for 2014) and the restrictions and/or working assumptions entailed in calculating costs of housing, food, transportation, child care, health care, other necessities, and taxes.

Housing costs are based on the Department of Housing and Urban Development's (HUD) fair market rents, or FMRs (HUD 2014). FMRs represent rents (shelter rent plus utilities) at the 40th percentile (i.e., the dollar amount below which 40 percent of standard quality rental units are rented) for privately owned, structurally safe, and sanitary rental housing of a modest nature with suitable amenities. Rents for studio apartments were used for one-person families, one-bedroom apartments were used for two-adult families, two-bedroom apartments were used for families with

one or two children, and three-bedroom apartments were used for families with three or four children (based on HUD guidelines).

Food costs are based on the "low-cost plan" taken from the Department of Agriculture report Official USDA Food Plans: Cost of Food at Home at Four Levels (USDA 2014). This plan is the second-least-expensive of four types of food plans and assumes almost all food is bought at the grocery store and then prepared at home. The USDA food plans represent the amount families need to spend to achieve nutritionally adequate diets.

Transportation expenses are based on the costs of owning and operating a car for work and other necessary trips. The National Household Travel Survey (FHA 2009) is used to derive costs based on average miles driven per month by size of the metropolitan statistical area or rural area and multiplied by the cost per mile, as provided by the Internal Revenue Service (IRS 2014).

Child care expenses are based on costs of center-based child care and family-based care for four-year-olds and school-age children, as reported by the Child Care Aware of America annual report on the cost of child care by state (CCAA 2014). EPI assumes all families in urban areas utilize center-based care and all families in rural areas utilize family-based care.

Health care expenses have two components: Affordable Care Act (ACA) insurance premiums and out-of-pocket expenditures. Premiums are based on the lowest-cost bronze plan in the rating area adjusted for family size, age of user, and tobacco surcharge (Henry J. Kaiser Family Foundation 2014). For the purpose of this family budget, all members of the family are assumed to be non-smokers, and all adults are assumed to be 40 years old. Out-of-pocket medical expenditures are calculated for adults and children separately by region and are differentiated between metropolitan statistical areas and non–metropolitan statistical areas for those covered by private insurance (HHS 2013).

EPI's basic family budgets include the costs of other necessities such as apparel, entertainment, personal care expenses, household supplies (including furnishings and equipment, household operations, housekeeping supplies, and telephone services), reading materials, school supplies, and other miscellaneous items of necessity as reported for the second quintile from the Bureau of Labor Statistics Consumer Expenditure Survey (BLS 2013).

The family budget components enumerated thus far sum to the family's post-tax income. To calculate the tax component of family budgets, the research team utilizes the National Bureau of Economic Research's Internet TAXSIM (NBER 2013) to gather information on federal personal income taxes, state income taxes, and federal Social Security and Medicare payroll taxes.

EPI's basic family budgets sum each of these components to get the total cost of living in each area across the United States. Notably, these budgets do not include several components of what might be considered a middle-class lifestyle. In particular, they do not include any savings: There are no savings for a rainy day (e.g., job loss or unexpected medical bills), savings for retirement (except through Social Security payments), or further investments in their children (e.g., enrichment activities or college savings).

Table 2

Annual family budget and components for Minneapolis-St. Paul-Bloomington, MN-WI MSA, by family type

Cost Category	1 Adult 0 Child	1 Adult 1 Child	1 Adult 2 Child	1 Adult 3 Child	1 Adult 4 Child	2 Adult 0 Child	2 Adult 1 Child	2 Adult 2 Child	2 Adult 3 Child	2 Adult 4 Child
Rent	$7,296	$11,352	$11,352	$15,984	$15,984	$9,072	$11,352	$11,352	$15,984	$15,984
Food	$3,249	$4,792	$7,010	$9,346	$11,435	$5,957	$7,418	$9,384	$11,451	$14,007
Child care	$0	$11,040	$15,561	$16,315	$16,315	$0	$11,040	$15,561	$16,315	$16,315
Transportation	$5,400	$5,449	$5,449	$5,449	$5,449	$6,928	$6,991	$6,991	$6,991	$6,991
Healthcare	$2,218	$3,848	$5,479	$7,109	$7,591	$4,435	$6,066	$7,696	$9,327	$9,808
Other necessities	$5,093	$7,798	$8,869	$12,234	$13,243	$7,259	$9,066	$10,015	$13,251	$14,486
Taxes	$3,968	$9,231	$10,298	$14,738	$13,521	$5,014	$8,195	$8,636	$10,611	$10,027
Total	**$27,224**	**$53,509**	**$64,018**	**$81,176**	**$83,537**	**$38,666**	**$60,127**	**$69,636**	**$83,930**	**$87,618**

Source: Economic Policy Institute, Family Budget Calculator (http://www.epi.org/resources/budget/)

Family budget thresholds for Minneapolis

The research team uses family budget data for the Minneapolis-St. Paul-Bloomington, MN-WI MSA—the smallest available family budget area inclusive of Minneapolis. Table 2 presents the family budget thresholds and component parts for the ten primary family types (adult-child combinations) included in the family budget calculator.

In addition to these ten, EPI generated 13 additional variations for relatively uncommon family types using an equivalence scale method, similar to how the U.S. Census Bureau adjusts poverty thresholds. Equivalence scales are measures of the relative costs of living for families of different sizes and compositions that are otherwise similar. For example, if a family of two adults can live as well as a family of two adults and two children while spending only two-thirds as much, then relative to the reference family of two adults and two children, the equivalence scale value for a two-adult family is two-thirds. For the purpose of poverty measurement, the use of an equivalence scale is to scale up or down the threshold for the reference family to provide corresponding thresholds for other family types.

Census recommends that poverty thresholds for different family types be created by applying an explicit scale to the reference family poverty threshold. The scale should distinguish

the needs of children under 18 and adults but not make other distinctions by age; the scale should also recognize economies of scale for larger families. A scale of this type is the following:

Scale value = $(A + P*K)*F$

where A is the number of adults in the family, K is the number of children, each of whom is treated as a proportion P of an adult, and F is the scale economy factor. The formula calculates the number of adult equivalents ($A + PK$) and raises the result to a power F that reflects economies of scale for larger families. They recommend values for both P and F near 0.70; to be specific, they recommend setting P at 0.70 (i.e., each child is treated as 70% of an adult) and F in the range of 0.65 to 0.75. To calculate the actual thresholds, the ratio of the scale value from the formula for each family type to the value for the reference family type is applied to the reference family threshold.

EPI tested a variety of different combinations of reference families and values for the scale factor (F). Setting a reference family of 2 adults and 4 children (also the largest family size for which we have a family budget with discreet components) and a scale factor of 0.75 generated a family budget threshold for the other common family types that was closest to our original discrete thresholds. Thus, EPI used the 2A4C family type as the reference family for the scaled thresholds and a scale factor (F) of 0.75. Table 3 presents the family budget thresholds for the 13 family types generated through the equivalence scale. With the ten common family types built into the family budget calculator and these 13 relatively uncommon family types, 99 percent of all families and individuals in Minneapolis are covered.

Table 3 – Family Budget Expenses for Uncommon Family Types

	Family budgets for uncommon family types, derived through Census-style scaling												
	1 Adult 5 Child*	2 Adult 5 Child*	3 Adult *	3 Adult 1 Child*	3 Adult 2 Child*	3 Adult 3 Child*	4 Adult *	4 Adult 1 Child*	4 Adult 2 Child*	5 Adult *	5 Adult 1 Child*	5 Adult 2 Child*	6 Adult 0 Child*
Total	$83,478	$97,036	$61,589	$72,080	$82,083	$91,694	$76,420	$86,245	$95,710	$90,342	$99,671	$108,717	$103,580

Source: Economic Policy Institute, Family Budget Calculator (http://www.epi.org/resources/budget/)

Assessing income adequacy of families and workers in Minneapolis

To calculate the number and share of families and workers in Minneapolis falling below the family budget threshold, EPI simply compares families' total income to their respective family budget threshold. EPI analyzes only non-elderly families, defined as families with at least one adult below age 65. Subfamilies, i.e., families who live in the household of someone else, are treated as separate families, even in cases where the subfamily may be related to the householder. For example, adult children living with their parents or adult siblings living together are treated as separate family units when comparing their income levels with the corresponding family budget thresholds. The assumption is that a secure, yet modest, standard of living should not require subfamilies to share housing.

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DEMOGRAPHICS OF MINIMUM WAGE EARNERS

In order to identify the population that is likely to be affected by a change in the minimum wage, the RWC conducted a demographic analysis of the Minneapolis workforce. As a baseline, the research team uses the Metropolitan Council's projection of the demographic change of the workforce over the next ten years. This baseline is supplemented with American Community Survey data. The research team partnered with the Economic Policy Institute to estimate size of the population that is likely to be affected by the minimum wage. For the sake of this simulation, all workers earning 115% of the minimum wage or below are defined as "affected" by the minimum wage.

This demographic projection is simulated for each year over a five-year period. This next section reflects the estimates of the workforce in Minneapolis that are likely to be affected by the minimum wage in the year 2021.

Reading the Results

"Size of workforce" is a headcount of the number of persons in 2021, who work in Minneapolis and meet a given category. "Affected workers" is a headcount of the number of persons working in Minneapolis that meet the category detailed in the table who are earning

Example

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis
By Age

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Age		$12	$15	$12	$15	$12	$15	$12	$15
Under 20	6,000	3,000	3,000	56%	60%	7%	5%	19%	47%
20 to 25	26,000	10,000	16,000	38%	62%	21%	23%	20%	33%
25 to 39	123,000	17,000	28,000	14%	23%	36%	39%	14%	20%
40 to 54	100,000	10,000	15,000	10%	15%	20%	22%	13%	20%
55+	56,000	6,000	9,000	10%	16%	12%	12%	11%	18%
Total	**311,000**	**46,000**	**71,000**	**15%**	**23%**	**97%**	**101%** #	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

Difference from Rounding Error

within 15% of the proposed minimum wage or less. “Share of X that are Affected by MW” represents the share of a group of people who, according to the simulation, would be earning less than, or near the simulated minimum wage in 2021. For example, given a $12 minimum wage, 15% above a $12 minimum wage would be $13.80. “Share of Under 20 that are Affected by MW” represents the share of persons who work in Minneapolis, are under the age of 20, and earn less than $13.80 in 2021 (56%). In other words, 56% of teenage Minneapolis workers in 2021 would be affected by the simulated minimum wage. The remaining 44% of teenage workers in Minneapolis would be earning above $13.80 in 2021. This example is colored in red. “Share of MW Workforce that are X” represents how may persons in 2021 who work in Minneapolis and earn the minimum wage fit the given category. For example, “Share of MW Workforce that are 40 to 54” would represent the share of minimum wage earners who are between 40 and 54 (20%). In other words, 20% of all workers affected by the simulated minimum wage are between age 40 and 54. The remaining 80% of Minneapolis workers that are earnings less than $13.80 in 2021 are either older or younger than that age range. This example is colored in blue.

“Average Increase in Annual Wage” represents the change in annual wage earnings for a given group. This term measures the change in yearly earnings after the simulated change in the minimum wage. For this report, the average change in earnings represents yearly employee earnings, given the simulated minimum wage, less their yearly earnings in the same year had the simulated minimum wage not taken place. This simulation accounts for changes in demographics over the next five years, inflation over the next five years and accounts for the possibility that workers are paid less than the headline minimum wage. This latter consideration is important for Minneapolis because many employers are eligible to pay less than the current $9.50 wage. Because of their classification as a “small” employer, the EPI simulation of average increase in earnings

allows for employees to earn $7.75 scales the new wage rate by the same percentage of the highest minimum wage tier as their old wage rate. For a more detailed description of how this new wage rate is calculated, see the section of the report entitled "Imputing Hourly Wages" in the Economic Policy Institute Simulation section. Because the change in income is calculated according to a simulated change in wage only, Average Increase in Annual Wage should be viewed as a best case scenario, where earnings do not decrease after a change in hours worked, or a change in industry, and not as an econometric projection.

Age

Table 4

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Age

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Age		$12	$15	$12	$15	$12	$15	$12	$15
Under 20	6,000	3,000	3,000	56%	60%	7%	5%	19%	47%
20 to 25	26,000	10,000	16,000	38%	62%	21%	23%	20%	33%
25 to 39	123,000	17,000	28,000	14%	23%	36%	39%	14%	20%
40 to 54	100,000	10,000	15,000	10%	15%	20%	22%	13%	20%
55+	56,000	6,000	9,000	10%	16%	12%	12%	11%	18%
Total	**311,000**	**46,000**	**71,000**	**15%**	**23%**	**97%**	**101%**	**14%**	**22%**
							#		

Source: Economic Policy Institute, Metropolitan Council, and the American Community Survey
Difference from Rounding Error

- By sheer numbers, workers age from 25 thru 39 are the largest share of minimum wage earners
- The difference between populations that are affected by a minimum wage of $12 and $15 is greatest for workers in their early twenties. This finding implies that many of these workers earn somewhere in between these two rates
- Two thirds of people affected by a $12 minimum wage in 2021 are above the age of 25

Hourly Status

Table 5

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Hours Worked Per Week

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Hours		$12	$15	$12	$15	$12	$15	$12	$15
Part time (< 19h	14,000	5,000	6,000	35%	43%	11%	9%	16%	32%
Mid time (20-34	47,000	16,000	21,000	35%	45%	35%	29%	16%	31%
Full time (35+)	250,000	25,000	44,000	10%	18%	55%	62%	13%	19%
Total	**311,000**	**46,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Over half the workers affected by the increase in the minimum wage are working full time, suggesting that working more hours to increase earnings is less likely to be an available option
    - Full time is defined as 35 hours a week or more
    - Mid time is defined as working between 20 and 34 hours a week
    - Part time is considered working less than 20 hours a week

Highest Level of Education Status

Table 6

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Highest Education

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Education		$12	$15	$12	$15	$12	$15	$12	$15
Less than HS	16,000	8,000	10,000	51%	63%	17%	14%	14%	29%
High School	34,000	11,000	15,000	31%	44%	23%	21%	15%	24%
Some College	57,000	14,000	20,000	24%	35%	30%	28%	14%	22%
Assoc. Degree	26,000	3,000	6,000	13%	21%	7%	8%	14%	20%
Bachelors +	177,000	11,000	21,000	6%	12%	23%	29%	13%	17%
Total	**310,000**	**47,000**	**72,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Largest group of minimum wage earners by population and by relative share of minimum wage earners are workers with some college education
- All groups see relatively similar gains in annual wage with $12 minimum wage
- Over half of workers with less than a high school education are minimum wage earners

School Status

Table 7

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By School Status

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
School Status		$12	$15	$12	$15	$12	$15	$12	$15
In high school	3,000	2,000	2,000	57%	60%	3%	2%	17%	46%
In college	23,000	8,000	10,000	35%	45%	17%	15%	15%	28%
In graduate school	14,000	2,000	3,000	13%	20%	4%	4%	16%	26%
Not in school	271,000	35,000	56,000	13%	21%	76%	79%	14%	21%
Total	**311,000**	**47,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Three out of four Minneapolis workers who are currently working below the simulated minimum wage are not students
  - 57,000 workers have "Some College" as their highest level of education, but only 23,000 are currently in an undergraduate college program
    - 14,000 affected workers have "Some College" as highest education level, but only 8,000 are currently in an undergraduate program
- However, many workers are likely to earn the minimum wage while in school
- Schooling status does not identify whether the worker is in a certification training program

Race & Ethnicity

Table 8

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Race/Ethnicity

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Race/ Ethnicity		$12	$15	$12	$15	$12	$15	$12	$15
White	213,000	22,000	36,000	10%	17%	47%	51%	13%	19%
Black	37,000	10,000	15,000	27%	41%	22%	21%	14%	23%
Hispanic	21,000	8,000	11,000	39%	54%	18%	16%	15%	27%
Asian	28,000	4,000	5,000	13%	19%	8%	7%	15%	23%
Other	12,000	3,000	4,000	22%	32%	6%	5%	10%	20%
Total	**311,000**	**47,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- White reflects non-Hispanic White, Black reflect non-Hispanic Black, Asian reflect non-Hispanic Asian
- Even though two thirds of the total workforce are white, only half of the workforce affected by a $15 minimum wage are white
- Hispanic and Black workers are more likely to be affected by a change in the minimum wage, even though they are a smaller share of the minimum wage workforce
- The ethnic group with the largest relative share of workers who would be earning less than $15 an hour absent the minimum wage increase in 2021 are Hispanic

Citizenship Status

Table 9

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Citizenship Status

	Size of Workforce	Affected Workers		Share of X That Are Impacted By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Citizenship Status		$12	$15	$12	$15	$12	$15	$12	$15
Born citizen	258,000	33,000	53,000	13%	21%	71%	75%	30%	31%
Naturalized	26,000	5,000	7,000	21%	29%	12%	11%	66%	70%
Not US citizen	27,000	8,000	11,000	29%	39%	17%	15%	37%	37%
Total	**311,000**	**46,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Non-US workers and naturalized citizens are more likely to be affected by the change in the minimum wage than natural born citizens
- If net migration into the Twin Cities continues, economic migrants will represent a larger share of the total workforce at all wage level, including levels near the minimum wage

Commuter Status

Table 10

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Residential Status

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Residential		$12	$15	$12	$15	$12	$15	$12	$15
Commuter	216,000	23,000	38,000	11%	18%	50%	54%	14%	20%
Resident	95,000	23,000	33,000	24%	35%	50%	46%	14%	24%
Total	**311,000**	**46,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

Minneapolis is easily accessible to neighboring cities, many workers from neighboring cities are drawn to the Minneapolis job market.

- Even though a 2:1 majority of Minneapolis workers live in surrounding cities, the residents of Minneapolis are twice as likely to be affected by the simulated minimum wage increase

Supplemental Nutritional Assistance Program Usage

Table 11

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By SNAP Usage

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
SNAP		$12	$15	$12	$15	$12	$15	$12	$15
SNAP Recipient in Household	20,000	9,000	11,000	43%	56%	18%	16%	14%	28%
No SNAP Recipient in Household	291,000	38,000	60,000	13%	21%	82%	84%	14%	21%
Total	**311,000**	**47,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Most persons who earn the minimum wage are not in a household that receives SNAP
- The majority of SNAP recipients in 2021, however, are likely to be affected by a $15 minimum wage
- For an analysis of the change in SNAP usage in response to the simulated minimum wage, see the section of this report titled "What is the impact on Social Safety Net Participation?"

Household Poverty Status

Table 12

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Household Poverty Status

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Poverty Status		$12	$15	$12	$15	$12	$15	$12	$15
In poverty	19,000	12,000	14,000	65%	73%	26%	19%	22%	50%
101-200% poverty	32,000	15,000	21,000	48%	65%	33%	29%	12%	25%
201-400% poverty	82,000	12,000	24,000	14%	30%	25%	34%	12%	14%
400%+ poverty	176,000	6,000	11,000	4%	7%	13%	16%	13%	17%
Missing poverty status	3,000	1,000	1,000	40%	42%	2%	2%	22%	47%
Total	**312,000**	**46,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Two thirds of workers at or near poverty are likely to be affected by the minimum wage
- The largest represented group of minimum wage earners are not necessarily those under the poverty level, but those near it
- The largest increase in earnings from a minimum wage are observed by those in poverty

Household Income Status

Table 13

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Household Income

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Household Income		$12	$15	$12	$15	$12	$15	$12	$15
< $25,000	22,000	13,000	16,000	60%	71%	29%	22%	18%	39%
$25,000 - $49,000	46,000	13,000	21,000	27%	45%	27%	29%	11%	18%
$50,000 - $74,999	54,000	8,000	14,000	15%	25%	18%	19%	14%	20%
$75,000 - $99,999	52,000	5,000	9,000	10%	17%	11%	12%	12%	17%
$100,000 - $149,999	69,000	3,000	7,000	5%	10%	7%	9%	14%	15%
$150,000 <	68,000	4,000	6,000	6%	8%	9%	8%	16%	28%
Total	**311,000**	**46,000**	**73,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Half of workers that are likely to be affected by the simulated minimum wage live in households that earn less than $50,000
- As household income increases, the likelihood that one is affected by the minimum wage decreases
- The increase in earnings is largest for households with the least income, then relatively flat for other categories

Marital and Parental Status

Table 14

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Marital and Parental Status

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Marital and Parental Status		$12	$15	$12	$15	$12	$15	$12	$15
Married parent	94,000	7,000	11,000	7%	11%	14%	15%	14%	22%
Single parent	27,000	5,000	8,000	18%	28%	10%	11%	16%	22%
Married, no children	60,000	5,000	9,000	9%	15%	12%	13%	11%	18%
Single, no children	130,000	30,000	44,000	23%	34%	64%	62%	14%	22%
Total	**311,000**	**47,000**	**72,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- The largest share of minimum wage earners is single and without children; however, the largest share of the total workforce is also single without children
- The largest increase in earnings from the simulated minimum wage go to single parents
- Single workers are more likely to be affected by the simulated minimum wage than workers with children
- For more detailed descriptions of parental status and marital status, see the section of this report entitled "Family Status and Sole Providers"

Age and Gender

Table 15

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Age and Gender

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Age & Gender		$12	$15	$12	$15	$12	$15	$12	$15
Women, under 25	17,000	8,000	10,000	46%	60%	17%	14%	18%	31%
Women, 25 to 39	62,000	8,000	15,000	14%	23%	18%	20%	12%	18%
Women, 40 to 54	50,000	5,000	8,000	10%	15%	11%	11%	15%	24%
Women, 55+	31,000	4,000	6,000	12%	19%	8%	8%	11%	17%
Men, under 25	15,000	7,000	9,000	44%	58%	14%	12%	15%	28%
Men, 25 to 39	60,000	8,000	14,000	14%	23%	18%	19%	16%	23%
Men, 40 to 54	50,000	5,000	8,000	9%	16%	10%	11%	12%	17%
Men, 55+	26,000	2,000	3,000	8%	12%	5%	4%	10%	20%
Total	**311,000**	**47,000**	**73,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Women represent a slightly larger share of the total workforce than men, and also a slightly larger share of the affected simulated population
- Younger workers are more likely to be affected by a minimum wage, but the workforce that earns the minimum wage is
- Differences in the share of population affected are greater between age groups of the same gender than the same age group with different genders

Workers Under Age 25

Much of the discussion in economic literature on the impact of a change in the minimum wage revolves around the significance of young workers earning the minimum wage. As a sensitivity measure, the team estimates the relative shares of the workforces that is likely to be affected by the minimum wage and who are also under the age of 25. As a note, Share of Total MW Workforce that are Below 25 and X represents the share of workers who are young and earning the minimum wage in comparison to the entire population of workers who earn the minimum wage. This implies that the total share of workers represented in each table only represents three tenths of the minimum wage earning workforce because only three tenths of the minimum wage earning work force are below the age of 25.

Household Income for Workforce Under 25

Table 16

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

For Workforce Below Age 25 By Household Income

	Size of Workforce Below Age 25	Affected Workers Below Age 25		Share of X That Are Below Age 25 and Affected By MW		Share of Total MW Workforce That Are Below Age 25 and X		Average Increase in Annual Wage for Workers Below Age 25	
Household Income		$12	$15	$12	$15	$12	$15	$12	$15
Less than $25,000	7,000	4,000	4,000	57%	65%	8%	6%	19%	40%
$25,000 - $49,999	7,000	4,000	5,000	55%	66%	9%	7%	15%	30%
$50,000 - $74,999	6,000	2,000	3,000	38%	55%	5%	5%	18%	27%
$75,000 - $99,999	5,000	2,000	3,000	41%	61%	4%	4%	15%	20%
$100,000 - $149,999	3,000	1,000	1,000	29%	44%	2%	2%	13%	21%
$150,000 or more	5,000	2,000	3,000	38%	52%	4%	4%	19%	31%
Total	**33,000**	**15,000**	**19,000**	**45%**	**58%**	**31%**	**27%**	**17%**	**29%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Relative share of persons affected by the simulated minimum wage is relatively large for all household income levels
- Relative share of persons affected by $15 minimum wage is especially large
- Majority of minimum wage earners below age 25 hail from households with less than $50,000 income

Poverty Status for Workforce Under 25

Table 17

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

For Workforce Below Age 25 By Poverty Status

	Size of Workforce Below Age 25	Affected Workers Below Age 25		Share of X That Are Below Age 25 and Affected By MW		Share of Total MW Workforce That Are Below Age 25 and X		Average Increase in Annual Wage for Workers Below Age 25	
Poverty Status		$12	$15	$12	$15	$12	$15	$12	$15
In poverty	7,000	5,000	5,000	63%	67%	10%	7%	24%	56%
101-200% poverty	7,000	4,000	5,000	60%	73%	9%	7%	14%	30%
201-400% poverty	9,000	3,000	5,000	31%	56%	6%	7%	13%	17%
400%+ poverty	7,000	2,000	3,000	32%	46%	5%	4%	17%	25%
Missing poverty status	3,000	1,000	1,000	40%	42%	2%	2%	22%	47%
Total	**33,000**	**15,000**	**19,000**	**45%**	**58%**	**31%**	**27%**	**17%**	**29%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Relative share of workers affected by simulated $15 minimum wage is very large
- Half of the 'under 25' workforce would be affected by a change in the minimum wage

Education Status for Workforce Under 25

Table 18

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

For Workforce Below Age 25 By Highest Level of Schooling

	Size of Workforce Below Age 25	Affected Workers Below Age 25		Share of X That Are Below Age 25 and Affected By MW		Share of Total MW Workforce That Are Below Age 25 and X		Average Increase in Annual Wage for Workers Below Age 25	
Schooling		$12	$15	$12	$15	$12	$15	$12	$15
Less than high school	4,000	3,000	3,000	67%	73%	6%	4%	16%	38%
High school	5,000	3,000	4,000	56%	72%	6%	5%	16%	27%
Some college	14,000	7,000	9,000	49%	63%	15%	13%	18%	30%
Bachelor's degree or higher	9,000	2,000	3,000	23%	39%	4%	5%	16%	24%
Total	**32,000**	**15,000**	**19,000**	**47%**	**59%**	**31%**	**27%**	**17%**	**29%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Less education correlates with likelihood to be affected by minimum wage
- Average increase in income is slightly greater for those with some college

Full Time Status for Workforce Under 25

Table 19

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

For Workforce Below Age 25 By Full Time Status

	Size of Workforce Below Age 25	Affected Workers Below Age 25		Share of X That Are Below Age 25 and Affected By MW		Share of Total MW Workforce That Are Below Age 25 and X		Average Increase in Annual Wage for Workers Below Age 25	
Hourly Status		$12	$15	$12	$15	$12	$15	$12	$15
Part time (< 19h)	6,000	3,000	3,000	42%	49%	6%	4%	16%	36%
Mid time (20-34)	12,000	7,000	8,000	58%	68%	15%	12%	17%	37%
Full time (35+)	14,000	5,000	8,000	35%	56%	11%	11%	17%	25%
Total	**32,000**	**15,000**	**19,000**	**47%**	**59%**	**31%**	**27%**	**17%**	**29%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Most affected workers are working more than part time
- Higher share of "under 25" workers are mid time than the general population

Family Status and Sole Providers

Table 20

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Household Makeup

	Size of Workforce	Affected Workers		Share of X That Sole Providers for Family		Share of Family income Earned by Affected Worker		Average Increase in Annual Wage	
Household Makeup		$12	$15	$12	$15	$12	$15	$12	$15
Women, married parent	44,000	4,000	6,000	3%	3%	30%	31%	13%	24%
Women, single parent	21,000	4,000	6,000	32%	37%	66%	70%	16%	22%
Women, married, no children	31,000	3,000	5,000	11%	9%	37%	37%	11%	19%
Women, single, no children	65,000	14,000	21,000	48%	54%	61%	68%	15%	21%
Men, married parent	50,000	2,000	4,000	14%	15%	45%	52%	15%	21%
Men, single parent	6,000	1,000	2,000	47%	49%	69%	72%	17%	21%
Men, married, no children	30,000	2,000	4,000	17%	20%	47%	53%	13%	17%
Men, single, no children	65,000	16,000	23,000	49%	53%	65%	68%	14%	24%
Total	**312,000**	**46,000**	**71,000**	**37%**	**40%**	**57%**	**61%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Note, single workers with no children are still counted as sole providers for their family unit, even though they have no dependents
- The group with the largest share of family income affected by minimum wage are single parents
- The difference in average increase in annual wage is within 6% between each group

Table 21

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Gender, Marital, and Familial Status

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Gender, Marital, and Familial Status		$12	$15	$12	$15	$12	$15	$12	$15
Women, married parent	44,000	4,000	6,000	10%	14%	9%	9%	13%	24%
Women, single parent	21,000	4,000	6,000	18%	29%	8%	9%	16%	22%
Women, married, no children	31,000	3,000	5,000	11%	16%	7%	7%	11%	19%
Women, single, no children	65,000	14,000	21,000	21%	33%	29%	30%	15%	21%
Men, married parent	50,000	2,000	4,000	5%	9%	5%	6%	15%	21%
Men, single parent	6,000	1,000	2,000	15%	25%	2%	2%	17%	21%
Men, married, no children	30,000	2,000	4,000	8%	14%	5%	6%	13%	17%
Men, single, no children	65,000	16,000	23,000	25%	36%	35%	33%	14%	24%
Total	**312,000**	**46,000**	**71,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Married male parents are least likely to be affected by increase in minimum wage
- Single parents are more likely to earn less than projected minimum wage than married parents, assuming no policy change
- Largest share is of minimum wage earners who are single with no children

EFFECTS OF THE FAMILY BUDGET

In order to show the affect a change in the minimum wage might have on a working family, EPI produced a summary of families in the Minneapolis area that are able to meet their budgetary needs. EPI identifies a basket of goods that take up the largest shares of a typical family's expense, and projects how many people have difficulty meeting those needs. For a detailed description of how these bundles are chosen, see the section of this report entitled "Family Budget Components." Table 2 reflects the costs used to represent a family's needs. In context, a minimum wage of $12 an hour would translate to $24,960 a year if worked 40 hours a week for 52 weeks a year. A minimum wage of $15 and hour would translate to $31,200 a year if worked under the same condition.

Table 2. Repeated

Annual family budget and components for Minneapolis-St. Paul-Bloomington, MN-WI MSA, by family type

Cost Category	1 Adult 0 Child	1 Adult 1 Child	1 Adult 2 Child	1 Adult 3 Child	1 Adult 4 Child	2 Adult 0 Child	2 Adult 1 Child	2 Adult 2 Child	2 Adult 3 Child	2 Adult 4 Child
Rent	$7,296	$11,352	$11,352	$15,984	$15,984	$9,072	$11,352	$11,352	$15,984	$15,984
Food	$3,249	$4,792	$7,010	$9,346	$11,435	$5,957	$7,418	$9,384	$11,451	$14,007
Child care	$0	$11,040	$15,561	$16,315	$16,315	$0	$11,040	$15,561	$16,315	$16,315
Transportation	$5,400	$5,449	$5,449	$5,449	$5,449	$6,928	$6,991	$6,991	$6,991	$6,991
Healthcare	$2,218	$3,848	$5,479	$7,109	$7,591	$4,435	$6,066	$7,696	$9,327	$9,808
Other necessities	$5,093	$7,798	$8,869	$12,234	$13,243	$7,259	$9,066	$10,015	$13,251	$14,486
Taxes	$3,968	$9,231	$10,298	$14,738	$13,521	$5,014	$8,195	$8,636	$10,611	$10,027
Total	**$27,224**	**$53,509**	**$64,018**	**$81,176**	**$83,537**	**$38,666**	**$60,127**	**$69,636**	**$83,930**	**$87,618**

Source: Economic Policy Institute, Family Budget Calculator (http://www.epi.org/resources/budget/)

Family Budget Threshold Counts

Table 22

Count and share of non-elderly families, individuals in non-elderly families, and single persons in Minneapolis below the family budget threshold

	Estimated population	Below the family budget threshold	Share below the family budgets threshold
Families and single persons	188,091	87,722	46.6%
Individuals in families and single persons	338,278	163,074	48.2%

Notes: Figures reflect families and persons in non-elderly families that fit one of the 23 family types for which we have a family budget threshold or can generate one through equivalence scales. These 23 family budget thresholds cover 99 percent of all families and persons in the Minneapolis sample. We analyze only non-elderly families, defined as families with at least one adult below age 65. Subfamilies—i.e., families who live in the household of someone else—are treated as separate families, even in cases where the subfamily may be related to the householder. For example, adult children living with their parents or adult siblings living together are treated as separate family units when comparing their income levels with the corresponding family budget thresholds. This is done under the assumption that a secure yet modest standard of living should not require subfamilies to share housing.

Source: EPI analysis of American Community Survey microdata, 2010–2014

- Families and single persons represents functional unit
- Individuals in families and single persons represents persons in total under threshold
- Nearly half of the persons in the Minneapolis sample cannot easily meet their expenses

Table 23

Demographics of Minneapolis workers in non-elderly families below the family budget threshold who live in the city but may work elsewhere

Category	Estimated Total Workforce	Share of the Total Workforce	Below the Family Budget	Share of Category That Are Below the Family Budget Threshold	Share of Total Below Family Budget That Are Category
Total	204,737	100.0%	71,491	34.9%	100.0%
Sex					
Female	97,266	47.5%	34,988	36.0%	48.9%
Male	107,471	52.5%	36,503	34.0%	51.1%
Family status					
Married parent	39,767	19.4%	12,367	31.1%	17.3%
Married, no children	37,095	18.1%	4,961	13.4%	6.9%
Single parent	13,209	6.5%	9,494	71.9%	13.3%
Single, no children	114,666	56.0%	44,670	39.0%	62.5%
Race/ethnicity					
White	148,865	72.7%	39,375	26.4%	55.1%
Black or African American	21,245	10.4%	12,211	57.5%	17.1%
Hispanic	17,756	8.7%	11,823	66.6%	16.5%
Asian or other race	16,871	8.2%	8,082	47.9%	11.3%
Education					
Less than high school	13,735	6.7%	9,660	70.3%	13.5%
High school	27,206	13.3%	14,749	54.2%	20.6%
Some college	56,871	27.8%	26,941	47.4%	37.7%
Bachelor's	69,310	33.9%	15,963	23.0%	22.3%
Advanced degree	37,615	18.4%	4,177	11.1%	5.8%
Place of birth					
Outside U.S.	33,595	16.4%	19,270	57.4%	27.0%
U.S. State or territory	171,142	83.6%	52,221	30.5%	73.0%
Citizenship					
Born citizen	172,764	84.4%	52,798	30.6%	73.9%
Naturalized	12,531	6.1%	5,328	42.5%	7.5%
Not US citizen	19,442	9.5%	13,365	68.7%	18.7%

Notes: Figures reflect workers who live within Minneapolis--though they may work in another jurisdiction—in non-elderly families that fit one of the 23 family types for which we have a family budget threshold or can generate one through equivalence scales. These 23 family budget thresholds cover 99 percent of all families and persons in the Minneapolis sample. We analyze only non-elderly families, defined as families with at least one adult below age 65. Subfamilies—i.e., families who live in the household of someone else—are treated as separate families, even in cases where the subfamily may be related to the householder. For example, adult children living with their parents or adult siblings living together are treated as separate family units when comparing their income levels with the corresponding family budget thresholds. This is done under the assumption that a secure yet modest standard of living should not require subfamilies to share housing.
Source: EPI analysis of American Community Survey microdata, 2010-2014

Table 24

Demographics of Minneapolis resident workers in non-elderly families below the family budget threshold

Category	Estimated Total Workforce	Share of the Total Workforce	Below the Family Budget	Share of Category That Are Below the Family Budget Threshold	Share of Total Below Family Budget That Are Category
Total	89,392	100.0%	32,396	36.2%	100.0%
Sex					
Female	45,126	50.5%	16,157	35.8%	49.9%
Male	44,265	49.5%	16,240	36.7%	50.1%
Family status					
Married parent	16,615	18.6%	4,786	28.8%	14.8%
Married, no children	14,681	16.4%	1,875	12.8%	5.8%
Single parent	6,176	6.9%	4,532	73.4%	14.0%
Single, no children	51,919	58.1%	21,202	40.8%	65.4%
Race/ethnicity					
White	62,004	69.4%	17,451	28.1%	53.9%
Black or African American	11,748	13.1%	6,549	55.7%	20.2%
Hispanic	7,688	8.6%	5,036	65.5%	15.5%
Asian or other race	7,952	8.9%	3,360	42.3%	10.4%
Education					
Less than high school	6,063	6.8%	4,553	75.1%	14.1%
High school	11,071	12.4%	6,949	62.8%	21.5%
Some college	21,914	24.5%	11,086	50.6%	34.2%
Bachelor's	30,898	34.6%	7,548	24.4%	23.3%
Advanced degree	19,445	21.8%	2,259	11.6%	7.0%
Place of birth					
Outside U.S.	14,624	16.4%	7,432	50.8%	22.9%
U.S. State or territory	74,768	83.6%	24,964	33.4%	77.1%
Citizenship					
Born citizen	75,398	84.3%	25,047	33.2%	77.3%
Naturalized	5,186	5.8%	1,792	34.6%	5.5%
Not US citizen	8,807	9.9%	5,557	63.1%	17.2%

Notes: Figures reflect Minneapolis resident workers (they live and work in Minneapolis) in non-elderly families that fit one of the 23 family types for which we have a family budget threshold or can generate one through equivalence scales. These 23 family budget thresholds cover 99 percent of all families and persons in the Minneapolis sample. We analyze only non-elderly families, defined as families with at least one adult below age 65. Subfamilies—i.e., families who live in the household of someone else—are treated as separate families, even in cases where the subfamily may be related to the householder. For example, adult children living with their parents or adult siblings living together are treated as separate family units when comparing their income levels with the corresponding family budget thresholds. This is done under the assumption that a secure yet modest standard of living should not require subfamilies to share housing.
Source: EPI analysis of American Community Survey microdata, 2010-2014

INDUSTRY EFFECTS

Components

The purpose of this industry simulation is to reflect how changes in the minimum wage might change industry behavior. This simulation relies on three levels of analysis. In the first level, RWC estimates the change in labor costs as a function of employee earnings, hours, and participation in the workforce. These estimates are designed to describe changes in labor costs one industry at a time and are not intended to reflect changes in the economy as a whole. Second, RWC explores the changes in the composition of costs that employers incur after an increase in the minimum wage. Third, RWC explores how changes in the minimum wage reduce worker turnover.

Because these estimates are aggregated at the industry level, there is no way to tell which category of workers would be affected most by changes in employment or earnings after a minimum wage increase. The simulation also provides no detail about cross sectoral changes in industry. The simulation relies on national, state, and county level data. Minnesota has a two-tiered minimum wage, where large employers pay $9.50 per hour and small employers are eligible to pay $7.75 per hour. The RWC simulations retain the two-tiered wage model and utilize Minnesota data over the last 20 years.

Finally, it is important to remember that the Roy Wilkins Center simulation relies on firms that are currently eligible to pay the “small” employer minimum wage will see a proportional increase in their minimum wage as well, however Roy Wilkins Center does not attempt to model if these firms are more or less likely to pay beyond the small firm minimum wage after the increase. This implies many firms may see smaller changes in labor cost if they currently pay in between the large and small firm minimum wages.

Short-Run Cost

Table 25

Panel a Change in Labor Costs from a $12 Minimum Wage in Minneapolis

Industry	Percent Change in Payroll	Labor Share of Operating Costs	Percent Change in Operating Costs
All Industries	0.5%	22.1%	0.1%
Grocery stores	7.6%	12.2%	0.9%
Restaurants	6.4%	30.7%	2.0%
Administrative and support	2.7%	61.1%	1.6%
Retail trade	1.1%	10.8%	0.1%
Residential care, social assist	1.5%	52.2%	0.8%
Other services	0.8%	33.8%	0.3%
Nondurable manufacturing	0.7%	6.9%	0.0%
Wholesale trade	0.5%	6.2%	0.0%
Ambulatory care	0.2%	52.9%	0.1%
Hospitals	0.1%	44.1%	0.0%

Panel b Change in Labor Costs from a $15 Minimum Wage in Minneapolis

Industry	Percent Change in Payroll	Labor Share of Operating Costs	Percent Change in Operating Costs
All Industries	1.5%	22.1%	0.3%
Grocery stores	18.6%	12.2%	2.3%
Restaurants	17.5%	30.7%	5.4%
Administrative and support	8.1%	61.1%	5.0%
Residential care, social assist	4.6%	52.2%	2.4%
Retail trade	3.1%	10.8%	0.3%
Other services	2.5%	33.8%	0.8%
Nondurable manufacturing	2.2%	6.9%	0.2%
Wholesale trade	1.6%	6.2%	0.1%
Ambulatory care	0.8%	52.9%	0.4%
Hospitals	0.4%	44.1%	0.2%

Note: Estimates for labor costs from EPI , also Reich et al. (2016, their Table 6)

In order to estimate the change in industry labor costs, RWC measures the cumulative change in payroll expenditures over the period of a phased in wage increase. RWC compares the

changes in labor costs to estimate the industry payroll share of total costs. These estimates come from national averages that were computed by EPI. Combining these terms reflects the change in payroll as a share of the industry's total budget. See Table 25 for results. For more detail on how these industry national averages were calculated, see the section of this report titled "Estimating the Impact on Operating Costs for Affected Industries." The results of these simulations are similar to the estimations found in Reich and Laitinen (2003), which studied an increase of the minimum wage in San Francisco. This increase was comparable in size to the increase from $9.50 to $12 simulated in this report. Reich and Laitinen found that labor costs on average increased by approximately 1%. Likewise, in terms of overall operating costs, 66.9% of firms saw an increase in operating cost of less than 1%, with an additional 15.6% seeing an increase in operating cost between 1% and 5% (see Reich and Laitinen, 2003, their table 14). These results are consistent with the EPI simulation of changes in operational costs.

For labor-intensive industries, RWC projects an overall increase in payrolls costs, varying according to the specific industry. Changes in payroll are generally small (18.6% for grocery stores facing a $15 minimum wage) when compared to the size of the change in the minimum wage (33% for a $12 minimum wage, 66% for a $15 minimum wage). This difference may reflect worker earnings that exceed the current minimum wage and may be close to the proposed new threshold.

Although labor represents a large share of operating costs for many industries, only retail, residential care, food related, and administrative support industries see a change in operating costs greater than two percent. RWC's previous analysis of employee earnings and total labor force estimates focused on Minneapolis; an expansion to include Hennepin/Ramsey County yields larger increases in employee earnings and, therefore, larger changes in operating costs for the industry

average (see section of this report entitled "Appendix for Economic Analysis"). Further, these estimates assume that the industry does not adopt any changes in technology or training and that employee tenure and seniority is unchanged.

Long-Run Workforce

Table 26 Panel a

Change in Turnover in Industries After Change in the Minimum Wage

Industry	Geography	Hires	Separations	Job Gains	Job Loss	Turnover Rate	Employment
Retail							
	USA Border Counties	n/a	n/a	n/a	n/a	n/a	n/a
	Minnesota Border Counties	-0.062***	-0.072***	-0.033**	-0.019	-0.009***	0.024
		(0.014)	(0.014)	(0.015)	(0.014)	(0.001)	(0.016)
Healthcare							
	USA	n/a	n/a	n/a	n/a	n/a	n/a
	Minnesota Border Counties	0.015	0.030	0.028	-0.015	-0.003***	0.015
		(0.025)	(0.025)	(0.025)	(0.024)	(0.001)	(0.025)
Restaurants							
	USA	-0.264**	-0.225*	n/a	n/a	-0.212**	-0.022
		(0.134)	(0.126)	n/a	n/a	(0.090)	(0.091)
	Minnesota Border Counties	-0.056	-0.073*	-0.075*	-0.081**	-0.018***	0.017
		(0.040)	(0.039)	(0.040)	(0.037)	(0.002)	(0.047)
All Industries							
	USA	n/a	n/a	n/a	n/a	n/a	n/a
	Minnesota Border Counties	-0.043***	-0.050***	-0.021	-0.031**	-0.009***	0.049***
		(0.013)	(0.013)	(0.013)	(0.013)	(0.001)	(0.015)

Robust Standard Errors in Parenthesis

* p < 0.1, ** p < 0.05, *** p < 0.01

Data from Quarterly Workforce Indicators data from the Center of Economic Studeiea at the US Census Bureau, formulas from DLR (2014)

In order to simulate the workforce effects of a change in the minimum wage, the Roy Wilkins Center simulated the model from Dube, Lester, and Reich (DLR) 2014, which relies on Quarterly Workforce Indicator data. The dataset matches survey results from employees with employers, so there is both firm level data, as well as individual employee characteristics. In this model, DLR(2014) replicates similar models as DLR (2010), wherein changes in employment and earnings are estimated as a function of county-level economic indicators, population, the state-level minimum wage, and a geographic control for county pairs that cross state lines. Because this model relies on QWI data, and not the Quarterly Census of Employment and Wages, the authors are able to regress a similar equation on new outcomes. These outcomes include new employee positions added (lost) within a quarter called Job gains (loss), new employee positions added (lost) between two quarters called Hires (Separations), or if the same set of employees are working at the same firms from one quarter to the next called Turnover.

Table 26 Panel b

(using border county sample with WI control)

Simulated Changes in Quarterly Turnover in Minnesota

	Wage	Hires	Separations	Turnover
Retail	$12	-1.82%***	-2.11%***	-0.27%***
	$15	-3.29%***	-3.82%***	-0.48%***
Health	$12	0.45%	0.89%	-0.09%***
	$15	0.81%	1.63%	-0.16%***
Restaurant	$12	-1.65%	-2.14%*	-0.53%***
	$15	-2.98%	-3.87%*	-0.97%***
All	$12	-1.26%***	-1.47%***	-0.27%***
	$15	-2.29%***	-2.66%***	-0.48%***

Data from Quarterly Workforce Indicators data from the Center of Economic Studeiea at the US Census Bureau, formulas from DLR (2014). Minimum wage formula based on EPI simulated schedule.

Simulations based on elasticities compunded. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. If a simulation doesn't have a marker, it is based on a statistically insignificant elasticity, and we cannot reject the possability of a 0% effect.

The hires rate represents the number of new employees working at a firm where they were not working in the previous quarter. The separations rate represents the number of employees who worked at the firm the previous quarter, but no longer work there. the reason for their leave could be voluntary or involuntary. The turnover rate is calculated as the difference between the Hires

rate and the Separations rate, so that it represents the net churn of employees at a firm in a quarter, in a county.

For the sake of this simulation, the Roy Wilkins Center limits observations to counties throughout Minnesota and neighboring border counties after the year 2000. The team measures the effect of the minimum wage in the restaurant industry, healthcare, retail, and in all industries together. For comparison, the team includes the original nationwide estimations from the authors, which also includes county pairs that cross state borders.

The research team simulates this model three ways. First with counties through the entire state, second only with counties along the state border, and a third model with only counties on the state border with a special control for Wisconsin counties through time. This third model controls for a time where Wisconsin counties observed a larger minimum wage than Minnesota. This added control allows the research team to simulate the effect of a minimum wage increase, and not only the effect of the increase within the state of Minnesota.

Even though Hennepin County is not on the state border, the authors of this paper would argue that the estimated change in hires, separations, and turnover from border counties is an accurate estimate of the change in turnover rate everywhere after a change in the minimum wage because this statistical technique prioritizes the possibility that workers could seek jobs in a bordering county if they could not find a job in their current county. This implies that the estimate from the border counties across the state of Minnesota and the same model with a control for Wisconsin border counties should be interpreted as the best estimate for the change in turnover in Hennepin County, and therefore Minneapolis. The reason the authors would prefer this method because it removes the complications that arise from other unrelated policy changes or macroeconomic changes that would have occurred at the same time as the minimum wage increase.

Because the DLR (2014) model measures the change in hires, separations, and turnover resulting from a change in the minimum wage by pairing counties with neighboring counties who do not observe a change in the minimum wage, and because these pairings are designed to be geographically close to each other, this model suggests that there are reductions in quarterly employee turnover, even after accounting for economic conditions in the state the total number of competing firms in an industry in an area.

If one prefers the Minnesota based estimates, this model predicts that the simulated minimum wage will reduce quarterly turnover by about half of one percent. It also predicts that it will reduce both hires and separations by less than 4%. If one prefers national estimates, this model finds similar results, but to a larger degree. It is possible that this finding indicates that a reduction in separations leads to a reduction of new hires because positions are already filled, driving a reduction in turnover. It is also possible, however, that a reduction in hires leads to fewer people who work at a firm, resulting in the inability to separate with a worker who never worked for at a firm in the first place. By itself, one cannot say which factor drives turnover, the reduction in hires, or the reduction in separations. When taken together the reduction in quarterly turnover implies that at the end of the quarter, firms are less likely to have fewer workers than when they started the quarter, regardless of the cause.

In order to determine if the reduction in hires or the reduction in separations is driving the change in turnover, one would need to make additional estimates for overall employment after a change in the minimum wage. The authors of DLR (2014), would believe that the minimum wage does not reduce overall employment, as evidenced by their other collaborations (see ADRZ 2015). This would support the model that the reduction in turnover is driven by fewer people separating from their jobs rather than a model where fewer workers are hired in the first place.

Finally, DLR produces larger estimates for the reduction in turnover using than national sample than the Minnesota only sample would imply. These results are shown in Table 26 Panel A for the restaurant industry. The Roy Wilkins Center does not fully replicate these results because much of the data required to perform this estimation is not readily publically available.

Cost of Turnover

After a change in the minimum wage, the composition of employers' costs changes slightly over time. In the short run, there is an increase in payroll costs to accommodate a higher minimum wage (see simulated results in Table 25) but there is also a concurrent reduction in employee turnover. This reduction in turnover is found across industries. RWC finds that there may be a small decrease in new hires (see 'Hires' in Table 26) after a change in the minimum wage, but this decrease is statistically indistinguishable from zero in many of the models tested. There is a statistically significant decrease in separations (see 'Separations' in Table 26). This decrease in separations was greater in magnitude than the decrease in hires across industries, but both decreases are still relatively small. Hires are defined as the number of persons employed at an establishment who were not employed at that establishment one quarter before. Separations are defined as the number of persons who were employed by the establishment at one time, but were not employed by the same establishment the next quarter.

On balance, the change in hires and separations implies that, in total, there are fewer employee separations after an increase in the minimum wage than before, which explains a statistically significant decrease in employee turnover. On average, firms separate from their workers less often per quarter (it should be mentioned, the data cannot differentiate between voluntary or involuntary separation). For each industry, however, the decrease in employee turnover is small. There are similar studies that evaluate the reduction in turnover for the entire

nation, however these studies rely on a much larger sample size to establish their results. A reduction in turnover is important in determining operational costs because a reduction in turnover relates to a reduction in position vacancies. Employers may choose to bring in temporary help, ask existing employees to fill in the gap and pay overtime, spend time posting and searching for someone to fill the vacant position. In addition to these directly observable costs, there are indirect costs, which take away from a business's profits by making them less efficient. After an employee leaves a firm, they don't only take their labor hours with them, they indirectly take their knowledge of how things work at the firm, their understanding of the product they produce, and they take any techniques they have personally developed to improve the firm. This kind of human capital can only be valuable to the firm, however, the longer an employee stays with their employer. A reduction in turnover can then lead to a reduction in indirect costs by retaining efficient employees rather than spending time developing the same skills with a new employee. This also prevents the business from forgoing income that would be gained by a well-trained employee. Hinkin and Tracey (2000) find that filling a hotel food service vacancy in the year 2000 costs $2,077 in their paper "The Cost of Turnover." In the same paper, they found a hotel retail clerk cost $3,383. A reduction in turnover resulting from the minimum wage may therefore decrease the long-term costs of employers by incentivizing an employee to stay.

For more detailed analysis of turnover and changes in separations, see the section of this report entitled "RWC Regional Sensitivity Check."

Recouping Costs with Increasing Prices

Table 27 – Results for Change in Restaurant Menu Prices after San Jose Minimum Wage Change

Author (year)	Aggregation level	Dataset	Outcome	Effect	S.E.
Restaurant industry (Full Service)					
Allegretto & Reich (2015)	San Jose, CA	Online Menu Survey	Change in menu prices	0.04**	0.148
Restaurant industry (Partial Service)					
Allegretto & Reich (2015)	San Jose, CA	Online Menu Survey	Change in menu prices	0.083***	0.068
Restaurant industry (Franchises or Chains)					
Allegretto & Reich (2015)	San Jose, CA	Online Menu Survey	Change in menu prices	0.098***	0.030
Restaurant industry (Non Chains)					
Allegretto & Reich (2015)	San Jose, CA	Online Menu Survey	Change in menu prices	0.030*	0.016
Restaurant industry (Fewer than Seven Employees)					
Allegretto & Reich (2015)	San Jose, CA	Online Menu Survey	Change in menu prices	0.077***	0.024
Restaurant industry (8 - 39 Employees)					
Allegretto & Reich (2015)	San Jose, CA	Online Menu Survey	Change in menu prices	0.039*	0.020
Restaurant industry (40 or more employees)					
Allegretto & Reich (2015)	San Jose, CA	Online Menu Survey	Change in menu prices	0.008	0.025

Allegretto, Dube, Lester, and Reich find that the restaurant industry is likely to see large increases in employee earnings after a minimum wage increase, but not see a large change in unemployment. To explain how these changes are possible at the same time, Allegretto and Reich provide further analysis on the increase of restaurant prices after a change in the minimum wage. Allegretto and Reich monitor the menu prices listed on restaurant websites around the time of a change in the minimum wage in San Jose California. California's minimum wage does not have an exemption for tipped workers, and is, therefore, comparable to Minnesota's minimum wage. They find that limited service restaurant prices increased by 0.83% and sit down restaurants prices increased by

0.4% for every 10% increase in the minimum wage. This finding implies that some of the employee earnings gains are financed by passing through some of the

labor cost to customers in order to avoid constraining a restaurant's budget.

- For all kinds of restaurants, the relative change in prices in response to a change in the minimum wage is small
- Partial service restaurants are slightly more likely to increase prices in response to changes in the minimum wage than full service
- Franchises are slightly more sensitive to changes in the minimum wage than non-chains
- Smaller restaurants are sensitive to changes in the minimum wage than restaurants with many employees
- Same study also finds half of cost of payroll increase from minimum wage is passed through to consumers, which could explain some of this increase

Table 27 a

Changes in Menu Prices for Establishing a $12 Minimum Wage in Minneapolis

			Expected Change in Limited Service Menu Prices				Expected Change in Full Service Menu Prices			
Year	Wage	Annual Change	Annual Change	Confidence Interval			Annual Change	Confidence Interval		
2016	$9.00									
2017	$9.60	6.7%	0.6%	0.5%	to	0.6%	0.27%	0.2%	to	0.3%
2018	$10.20	6.3%	0.5%	0.5%	to	0.5%	0.25%	0.2%	to	0.3%
2019	$10.80	5.9%	0.5%	0.5%	to	0.5%	0.24%	0.2%	to	0.3%
2020	$11.40	5.6%	0.5%	0.5%	to	0.5%	0.22%	0.2%	to	0.2%
2021	$12.00	5.3%	0.4%	0.4%	to	0.4%	0.21%	0.2%	to	0.2%
Cumulative		33%	2.5%	2.4%	to	2.5%	1.2%	1.1%	to	1.3%

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from Allegretto and Reich (2015). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in Table 27

Changes in Menu Prices for Indexing proposed $12 minimum wage in Minneapolis

			Expected Change in Limited Service Menu Prices				Expected Change in Full Service Menu Prices			
Year	Wage	5 Year Wage Change	5 Year Change After Indexing	Confidence Interval			5 Year Change After Indexing	Confidence Interval		
2021	$12.00									
2026	$13.25	10.4%	1.0%	1.0%	to	1.0%	0.40%	0.4%	to	0.4%
2031	$14.63	10.4%	1.0%	1.0%	to	1.0%	0.40%	0.4%	to	0.4%
Cumulative		22%	2.0%	2.0%	to	2.1%	0.8%	0.7%	to	0.9%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to test shocks in the minimum wage in a controlled setting. Because inflation indexing is observable, workers may adjust to changes in their wages differently. Model also assumes no changes in the federal or state minimum wage. Cumulative changes are compounded annually

Expected Price Changes in a $25 Meal from an Indexed $12 Minimum Wage

Sample Menu Schedule		Expected Limited Service Menu Prices				Expected Full Service Menu Prices			
Year	Meal Price	New Price	Confidence Interval			New Price	Confidence Interval		
2021	$25.00	$25.62	25.61	to	25.63	$25.30	25.28	to	25.32
2026	$25.00	$25.88	25.86	to	25.90	$25.40	25.37	to	25.43
2031	$25.00	$26.14	26.11	to	26.16	$25.50	25.47	to	25.54

Change in prices are based off of cumulative change in prices resulting from the proposed change in minimum wage

Table 27 b

Changes in Menu Prices for Establishing a $15 Minimum Wage in Minneapolis

			Expected Change in Limited Service Menu Prices				Expected Change in Full Service Menu Prices			
Year	Wage	Annual Change	Annual Change	Confidence Interval			Annual Change	Confidence Interval		
2016	$9.00									
2017	$10.20	13.3%	1.1%	1.1%	to	1.1%	0.53%	0.5%	to	0.6%
2018	$11.41	11.9%	1.0%	1.0%	to	1.0%	0.47%	0.4%	to	0.5%
2019	$12.60	10.4%	0.9%	0.9%	to	0.9%	0.42%	0.4%	to	0.5%
2020	$13.80	9.5%	0.8%	0.8%	to	0.8%	0.38%	0.4%	to	0.4%
2021	$15.00	8.7%	0.7%	0.7%	to	0.7%	0.35%	0.3%	to	0.4%
Cumulative		67%	4.5%	4.4%	to	4.7%	2.2%	2.0%	0	2.3%

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from Allegretto and Reich (2015). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in Table 27

Changes in Menu Prices for Indexing proposed $15 minimum wage in Minneapolis

			Expected Change in Limited Service Menu Prices				Expected Change in Full Service Menu Prices			
Year	Wage	5 Year Wage Change	5 Year Change After Indexing	Confidence Interval			5 Year Change After Indexing	Confidence Interval		
2021	$15.00									
2026	$16.56	10.4%	1.0%	1.0%	to	1.0%	0.40%	0.4%	to	0.4%
2031	$18.28	10.4%	1.0%	1.0%	to	1.0%	0.40%	0.4%	to	0.4%
Cumulative		0%	0.0%	0.0%	to	0.0%	0.0%	0.0%	to	0.0%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to test shocks in the minimum wage in a controlled setting. Because inflation indexing is observable, workers may adjust to changes in their wages differently. Model also assumes no changes in the federal or state minimum wage. Cumulative changes are compounded annually

Expected Price Changes in a $25 Meal from an Indexed $15 Minimum Wage

Sample Menu Schedule		Expected Change in Limited Service Menu Prices				Expected Change in Full Service Menu Prices			
Year	Meal Price	New Price	Confidence Interval			New Price	Confidence Interval		
2021	$25.00	$26.14	26.11	to	26.16	$25.54	25.50	to	25.58
2026	$25.00	$26.40	26.37	to	26.43	$25.65	25.60	to	25.69
2031	$25.00	$26.66	26.62	to	26.70	$25.75	25.69	to	25.80

Change in prices are based off of cumulative change in prices resulting from the proposed change in minimum wage

Industry Workforce

Table 28

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis
By Industry

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Industry		$12	$15	$12	$15	$12	$15	$12	$15
Construction	5,000	1,000	1,000	22%	31%	2%	2%	18%	30%
Manufacturing	12,000	2,000	3,000	17%	29%	4%	5%	11%	16%
Wholesale trade	3,000	0	1,000	16%	21%	1%	1%	12%	24%
Retail trade	19,000	5,000	7,000	29%	39%	12%	11%	17%	29%
Transportation, warehouse, and utilities	9,000	1,000	2,000	15%	21%	3%	3%	14%	27%
Information	8,000	1,000	2,000	11%	20%	2%	2%	15%	19%
Finance, insurance, and real estate	45,000	3,000	5,000	6%	11%	6%	7%	12%	15%
Professional, science, and management services	39,000	2,000	3,000	5%	9%	4%	5%	16%	22%
Administrative and support and waste management services	8,000	3,000	4,000	39%	56%	6%	6%	13%	24%
Educational services	55,000	7,000	11,000	12%	19%	14%	15%	12%	18%
Ambulatory care	17,000	2,000	3,000	11%	18%	4%	4%	12%	16%
Residential care, social assistance, and child day care	17,000	4,000	7,000	26%	41%	9%	10%	13%	21%
Hospitals	22,000	1,000	2,000	4%	9%	2%	3%	12%	13%
Arts, entertainment, and recreation	5,000	1,000	2,000	26%	42%	3%	3%	12%	19%
Restaurants	15,000	8,000	10,000	56%	70%	18%	14%	16%	33%
Other services	10,000	2,000	3,000	21%	33%	5%	5%	13%	19%
Public administration	18,000	0	1,000	1%	5%	0%	1%	12%	6%
Missing/other	5,000	2,000	3,000	44%	57%	5%	4%	12%	27%
Total	**312,000**	**45,000**	**70,000**	**14%**	**22%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- Professional services and educational services are among the largest sectors of the overall workforce in Minneapolis, yet neither is among the most likely to be affected by a citywide increase in the minimum wage
  - Even though they represent a smaller share of the entire workforce, retail, restaurant, and residential care services industries are much more likely to be affected by changes in the minimum wage
  - RWC analysis reveals that non-hospital residential care, hospice care, and child care workers are very likely to be sensitive to changes in the minimum wage
  - Relatively few workers will be earning below $12 to $15 an hour in 2021 in other industries, and variation is wide from industry to industry
    - Only in restaurant and retail was there consistent evidence of workers earning less than $12 to $15 an hour in absence of a citywide minimum wage
  - Restaurant workers are simulated to observe an increase in annual wages of 16% from a $12 minimum wage and 33% from a $15 minimum wage
    - This is consistent with the detailed statistical analysis findings that employee earnings may increase by as much as 15% for $12 minimum wage and 28% for a $15 minimum wage
  - Below is a generalization by sector, rather than industry

Table 29

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Public Sector

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Sector		$12	$15	$12	$15	$12	$15	$12	$15
Federal government	8,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
For profit	196,000	35,000	52,000	18%	26%	74%	73%	14%	23%
Local government	30,000	2,000	5,000	8%	16%	5%	7%	9%	12%
Non profit	53,000	9,000	15,000	18%	28%	20%	21%	14%	20%
State government	23,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	**310,000**	**46,000**	**72,000**	**15%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

n/a represents sample size too small to project projection accurately

- Likewise, for profit firms are most likely to be affected by an increase in the minimum wage, as they are also by far the largest share of the workforce
- Nonprofits represent 17% of the total workforce, and 20% of the minimum wage earning workforce

Occupational Roles of Workers

Table 30

Minimum Wage Workforce for $12/$15 in 2021 in City of Minneapolis

By Occupational Role

	Size of Workforce	Affected Workers		Share of X That Are Affected By MW		Share of MW Workforce That Are X		Average Increase in Annual Wage	
Occupation		$12	$15	$12	$15	$12	$15	$12	$15
Management, business, and finance	67,000	3,000	5,000	4%	8%	6%	8%	13%	17%
Computer, engineering, and science	30,000	1,000	1,000	3%	5%	2%	2%	12%	22%
Community and social services	12,000	2,000	2,000	13%	21%	3%	4%	11%	19%
Legal	9,000	0	1,000	3%	9%	1%	1%	8%	10%
Education	29,000	3,000	6,000	12%	19%	7%	8%	14%	18%
Arts and media	11,000	2,000	3,000	14%	24%	3%	4%	16%	19%
Healthcare practitioners and technical	24,000	1,000	1,000	3%	5%	2%	2%	16%	18%
Healthcare support	6,000	2,000	3,000	24%	45%	3%	4%	7%	13%
Protective services	8,000	1,000	1,000	7%	15%	1%	2%	15%	13%
Food preparation and serving	15,000	8,000	10,000	55%	71%	17%	14%	17%	30%
Building and grounds maintenance	10,000	3,000	5,000	36%	51%	8%	7%	17%	28%
Personal care and service	6,000	3,000	4,000	43%	63%	6%	5%	14%	23%
Sales and related	18,000	5,000	6,000	26%	34%	10%	9%	17%	29%
Office and administrative support	40,000	7,000	12,000	17%	30%	14%	17%	12%	16%
Natural resources, construction, and maintenance	9,000	3,000	4,000	28%	37%	6%	5%	13%	25%
Production, transportation, and material moving	17,000	5,000	7,000	31%	42%	11%	10%	13%	26%
Total	**311,000**	**49,000**	**71,000**	**16%**	**23%**	**100%**	**100%**	**14%**	**22%**

Source: Economic Policy Institute, Metropolitan Council, and American Community Survey

- To clarify, Occupational Role defines the position one holds within an industry, not necessarily the primary service of that industry
- For example, someone could have an occupational role as administrative support, but work at a firm in the construction industry
- "Food preparation" is the largest group of minimum wage earners in relative terms
- "Office administrators" is the largest share of workers likely to be affected by the minimum wage in absolute terms,
- The relative share of the minimum wage earners decreases as the proposed wage increases, indicating that there are fewer people working in the "food services" occupation earning between $12 and $15 an hour

Firm Size and Women- or Minority-Owned Firms

In order to explain the effect of a change in the minimum wage on either minority or women owned enterprises, The RWC team surveyed the Hoovers Dun and Bradstreet database to acquire more detailed information about the firms in Minneapolis. Dun and Bradstreet is a nationwide company that collects information about firms in order to assess their credit risk level for business loans. Dun and Bradstreet identification number is a prerequisite for many government contracts, and for access to many business loans. This ensures that the Dun and Bradstreet sample of enterprises in the Minneapolis area is very large. The research team queried the database in order to get a count of firms that meet the criteria of being located in the city of Minneapolis (and separately for Hennepin/Ramsey County), are in the industry of restaurants (NAICS 722), retail (NAICS 44 and 45), or healthcare (NAICS 62), and if they earned above or below $500,000 in sales receipts in the last year. When RWC refers to "All Industries" it is referring to every industry, and not just these three. In addition, the research team collected information on if the firm is minority owned or women owned, a variable that is tracked in order to determine eligibility for many federal programs. Hoovers' Dun and Bradstreet database also collects data on the number of persons employed by a firm, the year the firm was established, and other industry factors. By surveying the Dun and Bradstreet database of employers in Minneapolis, RWC obtained the number of firms that meet the criterion for using the second-tier minimum wage, i.e., firms with gross revenues less than $500,000. RWC also obtained the share of large and small firms that have either a female or a non-white owner.

In general, we find that women-owned and minority-owned firms are generally slightly more likely to be required to pay the large firm minimum wage currently than their white male

counterparts. This implies that the relative change from the current minimum wage to the proposed minimum wage is likely to be smaller for such firms.

Firm Size in Minneapolis

Table 31

Firms Eligible for $7.75/$9.50 in Minnesota

By Industry

	Share of X in Minneapolis		Share of Minneapolis Firms That Are X		Share of Firms in MN That Are X	
Industry	Large	Small	Large	Small	Large	Small
Retail Trade	16%	15%	19%	81%	18%	82%
Residential Care	30%	25%	18%	82%	16%	84%
Restaurant	23%	19%	22%	78%	18%	82%
Other	22%	15%	18%	82%	13%	87%
All Industries	**22%**	**15%**	**18%**	**82%**	**14%**	**86%**

Source: Dun and Bradstreet - Hoovers

- Fewer firms in Minneapolis are required to pay at least $9.50 than are required to pay at least $7.75
- Being eligible to pay $7.75 does not prevent firms from paying their employees more than $7.75
- Minneapolis has a similar relative share of large to small firms as the rest of Minnesota
- Over one fifth of Minnesota's large employers are located in Minneapolis

Minority Owned Firms in Minneapolis

Table 32

Minority Owned Firms Eligible for $7.75/$9.50 in Minneapolis
By Industry

	Share of X That Are Minority Owned		Share of Minority Owned Firms That Are X		Share of All Firms That Are X	
Industry	Large	Small	Large	Small	Large	Small
Retail Trade	2%	2%	22%	78%	19%	81%
Residential Care	1%	1%	18%	82%	18%	82%
Restaurant	5%	2%	36%	64%	22%	78%
Other	3%	2%	29%	71%	18%	82%
All Industries	**3%**	**2%**	**28%**	**72%**	**18%**	**82%**

Source: Dun and Bradstreet - Hoovers

- A relatively small share of firms in Minneapolis are Minority-owned, despite having a larger share of minority residents
- Minority-owned firms are more likely to be large than their counterparts in the rest of Minnesota
    - This implies that Minority-owned firms are currently more likely to be paying their employees $9.50 an hour than to be paying $7.75 an hour
    - The prevalance of large Minority –owned restaurants is greater than in many other industries

Women Owned Firms in Minneapolis

Table 33

Women Owned Firms Eligible for $7.75/$9.50 in Minneapolis

By Industry

	Share of X That Are Women Owned		Share of Women Owned Firms That Are X		Share of All Firms That Are X	
Industry	Large	Small	Large	Small	Large	Small
Retail Trade	13%	12%	21%	79%	19%	81%
Residential Care	6%	14%	9%	91%	18%	82%
Restaurant	9%	7%	27%	73%	22%	78%
Other	8%	6%	24%	76%	18%	82%
All Industries	**9%**	**8%**	**21%**	**79%**	**18%**	**82%**

Source: Dun and Bradstreet - Hoovers

- The share of Women-owned enterprises in Minneapolis is much smaller than the share of the female workforce in Minneapolis
- Women-owned firms in Minneapolis are slightly more likely to be large than their counterparts in the rest of the state in the restauant, retail, and other industries
    - This implies that Women-owned firms in these industries are more likely to be paying the $9.50 minimum wage than $7.75
- Women-owned residential care firms in Minneapolis are much less likely to be large than in the rest of Minnesota

Firm Size in Hennepin/Ramsey County

Table 34

Firms Eligible for $7.75/$9.50 in Minnesota

By Industry

	Share of X in Hennepin/ Ramsey		Share of Hennepin/ Ramsey Firms That Are X		Share of Firms in MN That Are X	
Industry	Large	Small	Large	Small	Large	Small
Retail Trade	30%	29%	19%	81%	18%	82%
Residential Care	53%	37%	21%	79%	16%	84%
Restaurant	39%	33%	21%	79%	18%	82%
Other	40%	30%	17%	83%	13%	87%
All Industries	**40%**	**31%**	**17%**	**83%**	**14%**	**86%**

Source: Dun and Bradstreet - Hoovers

- Given that 22% of large firms in Minnesota are located in Minneapolis, the fact that 40% of large firms are located in Hennepin/Ramsey County implies that 18% of Minnesota's large firms are located within Hennepin/Ramsey but outside of Minneapolis
- Firms in Hennepin/Ramsey are still slightly more likely to be large than their counterparts in the rest of the state
    - This implies that the average firm in Hennepin/Ramsey is slightly more likely to already be paying their employee $9.50, and not $7.75

Minority Owned Firms in Hennepin/Ramsey County

Table 35

Minority Owned Firms Eligible for $7.75/$9.50 in Hennepin/Ramsey
By Industry

	Share of X That Are Minority Owned		Share of Minority Owned Firms That Are X		Share of All Firms That Are X	
Industry	Large	Small	Large	Small	Large	Small
Retail Trade	13%	12%	20%	80%	19%	81%
Residential Care	6%	12%	11%	89%	21%	79%
Restaurant	9%	8%	24%	76%	21%	79%
Other	10%	5%	30%	70%	17%	83%
All Industries	**10%**	**6%**	**25%**	**75%**	**17%**	**83%**

Source: Dun and Bradstreet - Hoovers

- Minority-owned restaurants retailers and other firms are slightly more likely to be large in Minneapolis than in the rest of Hennepin County (28% Minneapolis vs. 25% in Hennepin/Ramsey County for All Industries)

Women-Owned Firms in Hennepin/Ramsey County

Table 36

Women Owned Firms Eligible for $7.75/$9.50 in Hennepin/Ramsey
By Industry

	Share of X That Are Women Owned		Share of Women Owned Firms That Are X		Share of All Firms That Are X	
Industry	Large	Small	Large	Small	Large	Small
Retail Trade	12%	12%	20%	80%	19%	81%
Residential Care	5%	12%	11%	89%	21%	79%
Restaurant	8%	6%	23%	77%	21%	79%
Other	9%	6%	22%	78%	17%	83%
All Industries	**9%**	**7%**	**20%**	**80%**	**17%**	**83%**

Source: Dun and Bradstreet - Hoovers

- Women-owned restaurants and retailers are larger in Minneapolis than in the rest of Hennepin/Ramsey County
- Likewise, large firms are more likely to be owned by women in Minneapolis than in the rest of Hennepin/Ramsey County

CHANGES IN EMPLOYMENT AND EARNINGS BY SECTOR—BRIEF

The Roy Wilkins Center evaluated three peer-reviewed papers on the topic of changes in employment and earnings to simulate the economic impacts of a citywide minimum wage. Each of these papers measures the change in average employee earnings and the change in workforce participation in a selected industry after a change in the minimum wage. A confidence interval of 95% is included to show how certain each model can identify the changes in employment or earnings as coming directly from the change in the minimum wage. If 0% falls within the confidence interval, it implies that changes in employment or employee earnings were not statistically significantly tied to the change in the minimum wage. Because the scope of our analysis was to rely on existing methodology to assess the impact of a change in the minimum wage, we limit our statistical analysis to industries where a relatively large share of the workforce earns the minimum wage.

Changes in Employment and Earnings by Sector

The Roy Wilkins Center collected three peer reviewed papers to simulate the economic impacts of a citywide minimum wage. Each of these papers measures the changes in employee earnings or employment relative to a change in the minimum wage using different methodologies. The main models were selected and are used in this section to make inference on the impacts on employment and earnings.

Tables 38 and 39 reports the four main models representing changes within three industries: restaurant, retail and healthcare and social assistance industry. To sum up the methodologies, Allegretto, Dube, Reich, and Zipperer - ADRZ (2015) uses the differences on the minimum wages for contiguous counties, each one belonging to a different state using Quarterly Census of

Employment and Wages - QCEW data. Neumark, Salas, and Wascher - NSW (2014) compare counties with similar teen employment. Finally, the research team adjusted the model by Dube, Lester, and Reich - DLR (2015) to calculate the relative change in employment and earnings for respondents to the Current Population Survey, which allows measurement of race, ethnicity, gender, and other demographic factors.

PRIOR STUDIES

What the Literature Studies

- Pretax income
- Participation in workforce
- State changes in minimum wage
- Restaurants, Retail industries
- Teenage employment
- Race/ethnicity
- Level of education
- County population
- Changes over long periods of time
- Employment and earnings at a local level
- Quarterly employee earnings

What the Literature Doesn't Study

- Total hours worked
- Salary vs. Hourly pay
- Differences in state and county/city minimum wages
- Employment or earnings for the entire workforce
- How many jobs will there be in five years?
- Distribution of earnings
- Position in company
- Earnings for each minimum wage earner
- Hours worked "off the books"
- Exemptions or tiers of wages

Restaurants

The restaurant industry represents the group with the largest prevalence of minimum wage earners in the Minneapolis area. Each model agrees that a change in the minimum wage would increase earnings for restaurant workers, but disagree to what degree. The projected employment effect on the restaurant industry varies from model to model. Only one model reports a decrease in

employment while the remaining models forecast no additional job loss/creation from a change in the minimum wage.

Retail

The retail industry represents the second largest set of workers in Minneapolis where the minimum wage is prevalent. The results from these simulations have a wider range of uncertainty for the change in earnings from a minimum wage. This makes it difficult to get a narrow estimate, but also implies that many other factors likely contribute to the earnings of retail workers.

The retail industry's employment effects fall within a narrower range than the restaurant industry. The degree of the employment change varies from model to model but many of the simulations still suggest no statistically significant change that can be directly attributable to the minimum wage: two models predict no change in employment while the remaining models predict a small change in employment.

Health

The health care industry represents a substantially large share of workers that are proportionally affected by changes in the minimum wage. This industry represents at-home care workers, elderly care facility workers, and social assistance workers. Although current economic literature has not explored this industry, the research team simulated changes in earnings and employment using the same models as a starting point. The estimates of the changes in earnings and on employment are the widest of any models tested. One explanation of this result is that the most workers in the health care sector earning the minimum wage do not work in hospitals. Because non hospital health care reimbursements are often negotiated on a multi-year basis with government and because the assisted care industry is heavily dependent on care from other sectors, it may take longer to respond to changes in the minimum wage. It is also difficult to determine the scope of change in

employment resulting from a change in the minimum wage. Likewise, because hospital workers often earn well above the minimum wage, changes in earnings or employment are more likely to be seen in the at-home care industry, and not among hospital care workers.

DETAILED EFFECTS ON WORKERS

Data and Methodology (includes assumptions and limitations)

To provide an analysis of the effects of a change in the minimum wage on the local economy of both the city of Minneapolis and the surrounding counties, the research team replicates the techniques of studies on changes in the minimum wage from Allegretto et.al. (2015), Dube et.al. (2015) and Neumark et.al. (2014). This section will describe the methodologies and explain how the Roy Wilkins Center used them for simulating the impacts of the $12 and $15 minimum wage.

The Roy Wilkins Center produced three kinds of simulations on the effects of a local minimum wage. First, the research team assembled reproductions of the original models produced by the original authors. Because each author produced several models in each paper, RWC replicated the preferred estimations of each author RWC replicated the methods from these models for the industry that the author originally observed. Then, in order to provide scope, RWC replicated the same analytical techniques using data from other industries that include a relatively high share of minimum wage earners. Then, the research team used EPI estimates to calculate the expected impact of increasing from a minimum wage of $7.25 and $9.00 for small and large firms, respectively, to the proposed $12 and $15 minimum wages. The analysis starts from $7.25 and $9.00 instead of $7.75 and $9.50 respectively because these were the wage rates on January 1 of this year (2016), and the simulation must accommodate growth between the date of release of this report and the end of the current year. In the second simulation, RWC obtained data for additional subpopulations of interest and provided new estimates for Minnesota, Hennepin/Ramsey County and the city of Minneapolis. This data allows for a simulation of the minimum wage on populations at different rates based on race/ethnicity, educational status, or narrow geographical region. Third, RWC reflected the methods from Allegretto et.al. (2015) in order to simulate the change in industry

hires, separations, and turnover rates in response to a change in the minimum wage. This replication relies on county-wide industry data, much of which is limited. Although the literature mainly focuses on employment and wages since data on other variables is scarce and not publicly available, the research team modified the models and created an alternative model to find the effects on turnover rates, hires and separations.

In the next subsections, the research team explains in detail the datasets and empirical strategies used to identify the effects of the minimum wage on the subpopulations of interest, (particularly, the restaurant, retail and healthcare industries for the US, and when data was available for smaller geographical areas). For the latter, the underlying assumption to predict the expected outcomes of a change in the minimum wage in the city of Minneapolis is that the US estimates are valid for any subpopulation and, in particular, the geographical area of analysis.

Allegretto, Dube, Reich, Zipperer (ADRZ, 2015a) QCEW model

The Quarterly Census of Employment and Wages (QCEW) includes a quarterly count of employment and wages reported by employers covering 98 percent of U.S. jobs, available at the county, state and national levels by industry. ADRZ (2015) use data from 1990 to 2014 for 1535 counties and estimates employment and average earnings for the restaurant industry (NAICS 722). The earnings measure is the average rate of pay for restaurant workers by quarter. Notice that QCEW does not include the number of hours worked. The QCEW measures, instead, the average monthly earnings of employees. This means that changes in earnings from the QCEW could be from a change in the hourly wage rate, a change in the hours worked, or both.

One of the main challenges of economic studies literature is to find the right experiment to test the impacts of a change in the minimum wage that does not include the impacts of other changes that happen at the same time. ADRZ (2015) proposes limiting the dataset to counties on

a state border where two states have different minimum wages, in order to test the counterfactual in order to exploit changes on the minimum wage across different states. This paper uses the border discontinuity design to overcome the heterogeneity of the non-random distribution of state minimum wage policies in the U.S. This border discontinuity design is consistent with the methods in the Dube, Lester and Reich (2010) and Allegretto, Dube and Reich (2011).

QCEW allows the authors to identify 568 contiguous counties to estimate of their preferred model. As means of showing robustness of their coefficients, Allegretto et.al. (2015) use three different methods to estimate the effect of a change in the minimum wage on employment and average earnings for the restaurant industry. The first one is the canonical two-way fixed effects model, which relies on the assumption of parallel trends across all states. This approach assumes all such heterogeneity can be explicitly controlled by using common time effects and time-invariant state effects. The second one is the border discontinuity model, which compares contiguous counties across state borders and assumes that neighboring areas make good controls because they are more similar in economic structure and in the shocks they face (DLR, 2015). DLR (2015) paper shows that the border discontinuity design gets rid of the pre-existing trends in the classical Two Way Fixed Effects. The third method is border discontinuity with pair-period effects. The pair-period effect allows the period effects to vary by the pair associated with that county in that observation, and sweeps out all the variation between pairs, and only uses variation within local areas surrounding a policy border. Therefore, this border discontinuity with pair-period effects controls for time-varying heterogeneity in the outcomes across local areas. It is an improvement of the second model.

The model specifications for three methods are same. The dependent variable is log of restaurant employment or the average restaurant earnings, for county i, for the county-pair p, at

time t; controls include log of minimum wage, log of overall population and log of overall private sector employment. The county fixed effects and pair specific time effects are included. Since both sides of the equations measure the natural logarithm of employment and earnings, the estimated coefficient on the minimum wage can be interpreted as the elasticity of the minimum wage on the specific outcome. In other words, coefficients will be interpreted as: a minimum wage increase of 1 percent will increase employment or average earnings on beta percent. The RWC expanded the ADRZ analysis to industries that are of importance in the City of Minneapolis: retail (NAICS 45) and healthcare and social assistance (NAICS 45) sectors. The RWC estimates these three industries separately.

Allegretto et. al. restrict their sample size in estimating the changes in employment and earnings in response to a change in the minimum wage for the following reason: they propose that counties that are on two sides of a shared state border provide the best natural experiment for the impact of the minimum wage. For example, Allegretto et.al. would restrict their sample to include only areas like Cass County and Clay County from North Dakota and Minnesota. They believe that testing the change in employment in Fargo and Moorhead provides a basis for strong estimation because when one of those cities is affected by changes in state regulations governing minimum wage, workers are capable of relocating their jobs to the other side of the border relatively easily. As the authors include in their sample all county borders in the United States, coefficients are interpreted at the national level. Therefore, by adopting these models in the analysis for the City of Minneapolis and Hennepin/Ramsey County, the underlying assumption the RWC makes is that the predicted outcomes of a change in the minimum wage in the U.S. are valid for any subpopulation and, in particular, for smaller geographical areas. Therefore, the predictions are valid for a change in the minimum wage in the city of Minneapolis by adopting the

US coefficient. The OLS standard errors from the estimated models are subject to three distinct sources of possible bias: positive serial correlation in employment at the county level, the treatment variable (minimum wage) is constant within each state, and also, the presence of a single county in multiple pairs along a border segment induces a mechanical correlation across county-pairs and potentially across the entire border segment. To account for all these sources of correlation in the residuals, standard errors are clustered on the state and border segment separately (two-dimensional clustering) and are corrected for arbitrary forms of heteroscedasticity.

Neumark, Salas, and Wascher (NSW, 2014) model

Neumark, Salas, and Wascher (NSW) replicate findings of Dube Lester, and Reich (DLR, 2010) using the Quarterly Census of Employment and Wages (QCEW) data. The authors used for their analysis data from the first quarter of 1990 to the second quarter of 2006. To perform the simulations, the research team used the same sample period as NSW the research team restricted the sample to counties with balanced sample (i.e., counties with no missing values for all of the sample quarters). The latter restriction follows the authors' specifications of their own analysis.

In their preferred specification, they used a synthetic control method. This methodology assumes that the likelihood of the counties in the treatment and control groups of adopting an increase in the minimum wage is the same after controlling (or matching) for certain observable characteristics. Therefore, this method creates a control and treatment group that is very similar in the observable characteristics that the authors determined as relevant. The synthetic control weights were based on residuals including and excluding minimum wage as a matching variable respectively.

Allegretto, Dube, Reich Zipperer (ADRZ, 2015b) CPS model

Using the Current Population Survey - Outgoing Rotation Panel (CPS-ORG) that provides monthly data from 1979 through 2010, the authors estimate the effect of a change in the minimum wage on teen employment and average monthly earnings in the United States. As the authors do, the research team also defines wages as the "reported hourly wage for workers paid hourly wages, or, for other workers, usual weekly earnings divided by usual weekly hours worked", excluding observations with imputations (ADRZ, 2015). They use the canonical model with individual data and include as controls the overall state quarterly unemployment rate, the quarterly teen share of the population and dummies for sex, age, marital status, race, and ethnicity. They also include time and division fixed effects on their preferred model.

Hypothesizing that there are particular subpopulations that are of importance for the City of Minneapolis that the literature has not analyzed, the research team replicated the results that Allegretto et.al. found for the Restaurant, Retail and Healthcare and Social assistance industries separately. Moreover, the fact that CPS contains individualized data, we are able to restrict samples to smaller geographical areas and calculate elasticities on these areas. Particularly, the research team calculated elasticities for Minneapolis-St Paul-Bloomington, MN-WI MSA, and for Hennepin/Ramsey County. Although the research team also uses the canonical model for this approach, it had to get rid of the spatial fixed effects. Also, controls are included at the corresponding geographical area instead of using the state level variation. Notice therefore that the elasticities found under this methodology exploit time variation of the minimum wage. All individual-level regressions are weighted by the basic monthly sample weights or earnings sample weights for employment and wages, respectively.

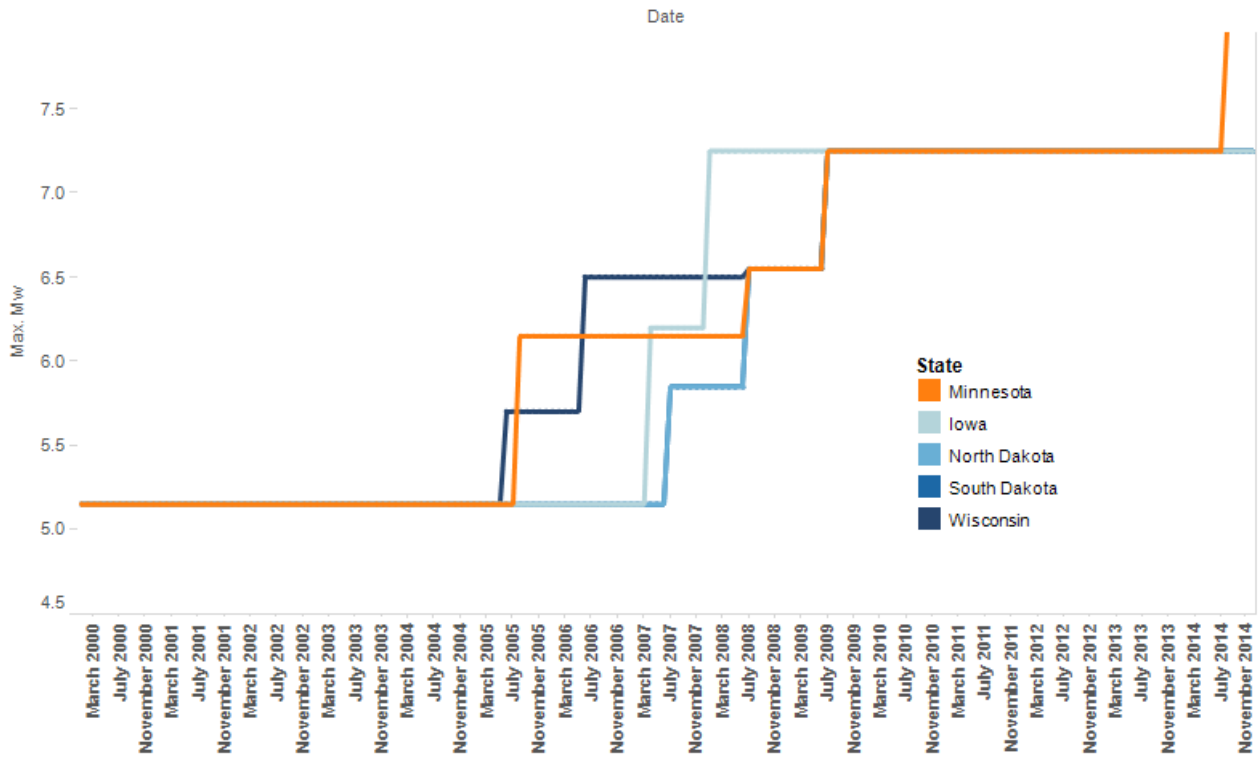
RWC Regional Sensitivity Check (RWC 2016a)

Dube et.al. (2014) used the Quarterly Force Indicators (QWI), which provides matched employer-reported Unemployment Insurance to match employer-employee data on a wide set of variables such as employment, earnings, hires, separations, and turnover rates. However, this dataset is not yet widely available. Therefore, the research team used the data extracts available online having quarterly information by county from 2000-2007. With the available data the research team was able to distinguish data from the three industries of interest: Restaurant, Retail Trade, and Healthcare and Social Assistance. As highlighted by Dube et.al (2014), one of the advantages of QWI over QCEW and CPS is that it provides less error-prone data when calculating the dynamics on the labor market.

In an attempt to estimate effects for Minnesota, the research team exploits the fact that the state increased the minimum wage in the third quarter of 2005, while its adjacent states, namely Iowa, North Dakota, South Dakota and Wisconsin, did not. As shown by Table 37 below, at that date, there is an increase of the minimum wage in Minnesota that lead it to be the state with the highest minimum wage. The research team estimated a difference in differences model for which the before/after comparison is done using the variation between adjacent counties to the state of Minnesota. In other words, the treatment variable is 1 if the county is in the Minnesota. Therefore, by this methodology the research team will find the additional change in the counties located in Minnesota that an increase in the minimum wage produced.

One of the assumptions of using this methodology is that the effects found are applicable for any pair comparison. Therefore, the research team can infer for any smaller geographical area within Minnesota.

Table 37 – Change in the Minimum Wage for the Selected States



Note: Underlying data obtained from Allegretto et.al. (2015).

RWC and EPI Mechanical Simulation (RWC 2016b)

In this simulation, EPI collected population projection estimates for workers in the city of Minneapolis over the next 10 years. These population growth rates provide a baseline for a workforce projection over the five years in which the $12 and $15 wage rate policies are simulated. EPI then supplements this baseline projection with their own model by incorporating projections of population growth rates based on the American Community Survey. EPI then projects average earnings for Minneapolis workers, while accounting for inflation and changes in age and other demographic factors. EPI drops outliers from the ACS, and projects an increase in earnings for the remaining individuals based on their relative relationship to the current minimum wage. This

change represents a change in hourly earnings, and assumes that there is not a change in the number of hours worked. Changes in yearly earnings are not always comparable to changes in hourly earnings, however, because workers' hours are not normally distributed. This implies that total changes in yearly earnings are greater for those who work more hours. Relatively, however, these changes are spread out over more hours a year, implying that the relative change in earnings is smaller for workers with more hours, and greater for workers with fewer hours. The changes in earnings represented above indicate the simulated change in earnings divided by the projected average annual income given there is no policy change. For a detailed explanation of the methods used by EPI to simulate an increase in earnings, see the section of this report titled "Imputing Hourly Wages" in the Economic Policy Institute Simulations section.

It is important to note that this simulation reflects a best case scenario for an increase in the minimum wage, where the wage rate increases but the workforce participation rate and average hours worked do not change. The results from this model should not be considered an econometric test for causality, but as a framing device to estimate the size of the possible earnings effects in a best case scenario.

In the next subsection the research team analyses the results found using the methodologies mentioned above. The research team distinguishes between effects that are applicable to the City of Minneapolis and the Hennepin/Ramsey County.

Effects on Earnings

This section's Appendix Table 38 shows the elasticities for each model by industry and aggregation level. The outcomes analyzed in this document have a trend that is affected by external factors such as worker migration, population shifts, and industry's employment demand, among others. Therefore, the effects to which the research team will make reference to reflect additional

increases on outcomes due to changes in the minimum wage after accounting for the intrinsic change. That is, the research team compares the scenario in which there is an increase in the minimum wage with the scenario in which there is no increase in the minimum wage; the research team takes into account that outcomes would change over time due to other economic determinants. Recall that most of the coefficients reported should be interpreted as elasticities, unless the research team says the contrary. In such cases, the research team will interpret the coefficients as: an increase in 1% in the minimum wage will cause an increase of the indicated percentage on the studied outcome.

From the point of view of workers, an increase in the minimum wage is very likely to affect overall salaries in the industry positively or may not even cause additional increases. The reason is that, although workers earning a salary close to the minimum wage will surely benefit from the change in terms of earnings (assuming they are still employed), it won't necessarily translate into an increase on earnings for the average worker of the industry. In the next two subsections the research team will analyze the effects for the City of Minneapolis and Hennepin/Ramsey County.

Analysis for the City of Minneapolis

As mentioned throughout the methodologies, in order to make inference for the City of Minneapolis and Hennepin/Ramsey County, the research team first assumed that the effect of minimum wage in Minnesota is the same as in the entire U.S. This assumption means that minimum wage workers in these smaller geographical areas do not behave differently to the average minimum wage worker residing in any other average county/city in the U.S. In addition, the research team assumes the elasticity will not change as minimum wage increase, i.e., the starting values do not matter when a percentage change is the same. Later, we rely on the

Minneapolis Metropolitan Area defined in the CPS to identify Minneapolis in the models that use CPS data.

As shown in Appendix Table 38 three out of four models predict an increase on earnings for workers in the restaurant industry due to an increase in the minimum wage. There is just one model that predicts no additional effects on earnings. Notice that the effect then would range between 0%–4.66% increase on earnings due to every 10% increase in the minimum wage. A point to highlight in this discussion is that although an increase from $9 to $12 and $15 corresponds to an increase of 33% and 66% in the minimum wage, the change will take place gradually, achieving its target by 2021. Therefore, the research team must interpret the coefficients carefully. Tables 38 and 46 show the annual expected changes in earnings in scenarios in which the annual change of the minimum wage meet the schedule of increases proposed by EPI.

Workers in the retail industry are equally likely to experience an increase on earnings or not change at all. Two out of four models predict an increase of between 0.76% to 2.35% for every 10% increase in the minimum wage. When analyzing the Healthcare and Social Assistance sectors, the research team sees that three out of four models predict that there will not be a significant change on the average earnings of workers in that sector. Only one model predicts an increase of 23.5%.

Analysis for Hennepin/Ramsey County

Predictions for Hennepin/Ramsey County are similar to the forecast for the city of Minneapolis. Three out of four models predict an increase on earnings in the Restaurant industry while one model suggests that there is no change. Similarly, two out of four models predict an increase on earnings in the retail trade sector, however, the range of the change is wider in these counties. The prediction is that workers residing in these counties may perceive increases of between 0% - 4.32%

for every 10% increase in the minimum wage. On the other hand, the odds of not perceiving any change on earnings for workers in the Healthcare and Social Assistance sector are very high.

Effects on Employment

Although there is quite a clear consensus on the effects of the minimum wage on earnings, it is not the same case in the case of employment. In this section the research team analyzes the effects of the proposed $12 and $15 minimum wage on both, the City of Minneapolis and Hennepin/Ramsey County. The research team cannot provide analysis on labor migration from one industry to another or to one county to another. Therefore, the analysis provided takes into account only partial equilibrium effects. This is because the models discussed are also partial equilibrium models.

Analysis for the City of Minneapolis

Appendix Table 39 presents the results of employment. Panel A presents the results and simulations for the models in the literature plus the modifications that the RWC did and therefore, these coefficients must be interpreted as elasticities. This means that every 1% increase in the minimum wage in a year represents an x% change in employment that same year. Panel B shows the results for the novel estimations of the difference using QWI.

Three out of four models show that increases in the minimum wage will not reduce employment in the restaurant industry in the city of Minneapolis. There is just one model that predicts a decrease of 0.63% on employment for each increase of 10% in the minimum wage. A similar result is found for the Retail trade sector in which the effect of the minimum wage will range between -0.42% to 0% change on local employment for every 10% increase in the minimum wage. Although there are some negative elasticities, estimates that are statistically insignificant should not be considered causal or likely. For the Healthcare and social assistance industry, the

research team doesn't find any statistically significantly negative effect of a change in the minimum wage in terms of employment. Although there is one estimate that is greater than the size of the standard errors in the model, the difference is still not great enough to generate statistical significance.

Analysis for Hennepin and Ramsey County

When analyzing the effects found using current models, the research team finds that there will not likely be any additional effect on employment caused by an increase in the minimum wage.

Panel B of Appendix Table 39 presents the results of the effect from the difference in different models. The research team found an increase in tenure caused by the change in the minimum wage for workers living in Hennepin/Ramsey County. Moreover, there is a decrease in separations measured in QWI as the "estimated number of workers whose job with a given employer ended in the specific quarter". According to the estimations the research team does not expect any significant changes on employment or new hires. In the retail industry, in addition to the effects found to the decrease in turnover rates and separations, the research team also found that there might be a decrease in new hires, which is smaller and less significant than the effect of separations. Finally, in the Healthcare and Social Assistance industry, it is likely there would be an increase in tenure accompanied by an increase in employment after the increase in the minimum wage.

Implication of the Surrounding Areas

Because the Allegretto et al. model uses geographically neighboring county pairs to estimate the impact of a change in the minimum wage, it is better tailored to possible explain the changes of a minimum wage towards neighboring counties. Because their models find no statistically significant change in employment in response to a change in the minimum wage, it implies that

the county with a change in the minimum wage change is statistically indistinguishable from the neighboring county without a minimum wage change with respect to employment.

Neumark et al do not provide as clear a test for the effect of a minimum wage on neighboring counties because they rely on generating synthetic counties from averaging together many counties across the country rather than ones that are confined to the same geographic area. This makes it difficult to interpret their results as having the same county to county comparability.

Theory for Macroeconomic Effects

The research team identifies key industries that are likely to see statistically identifiable changes in the change in employment, employee earnings, and turnover in response to a change in the minimum wage. The research team relies on methods that identify one sector at a time because changes in the entire economy rely on so many factors at any given time that it is statistically impossible to separate the effects of a minimum wage from many other policies, especially when these models generate estimates that are made at the national level. It is for this reason the research team does not have an empirical basis to clearly model macroeconomic general equilibrium effects of a change in the minimum wage. Included here are theoretical foundations for discussing the feasibility of possible effects.

The research team finds that although employment effects may be different from industry to industry, there is consistent reduction in the turnover of workers. The nature of the employee/employer relationship changes in this way after a change in the minimum wage, and hires and separations of workers and employers are more stable after a change in the minimum wage. This provides an important empirical support for a theoretical explanation of when the minimum wage may not hinder the macroeconomic output.

In 2013, Sasaki, Matsuyama, and Sako give a theoretical explanation of the macroeconomic significance of long term stability that may come about through reducing wage inequality through policies like the minimum wage. If employers are worried about fluctuations in their workforce over time, the minimum wage may provide firms with valuable stability from one time to the next, and that a change in the minimum wage does not necessarily lead to a reduction in employment. They caveat, however, that is the minimum wage is too high, it might shift concern from stability to a firm's short term budget.

In this context, if one is convinced by Dube, Lester, and Reich that an increase in the minimum wage leads to a reduction in the turnover rate and if one is convinced by Allegretto, Dube, Lester, and Reich that there is no statistically significant change in employment after an increase in the minimum wage, it would suggest that firms are able to absorb the labor cost of an increase in the minimum wage in the long run by as a way to ensure continue to be involved in the firm. The results from these authors would suggest that increases in the minimum wage would not hinder the macroeconomic output because an increase in the minimum wage increases the employer's confidence that an employee is going to stick around from quarter to quarter, and this confidence is valuable to the employer.

If one is convinced by Neumark, Salas, and Wascher, it would suggest that firms are not able to afford as many employees after an increase in the minimum wage, and that firms cut back in response to an increase in the minimum wage. The results from their model would suggest that firms are bound by their immediate needs more than their long term desire for stability.

Comparison Between Models

The difference in the effects of a minimum wage between models is largely due to the different assumptions used to test for these effects. The Allegretto et. al. (2015) model relies on the

assumption that state borders provide a discontinuity that is important for the sake of policy implementation, but that has little effect on access to resources. Workers from one side of the border can in theory find a job on the other side of the border if their job is eliminated. For example, one would measure the change in earnings of workers in Clay County, Minnesota against the change in earnings of workers in Cass County, North Dakota after only Minnesota changes its minimum wage. This assumption allows for the possibility that workers observe the labor market on the other side of the state border, while both areas appeal to the same labor market because both are within driving distance of each other.

The Neumark et. al. (2014) model relies on the assumption that teenagers are representative of the minimum wage workforce because a high rate of teenagers earns the minimum wage. Neumark et. al. also use synthetic controls based on teenage workforce participation to control for economic factors. This synthetic control generates "synthetic counties" for the sake of comparison that have similar characteristics as the county with increased minimum wage by creating a weighted average from a list of similar counties across the country. To continue with the Clay County example, Clay County is compared to a weighted average of 50 counties throughout the country, three of which are in Minnesota, three in Illinois, four are in Indiana, with many more remaining throughout the nation.

NSW (2014) argues that controlling for geographic factors (like ADRZ) removes too much useful information from the estimation. ADRZ argues that using other methods of analysis that are not fundamentally tied to geography (e.g. LASSO) still support the finding that geography plays an important role in determining the economic conditions of a region, and that in light of existing geographic trends, the minimum wage plays a relatively small role in determining workforce participation.

If a model has a statistically significant results does not necessarily make that model more or less reliable than another model. One should view the results of these three models as a projection of the authors' results to create the closest representation of their findings. It is important to note that these findings rely on the authors' modeling. If one model suggests no statistically significant results, and another model does, it would not follow that averaging the two would be any "closer" to reality. Instead, conflicting results imply that the authors' initial assumptions play an important role in determining the size of the effect. Neumark, Salas, and Wascher tend to find relatively small employee earnings effects and a statistically significant decrease in employed persons. Allegretto, Dube, Reich, and Zipperer tend to find that employee earnings effects are larger and that changes in employment are statistically insignificant. Choosing between these two results depends on weighing one's view of how aptly teen workers represent the minimum wage earning workforce against the importance one places on geography in predicting the impact of a minimum wage. If one believes that geographical proximity plays an important role in determining the response to the minimum wage, then ADRZ and DLR would represent the most likely outcome. If one does not believe this, one may be more convinced by NSW.

Each of these models relies on a sufficient number of observations for employees between industries and between geographic locations. These models were initially presented as estimations for changes in the federal minimum wage, however geographic specificity in the CPS allows the RWC team to simulate their results on a smaller scale. This requires, however, that we limit our analysis to the sectors of the economy where there are relatively large shares of workers earning the minimum wage, such that any sensitivity to the change in the minimum wage would be relatively easy to find.

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Appendix for Economic Analysis

Notes: EPI estimates do not employ analytical econometric techniques and should not be interpreted as measures that address causal effects of the policy. They are included as framing for a best-case scenario, where wages increase according to EPI's schedule, but workforce participation and hours are unchanged.

The Roy Wilkins Center estimating the effect of a change in the minimum wage using a sample of the Minneapolis Metropolitan Area or Hennepin/Ramsey County, rather than rely on national samples, produces estimates relatively close to EPI's effective impact estimate. These estimates also rely on border definitions of the Minneapolis MSA and the categorization of Hennepin/Ramsey *County* which have changed in the CPS over time.

Table 38

The Effect of the Minimum Wage Increases on Earnings Minneapolis; Hennepin & Ramsey County

Author (year)	Aggregation level	Dataset	Effect	S.E.
Restaurant industry				
Dube et.al.. (2010) ; Allegretto et.al.. (2015a)	US	QCEW	0.208***	0.062
Neumark et.al.. (2004)	US #	CPS	0.26	0.160
Allegretto et.al. (2015b)	US	CPS	0.242***	0.044
Allegretto et.al. (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	0.466***	0.107
Allegretto et.al. (2015b)	Hennepin/Ramsey County ‡	CPS	0.516***	0.063
EPI $12 (2016)	Minneapolis (PUMA only)	ACS	0.581	n/a
EPI $15 (2016)	Minneapolis (PUMA only)	ACS	0.646	n/a
Retail industry				
Dube et.al.. (2010) ; Allegretto et.al.. (2015a)	US	QCEW	-0.019	0.080
Neumark et.al.. (2004)	US #	CPS	0.26	0.160
Allegretto et.al. (2015b)	US	CPS	0.076**	0.033
Allegretto et.al. (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	0.235*	0.127
Allegretto et.al. (2015b)	Hennepin/Ramsey County ‡	CPS	0.432***	0.055
EPI $12 (2016)	Minneapolis (PUMA only)	ACS	0.623	n/a
EPI $15 (2016)	Minneapolis (PUMA only)	ACS	0.616	n/a
Healthcare and social assistance				
Dube et.al.. (2010) ; Allegretto et.al.. (2015a)	US	QCEW	0.089	0.068
Neumark et.al.. (2004)	US #	CPS	0.26	0.160
Allegretto et.al. (2015b)	US	CPS	0.021	0.040
Allegretto et.al. (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	0.251***	0.096
Allegretto et.al. (2015b)	Hennepin/Ramsey County ‡	CPS	0.607***	0.060
EPI $12 (2016)	Minneapolis (PUMA only)	ACS	0.499	n/a
EPI $15 (2016)	Minneapolis (PUMA only)	ACS	0.373	n/a

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
† Minneapolis - St. Paul - Bloomington, MN-WI data available after year 2004 in CPS outgoing rotation panel
‡ Hennepin County was identified as the "unknown" county after year 2004
# Neumark estimates derived from earnings near minimum wage for all industries

Table 39

The Effect of the Minimum Wage Increases on Labor Force Participation (LFP): Minneapolis; Hennepin/Ramsey County

Panel A: Effects on workforce participation

Author (year)	Aggregation level	Dataset	Outcome	Effect	S.E.
Restaurant industry					
Dube et.al.. (2010) ; Allegretto et.al.. (2015a)	US	QCEW	LFP	0.021	0.129
Neumark et.al. (2014)	US	QCEW	LFP	-0.063***	0.022
Allegretto et.al. (2015b)	US	CPS	LFP	0.009	0.009
Allegretto et.al. (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	LFP	-0.0369	0.0791
Allegretto et.al. (2015b)	Hennepin/Ramsey County ‡	CPS	LFP	0.0372	0.0509
EPI (2016)	Minneapolis (PUMA only)	ACS	LFP	n/a	n/a
Retail industry					
Dube et.al.. (2010) ; Allegretto et.al.. (2015a)	US	QCEW	LFP	0.062	0.099
Neumark et.al. (2014)	US	QCEW	LFP	-0.042**	0.017
Allegretto et.al. (2015b)	US	CPS	LFP	-0.031	0.027
Allegretto et.al. (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	LFP	-0.0415	0.06
Allegretto et.al. (2015b)	Hennepin/Ramsey County ‡	CPS	LFP	-0.0503	0.032
EPI (2016)	Minneapolis (PUMA only)	ACS	LFP	n/a	n/a
Healthcare and social assistance					
Dube et.al.. (2010) ; Allegretto et.al.. (2015a)	US	QCEW	LFP	-0.203	0.148
Neumark et.al. (2014)	US	QCEW	LFP	-0.006	0.018
Allegretto et.al. (2015b)	US	CPS	LFP	0.009	0.028
Allegretto et.al. (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	LFP	0.0151	0.0369
Allegretto et.al. (2015b)	Hennepin/Ramsey County ‡	CPS	LFP	-0.00859	0.0211
EPI (2016)	Minneapolis (PUMA only)	ACS	LFP	n/a	n/a

Panel B: Effects on employment

Author (year)	Aggregation level	Dataset	Outcome	Effect	S.E.
Restaurant industry					
Dube et.al.. (2015)	Minnesota county border	QWI	Turnover rate	-0.018***	0.002
Dube et.al.. (2015)	Minnesota county border	QWI	Jobs	0.017	0.047
Dube et.al.. (2015)	Minnesota county border	QWI	Hires	-0.056	0.04
Dube et.al.. (2015)	Minnesota county border	QWI	Separations	-0.073*	0.039
Retail industry					
Dube et.al.. (2015)	Minnesota county border	QWI	Turnover rate	-0.009***	0.001
Dube et.al.. (2015)	Minnesota county border	QWI	Jobs	0.024	0.016
Dube et.al.. (2015)	Minnesota county border	QWI	Hires	-0.062***	0.014
Dube et.al.. (2015)	Minnesota county border	QWI	Separations	-0.072***	0.014
Healthcare and social assistance					
Dube et.al.. (2015)	Minnesota county border	QWI	Turnover rate	-0.003***	0.001
Dube et.al.. (2015)	Minnesota county border	QWI	Jobs	0.113***	0.032
Dube et.al.. (2015)	Minnesota county border	QWI	Hires	0.015	0.025
Dube et.al.. (2015)	Minnesota county border	QWI	Separations	0.03	0.025

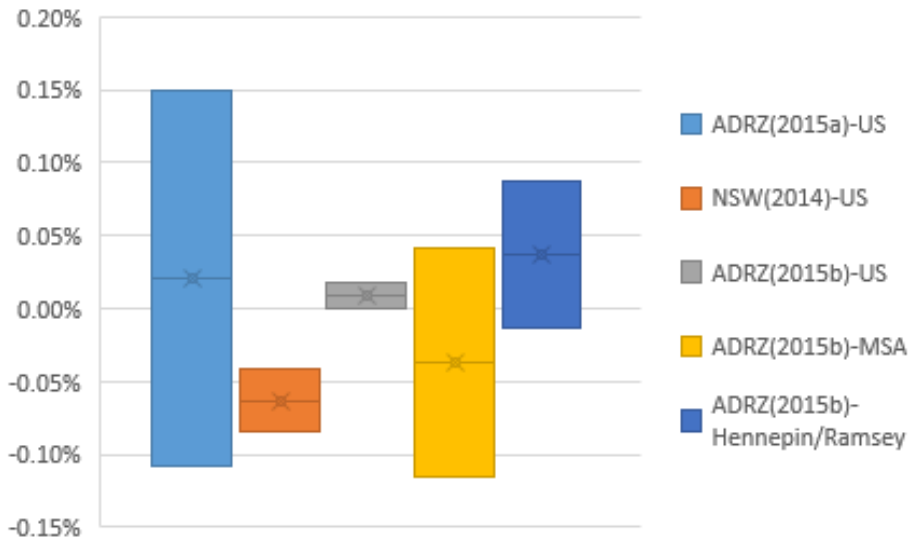
Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
† Minneapolis - St. Paul - Bloomington, MN-WI data available after year 2004 in CPS outgoing rotating panel
‡ Hennepin County was identified as the "unknown" county after year 2004
LFP is short for Labor Force Participation
In Dube et.al.. (2015), QWI Jobs measures number of persons from the Quarterly Workforce Indicator dataset matched with employers per quarter, allowing for one individual to have many different employers

Workforce Participation Results in Graphical Representation

Note: The center of each bar reflects the best estimate of the effects of a 1% minimum wage increase in a year for each model. The edged of the bars represent the 95% confidence interval of these estimates. If these intervals cross the 0% line, the implied results are not statistically significant, and the research team cannot reject the possibility that a 1% increase in the minimum wage has no measureable effect on the stated variable.

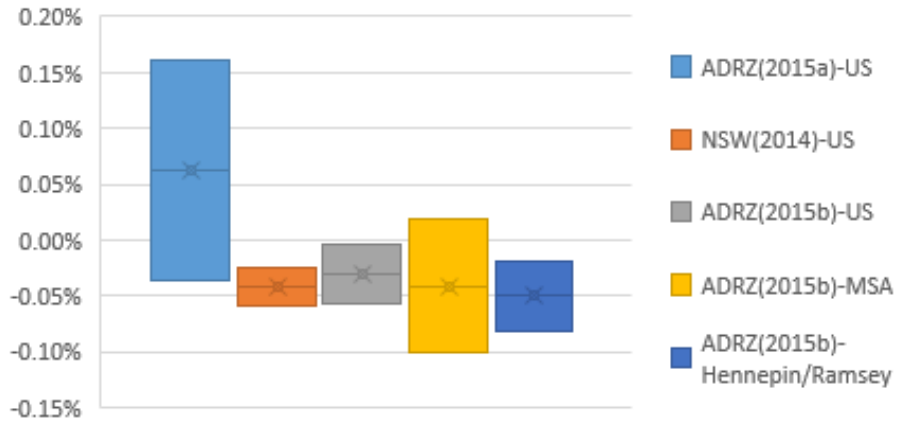
It is also important to remember that these estimates predict one industry at a time, and does not make any implications on willingness to work or transfer from one industry to another. Also, these models only seek to address average changes in earnings or workforce participation. It is possible that individuals may see large changes for themselves, but others see no change. Finally, it is important to remember that average earnings calculations reflect quarterly earnings, which is the product of the wage rate, hours worked in a week, and weeks worked in a three-month period. This implies that the interpretation of an increase in earnings should be considered an increase in take home pay, and not just an increase in hourly pay. In other words, it is possible that positive earnings effects could come from an increase in hourly wage, an increase in hours worked, an increase in weeks worked, or some combination of the above. It is possible that hours worked per quarter decreases, but earnings may still increase if the change in the wage rate is greater than the change in hours worked.

Table 40 – Percent Change in Workforce Participation for Restaurants given 1% Change in MW



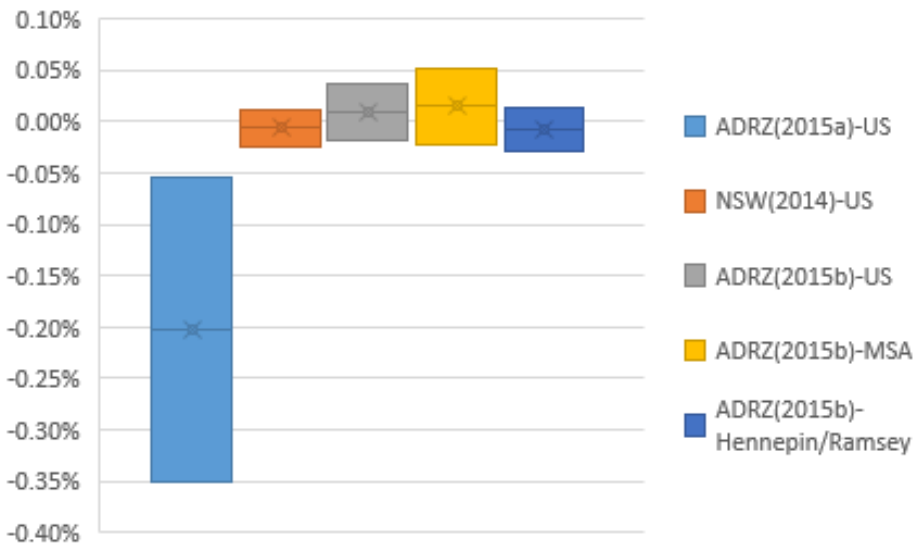
- Most models tested cross the 0% line, suggesting the possibility that there is no significant change in workforce participation
    - NSW (2014) is the only model that anticipates a measurable and negative relationship between workforce participation and the minimum wage
- More narrow geographical regions have wider confidence intervals, implying that the estimates are less clearly linked to changes in the minimum wage
    - One explanation for this is that a large share of workforce participation is determined by trends within a locality

Table 41 – Percent Change in Workforce Participation for Retail Given 1% Change in MW



- Models estimate more consistently negative workforce effects for the retail industry, but the size of the effects is smaller than for the restaurant industry

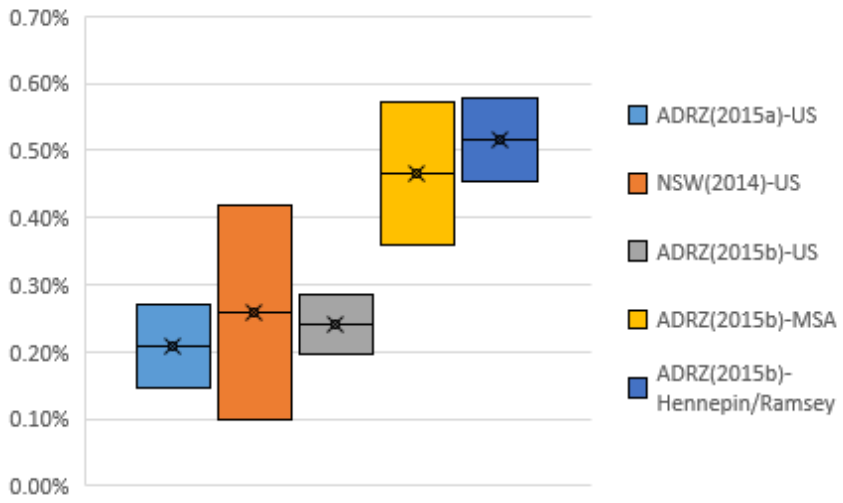
Table 42 – Percent Change in Workforce Participation for Health Industry Given 1% Change in MW



- Most models have no statistically significant predictions for a change in workforce participation

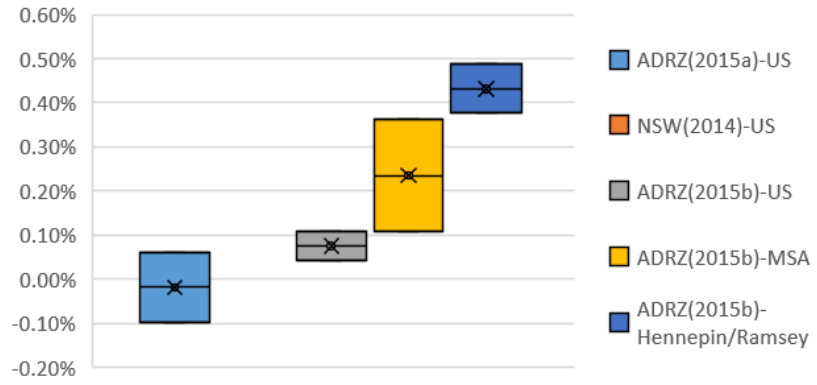
Earnings Effects in Graphical Representation

Table 43 – Percent Change in Earnings for Restaurants Given a 1% Change in MW



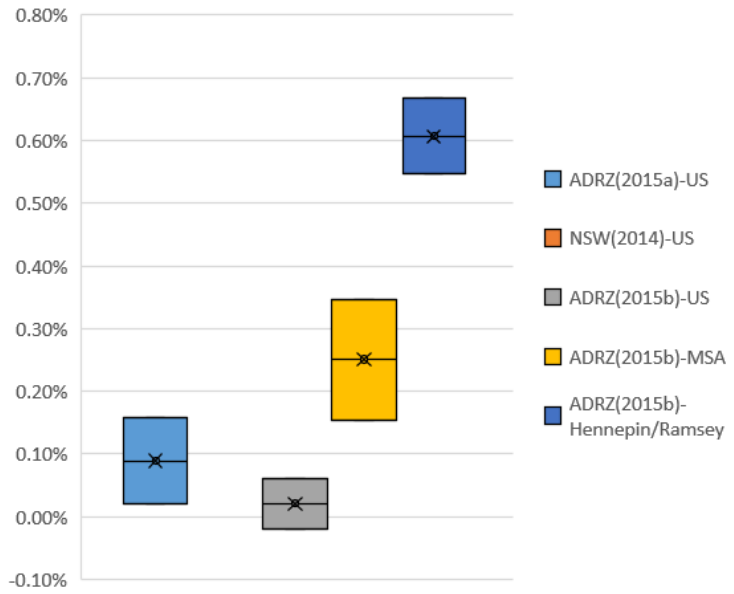
- All models predict some positive earnings effects, though to differing degrees
- Earnings estimates seem greater in more specific regions than in the country as a whole

Table 44 – Percent Change in Earnings for Retail Given a 1% Change in MW



- NSW 2014 and NSW 2004 not shown because earnings estimates are only calculated for restaurants
- Earnings estimates are generally positive and significant

Table 45 – Percent Earnings Change for Health Industry Given a 1% Change in MW



- NSW 2014 and NSW 2004 not shown because earnings estimates are only calculated for restaurants
- Range of estimates are much wider for health industry than other industries
- Most models predict positive and significant earnings increases

Changes in Earnings from Simulated Minimum Wage

Table 46

The Effect of the Minimum Wage Increases on Earnings Minneapolis ; Hennepin & Ramsey Counties

Author (year)	Aggregation level	Dataset	Earnings Change from $12	Earnings Change from $15
Restaurant industry				
Dube et al. (2010) ; Allegretto et al. (2015a)	US	QCEW	6.3%***	11.7%***
Neumark et al. (2004)	US #	CPS	7.90%	14.80%
Allegretto et al (2015b)	US	CPS	7.4%***	13.7%***
Allegretto et al (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	14.6%***	27.7%***
Allegretto et al (2015b)	Hennepin/Ramsey counties ‡	CPS	16.2%***	31.0%***
EPI (2016) {For Context}	Minneapolis (PUMA only)	ACS	16.24%	33.32%
Retail industry				
Dube et al. (2010) ; Allegretto et al. (2015a)	US	QCEW	-0.60%	-1.00%
Neumark et al. (2004)	US #	CPS	n/a	n/a
Allegretto et al (2015b)	US	CPS	2.3%**	4.2%**
Allegretto et al (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	7.2%*	13.3%*
Allegretto et al (2015b)	Hennepin/Ramsey counties ‡	CPS	13.5%***	25.5%***
EPI (2016) {For Context}	Minneapolis (PUMA only)	ACS	17.27%	28.63%
Healthcare and social assistance				
Dube et al. (2010) ; Allegretto et al. (2015a)	US	QCEW	2.70%	4.90%
Neumark et al. (2004)	US #	CPS	n/a	n/a
Allegretto et al (2015b)	US	CPS	0.60%	1.10%
Allegretto et al (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	7.7%***	14.3%***
Allegretto et al (2015b)	Hennepin/Ramsey counties ‡	CPS	19.3%***	37.2%***
EPI (2016) {For Context}	Minneapolis (PUMA only)	ACS	13.25%	20.83%

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
† Minneapolis - St. Paul - Bloomington, MN-WI data available after year 2004 in CPS outgoing rotating panel
‡ Hennepin county was identified as the "unknown" county after year 2004

- Results reflect the average change in quarterly earnings
- Statistical significance of elasticity's based on elasticity and not total change

Changes in Employment from Simulated Minimum Wage

Table 47

The Effect of the Minimum Wage Increases on Workforce Participation Minneapolis ; Hennepin & Ramsey Counties

Author (year)	Aggregation level	Dataset	Outcome	Workforce Changefrom $12	Workforce Change from $15
Panel A: Effects on workforce participation					
Restaurant industry					
Dube et al. (2010) ; Allegretto et al. (2015a)	US	QCEW	WFP	0.60%	1.10%
Neumark et al (2014)	US	QCEW	WFP	-1.9%***	-3.3%***
Allegretto et al (2015b)	US	CPS	WFP	0.30%	0.50%
Allegretto et al (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	WFP	-1.10%	-2.00%
Allegretto et al (2015b)	Hennepin/Ramsey counties ‡	CPS	WFP	1.10%	2.00%
EPI (2016)	Minneapolis (PUMA only)	ACS	WFP	n/a	n/a
Retail industry					
Dube et al. (2010) ; Allegretto et al. (2015a)	US	QCEW	WFP	1.80%	3.40%
Neumark et al (2014)	US	QCEW	WFP	n/a	n/a
Allegretto et al (2015b)	US	CPS	WFP	-1.20%	-2.20%
Allegretto et al (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	WFP	-1.20%	-2.20%
Allegretto et al (2015b)	Hennepin/Ramsey counties ‡	CPS	WFP	-1.50%	-2.70%
EPI (2016)	Minneapolis (PUMA only)	ACS	WFP	n/a	n/a
Healthcare and social assistance					
Dube et al. (2010) ; Allegretto et al. (2015a)	US	QCEW	WFP	-5.90%	-10.50%
Neumark et al (2014)	US	QCEW	WFP	n/a	n/a
Allegretto et al (2015b)	US	CPS	WFP	-0.20%	-0.30%
Allegretto et al (2015b)	Minneapolis-St Paul-Bloomington, MN-WI †	CPS	WFP	0.40%	0.80%
Allegretto et al (2015b)	Hennepin/Ramsey counties ‡	CPS	WFP	-0.30%	-0.50%
EPI (2016)	Minneapolis (PUMA only)	ACS	WFP	n/a	n/a

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
† Minneapolis - St. Paul - Bloomington, MN-WI data available after year 2004 in CPS outgoing rotating panel
‡ Hennepin county was identified as the "unknown" county after year 2004

- Results reflect the average change in workforce participation (WFP)
- Statistical significance of elasticities based on elasticity and not total change
- Only one model finds statistically significant results
- Even most non zero results are statistically indistinguishable from 0, and the research team cannot reject the hypothesis that there is no effect
- Healthcare effects have wide confidence intervals, implying difficulty identifying cause for changes of employment during sample time

95% Confidence Range of Restaurant Industry Effects using US Sample (DLR, ADRZa)

Table 47 a

Changes in Restaurant Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	1.4%	0.6% to 2.2%	0.14%	-1.5% to 1.8%
2018	$10.20	6.3%	1.3%	0.5% to 2.1%	0.13%	-1.4% to 1.7%
2019	$10.80	5.9%	1.2%	0.5% to 1.9%	0.12%	-1.4% to 1.6%
2020	$11.40	5.6%	1.2%	0.5% to 1.8%	0.12%	-1.3% to 1.5%
2021	$12.00	5.3%	1.1%	0.5% to 1.7%	0.11%	-1.2% to 1.4%
Cumulative		**33.3%**	**6.3%**	**2.6% to 10.1%**	**0.6%**	**-6.7% to 8.4%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by model from Allegretto et al. (2015a). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	2.5%	1.0% to 4.0%	0.21%	-2.3% to 2.8%
2031	$14.63	21.9%	5.1%	2.1% to 8.2%	0.42%	-4.5% to 5.6%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the real minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47 b

Changes in Restaurant Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	2.8%	1.2% to 4.4%	0.28%	-3.1% to 3.7%
2018	$11.40	11.8%	2.4%	1.0% to 3.9%	0.25%	-2.7% to 3.2%
2019	$12.60	10.5%	2.2%	0.9% to 3.5%	0.22%	-2.4% to 2.9%
2020	$13.80	9.5%	2.0%	0.8% to 3.1%	0.20%	-2.2% to 2.6%
2021	$15.00	8.7%	1.8%	0.8% to 2.9%	0.18%	-2.0% to 2.4%
Cumulative		**66.7%**	**11.7%**	**4.7% to 19.0%**	**1.1%**	**-11.9% to 15.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by the model from Allegretto et al. (2015a). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	2.5%	1.0% to 4.0%	0.21%	-2.3% to 2.8%
2031	$18.28	21.9%	5.1%	2.1% to 8.2%	0.42%	-4.5% to 5.6%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Retail Industry Effects using US Sample (DLR, ADRZa)

Table 47 c

Changes in Retail Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	-0.1%	-1.2% to 0.9%	0.41%	-0.9% to 1.7%
2018	$10.20	6.3%	-0.1%	-1.1% to 0.9%	0.39%	-0.8% to 1.6%
2019	$10.80	5.9%	-0.1%	-1.0% to 0.8%	0.36%	-0.8% to 1.5%
2020	$11.40	5.6%	-0.1%	-1.0% to 0.8%	0.34%	-0.7% to 1.4%
2021	$12.00	5.3%	-0.1%	-0.9% to 0.7%	0.33%	-0.7% to 1.3%
Cumulative		**33.3%**	**-0.6%**	**-5.1% to 4.1%**	**1.8%**	**-3.9% to 7.8%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015a). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	-0.2%	-2.1% to 1.7%	0.62%	-1.3% to 2.6%
2031	$14.63	21.9%	-0.5%	-4.1% to 3.4%	1.25%	-2.6% to 5.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47 d

Changes in Retail Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	-0.3%	-2.3% to 1.8%	0.83%	-1.8% to 3.4%
2018	$11.40	11.8%	-0.2%	-2.1% to 1.6%	0.73%	-1.6% to 3.0%
2019	$12.60	10.5%	-0.2%	-1.9% to 1.5%	0.65%	-1.4% to 2.7%
2020	$13.80	9.5%	-0.2%	-1.7% to 1.3%	0.59%	-1.3% to 2.4%
2021	$15.00	8.7%	-0.2%	-1.5% to 1.2%	0.54%	-1.1% to 2.2%
Cumulative		**66.7%**	**-1.0%**	**-9.1% to 7.6%**	**3.4%**	**-6.9% to 14.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015a). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	-0.2%	-2.1% to 1.7%	0.62%	-1.3% to 2.6%
2031	$18.28	21.9%	-0.5%	-4.1% to 3.4%	1.25%	-2.6% to 5.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Health Industry Effects using US Sample (DLR, ADRZa)

Table 47e

Changes in Health Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	0.6%	-0.3% to 1.5%	-1.35%	-3.3% to 0.6%
2018	$10.20	6.3%	0.6%	-0.3% to 1.4%	-1.27%	-3.1% to 0.5%
2019	$10.80	5.9%	0.5%	-0.3% to 1.3%	-1.19%	-2.9% to 0.5%
2020	$11.40	5.6%	0.5%	-0.2% to 1.2%	-1.13%	-2.7% to 0.5%
2021	$12.00	5.3%	0.5%	-0.2% to 1.2%	-1.07%	-2.6% to 0.5%
Cumulative		**33.3%**	**2.7%**	**-1.3% to 6.8%**	**-5.9%**	**-13.8% to 2.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Allegretto et al. (2015a). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	1.1%	-0.5% to 2.7%	-2.01%	-4.8% to 0.9%
2031	$14.63	21.9%	2.2%	-1.1% to 5.5%	-3.99%	-9.4% to 1.8%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47f

Changes in Health Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	1.2%	-0.6% to 3.0%	-2.71%	-6.6% to 1.2%
2018	$11.40	11.8%	1.0%	-0.5% to 2.6%	-2.39%	-5.8% to 1.0%
2019	$12.60	10.5%	0.9%	-0.5% to 2.3%	-2.14%	-5.2% to 0.9%
2020	$13.80	9.5%	0.8%	-0.4% to 2.1%	-1.93%	-4.7% to 0.8%
2021	$15.00	8.7%	0.8%	-0.4% to 1.9%	-1.77%	-4.3% to 0.8%
Cumulative		**66.7%**	**4.9%**	**-2.4% to 12.6%**	**-10.5%**	**-23.9% to 4.8%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Allegretto et al. (2015a). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Dube et al. (2010)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	1.1%	-0.5% to 2.7%	-2.01%	-4.8% to 0.9%
2031	$18.28	21.9%	2.2%	-1.1% to 5.5%	-3.99%	-9.4% to 1.8%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Restaurant Industry Effects using US Sample (ADRZb)

Table 47g

Changes in Restaurant Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	1.6%	1.0% to 2.2%	0.06%	-0.1% to 0.2%
2018	$10.20	6.3%	1.5%	1.0% to 2.1%	0.06%	-0.1% to 0.2%
2019	$10.80	5.9%	1.4%	0.9% to 1.9%	0.05%	-0.1% to 0.2%
2020	$11.40	5.6%	1.3%	0.9% to 1.8%	0.05%	0.0% to 0.1%
2021	$12.00	5.3%	1.3%	0.8% to 1.7%	0.05%	0.0% to 0.1%
Cumulative		**33.3%**	**7.4%**	**4.7% to 10.1%**	**0.3%**	**-0.3% to 0.8%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	2.9%	1.9% to 4.0%	0.09%	-0.1% to 0.3%
2031	$14.63	21.9%	6.0%	3.8% to 8.2%	0.18%	-0.2% to 0.5%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47h

Changes in Restaurant Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	3.2%	2.1% to 4.4%	0.12%	-0.1% to 0.4%
2018	$11.40	11.8%	2.8%	1.8% to 3.9%	0.11%	-0.1% to 0.3%
2019	$12.60	10.5%	2.5%	1.6% to 3.5%	0.09%	-0.1% to 0.3%
2020	$13.80	9.5%	2.3%	1.5% to 3.1%	0.09%	-0.1% to 0.3%
2021	$15.00	8.7%	2.1%	1.4% to 2.9%	0.08%	-0.1% to 0.2%
Cumulative		**66.7%**	**13.7%**	**8.7% to 19.0%**	**0.5%**	**-0.5% to 1.4%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	2.9%	1.9% to 4.0%	0.09%	-0.1% to 0.3%
2031	$18.28	21.9%	6.0%	3.8% to 8.2%	0.18%	-0.2% to 0.5%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Restaurant Industry Effects using US Sample (ADRZb)

Table 47i

Changes in Retail Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	0.5%	0.1% to 0.9%	-0.28%	-0.5% to -0.1%
2018	$10.20	6.3%	0.5%	0.1% to 0.9%	-0.26%	-0.5% to -0.1%
2019	$10.80	5.9%	0.4%	0.1% to 0.8%	-0.25%	-0.4% to -0.1%
2020	$11.40	5.6%	0.4%	0.1% to 0.8%	-0.23%	-0.4% to 0.0%
2021	$12.00	5.3%	0.4%	0.1% to 0.7%	-0.22%	-0.4% to 0.0%
Cumulative		**33.3%**	**2.3%**	**0.3% to 4.2%**	**-1.2%**	**-2.2% to -0.3%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	0.9%	0.1% to 1.7%	-0.42%	-0.8% to -0.1%
2031	$14.63	21.9%	1.8%	0.3% to 3.4%	-0.84%	-1.5% to -0.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47j

Changes in Retail Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	1.0%	0.2% to 1.9%	-0.56%	-1.0% to -0.1%
2018	$11.40	11.8%	0.9%	0.1% to 1.7%	-0.49%	-0.9% to -0.1%
2019	$12.60	10.5%	0.8%	0.1% to 1.5%	-0.44%	-0.8% to -0.1%
2020	$13.80	9.5%	0.7%	0.1% to 1.3%	-0.40%	-0.7% to -0.1%
2021	$15.00	8.7%	0.7%	0.1% to 1.2%	-0.37%	-0.7% to -0.1%
Cumulative		**66.7%**	**4.2%**	**0.6% to 7.8%**	**-2.2%**	**-4.0% to -0.5%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	0.9%	0.1% to 1.7%	-0.42%	-0.8% to -0.1%
2031	$18.28	21.9%	1.8%	0.3% to 3.4%	-0.84%	-1.5% to -0.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Health Industry Effects using US Sample (ADRZb)

Table 47k

Changes in Health Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	0.1%	-0.4% to 0.7%	-0.04%	-0.3% to 0.2%
2018	$10.20	6.3%	0.1%	-0.4% to 0.6%	-0.04%	-0.3% to 0.2%
2019	$10.80	5.9%	0.1%	-0.3% to 0.6%	-0.04%	-0.2% to 0.2%
2020	$11.40	5.6%	0.1%	-0.3% to 0.6%	-0.03%	-0.2% to 0.2%
2021	$12.00	5.3%	0.1%	-0.3% to 0.5%	-0.03%	-0.2% to 0.2%
Cumulative		**33.3%**	**0.6%**	**-1.7% to 3.0%**	**-0.2%**	**-1.2% to 0.9%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	0.3%	-0.7% to 1.2%	-0.06%	-0.4% to 0.3%
2031	$14.63	21.9%	0.5%	-1.4% to 2.4%	-0.12%	-0.8% to 0.6%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47 l

Changes in Health Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	0.3%	-0.8% to 1.3%	-0.08%	-0.6% to 0.4%
2018	$11.40	11.8%	0.2%	-0.7% to 1.2%	-0.07%	-0.5% to 0.3%
2019	$12.60	10.5%	0.2%	-0.6% to 1.0%	-0.06%	-0.4% to 0.3%
2020	$13.80	9.5%	0.2%	-0.5% to 0.9%	-0.06%	-0.4% to 0.3%
2021	$15.00	8.7%	0.2%	-0.5% to 0.9%	-0.05%	-0.4% to 0.3%
Cumulative		**66.7%**	**1.1%**	**-3.1% to 5.5%**	**-0.3%**	**-2.2% to 1.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	0.3%	-0.7% to 1.2%	-0.06%	-0.4% to 0.3%
2031	$18.28	21.9%	0.5%	-1.4% to 2.4%	-0.12%	-0.8% to 0.6%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Restaurant Industry Effects using Metro Sample (ADRZb)

Table 47m

Changes in Restaurant Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	3.1%	1.7% to 4.5%	-0.25%	-1.3% to 0.8%
2018	$10.20	6.3%	2.9%	1.6% to 4.2%	-0.23%	-1.2% to 0.7%
2019	$10.80	5.9%	2.7%	1.5% to 4.0%	-0.22%	-1.1% to 0.7%
2020	$11.40	5.6%	2.6%	1.4% to 3.8%	-0.20%	-1.1% to 0.7%
2021	$12.00	5.3%	2.5%	1.3% to 3.6%	-0.19%	-1.0% to 0.6%
Cumulative		**33.3%**	**14.6%**	**7.8% to 21.7%**	**-1.1%**	**-5.6% to 3.5%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	5.7%	3.1% to 8.4%	-0.37%	-1.9% to 1.2%
2031	$14.63	21.9%	11.8%	6.3% to 17.5%	-0.74%	-3.8% to 2.4%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47n

Changes in Restaurant Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	6.2%	3.4% to 9.0%	-0.49%	-2.6% to 1.6%
2018	$11.40	11.8%	5.5%	3.0% to 7.9%	-0.43%	-2.3% to 1.4%
2019	$12.60	10.5%	4.9%	2.7% to 7.1%	-0.39%	-2.0% to 1.2%
2020	$13.80	9.5%	4.4%	2.4% to 6.4%	-0.35%	-1.8% to 1.1%
2021	$15.00	8.7%	4.1%	2.2% to 5.9%	-0.32%	-1.7% to 1.0%
Cumulative		**66.7%**	**27.7%**	**14.6% to 42.0%**	**-2.0%**	**-9.9% to 6.5%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	5.7%	3.1% to 8.4%	-0.37%	-1.9% to 1.2%
2031	$18.28	21.9%	11.8%	6.3% to 17.5%	-0.74%	-3.8% to 2.4%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Retail Industry Effects using Metro Sample (ADRZb)

Table 47o

Changes in Retail Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	1.6%	-0.1% to 3.2%	-0.28%	-1.1% to 0.5%
2018	$10.20	6.3%	1.5%	-0.1% to 3.0%	-0.26%	-1.0% to 0.5%
2019	$10.80	5.9%	1.4%	-0.1% to 2.8%	-0.24%	-0.9% to 0.4%
2020	$11.40	5.6%	1.3%	-0.1% to 2.7%	-0.23%	-0.9% to 0.4%
2021	$12.00	5.3%	1.2%	-0.1% to 2.5%	-0.22%	-0.8% to 0.4%
Cumulative		**33.3%**	**7.2%**	**-0.4% to 15.2%**	**-1.2%**	**-4.6% to 2.3%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds

Further Changes in Retail Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	2.9%	-0.2% to 5.9%	-0.41%	-1.6% to 0.8%
2031	$14.63	21.9%	5.8%	-0.3% to 12.2%	-0.83%	-3.1% to 1.5%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47p

Changes in Retail Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	3.1%	-0.2% to 6.5%	-0.55%	-2.1% to 1.0%
2018	$11.40	11.8%	2.8%	-0.2% to 5.7%	-0.49%	-1.9% to 0.9%
2019	$12.60	10.5%	2.5%	-0.1% to 5.1%	-0.44%	-1.7% to 0.8%
2020	$13.80	9.5%	2.2%	-0.1% to 4.6%	-0.40%	-1.5% to 0.7%
2021	$15.00	8.7%	2.0%	-0.1% to 4.2%	-0.36%	-1.4% to 0.7%
Cumulative		**66.7%**	**13.3%**	**-0.7% to 28.9%**	**-2.2%**	**-8.3% to 4.2%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	2.9%	-0.2% to 5.9%	-0.41%	-1.6% to 0.8%
2031	$18.28	21.9%	5.8%	-0.3% to 12.2%	-0.83%	-3.1% to 1.5%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Health Industry Effects using Metro Sample (ADRZb)

Table 47q

Changes in Health Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	1.7%	0.4% to 2.9%	0.10%	-0.4% to 0.6%
2018	$10.20	6.3%	1.6%	0.4% to 2.7%	0.09%	-0.4% to 0.5%
2019	$10.80	5.9%	1.5%	0.4% to 2.6%	0.09%	-0.3% to 0.5%
2020	$11.40	5.6%	1.4%	0.3% to 2.4%	0.08%	-0.3% to 0.5%
2021	$12.00	5.3%	1.3%	0.3% to 2.3%	0.08%	-0.3% to 0.5%
Cumulative		**33.3%**	**7.7%**	**1.9% to 13.7%**	**0.4%**	**-1.7% to 2.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	3.0%	0.8% to 5.4%	0.15%	-0.6% to 0.9%
2031	$14.63	21.9%	6.2%	1.5% to 11.1%	0.30%	-1.1% to 1.8%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47 r

Changes in Health Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	3.3%	0.8% to 5.9%	0.20%	-0.8% to 1.2%
2018	$11.40	11.8%	3.0%	0.7% to 5.2%	0.18%	-0.7% to 1.0%
2019	$12.60	10.5%	2.6%	0.7% to 4.6%	0.16%	-0.6% to 0.9%
2020	$13.80	9.5%	2.4%	0.6% to 4.2%	0.14%	-0.5% to 0.8%
2021	$15.00	8.7%	2.2%	0.5% to 3.8%	0.13%	-0.5% to 0.8%
Cumulative		**66.7%**	**14.3%**	**3.4% to 26.0%**	**0.8%**	**-3.0% to 4.8%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Neumark et al. (2014). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis/St Paul MSA

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	3.0%	0.8% to 5.4%	0.15%	-0.6% to 0.9%
2031	$18.28	21.9%	6.2%	1.5% to 11.1%	0.30%	-1.1% to 1.8%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Restaurant Industry Effects using Hennepin/Ramsey County Sample (ADRZ)

Table 47s

Changes in Restaurant Employee Earnings and Employment for Establishing a $12 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	3.4%	2.6% to 4.3%	0.25%	-0.4% to 0.9%
2018	$10.20	6.3%	3.2%	2.5% to 4.0%	0.23%	-0.4% to 0.9%
2019	$10.80	5.9%	3.0%	2.3% to 3.8%	0.22%	-0.4% to 0.8%
2020	$11.40	5.6%	2.9%	2.2% to 3.6%	0.21%	-0.3% to 0.8%
2021	$12.00	5.3%	2.7%	2.1% to 3.4%	0.20%	-0.3% to 0.7%
Cumulative		**33.3%**	**16.2%**	**12.2% to 20.4%**	**1.1%**	**-1.8% to 4.1%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $12 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	6.3%	4.8% to 7.9%	0.37%	-0.6% to 1.4%
2031	$14.63	21.9%	13.1%	9.8% to 16.5%	0.75%	-1.2% to 2.8%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47t

Changes in Restaurant Employee Earnings and Employment for Establishing a $15 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	6.9%	5.2% to 8.5%	0.50%	-0.8% to 1.8%
2018	$11.40	11.8%	6.1%	4.6% to 7.5%	0.44%	-0.7% to 1.6%
2019	$12.60	10.5%	5.4%	4.1% to 6.7%	0.39%	-0.7% to 1.4%
2020	$13.80	9.5%	4.9%	3.7% to 6.1%	0.35%	-0.6% to 1.3%
2021	$15.00	8.7%	4.5%	3.4% to 5.6%	0.32%	-0.5% to 1.2%
Cumulative		**66.7%**	**31.0%**	**23.0% to 39.5%**	**2.0%**	**-3.3% to 7.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $15 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	6.3%	4.8% to 7.9%	0.37%	-0.6% to 1.4%
2031	$18.28	21.9%	13.1%	9.8% to 16.5%	0.75%	-1.2% to 2.8%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Restaurant Industry Effects using Hennepin/Ramsey County Sample (ADRZ)

Table 47u

Changes in Retail Employee Earnings and Employment for Establishing a $12 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	2.9%	2.2% to 3.6%	-0.34%	-0.8% to 0.1%
2018	$10.20	6.3%	2.7%	2.0% to 3.4%	-0.31%	-0.7% to 0.1%
2019	$10.80	5.9%	2.5%	1.9% to 3.2%	-0.30%	-0.7% to 0.1%
2020	$11.40	5.6%	2.4%	1.8% to 3.0%	-0.28%	-0.6% to 0.1%
2021	$12.00	5.3%	2.3%	1.7% to 2.8%	-0.26%	-0.6% to 0.1%
Cumulative		**33.3%**	**13.5%**	**10.0% to 17.0%**	**-1.5%**	**-3.3% to 0.4%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $12 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	5.3%	4.0% to 6.6%	-0.50%	-1.1% to 0.1%
2031	$14.63	21.9%	10.9%	8.1% to 13.7%	-1.00%	-2.2% to 0.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47v

Changes in Retail Employee Earnings and Employment for Establishing a $15 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	5.8%	4.3% to 7.2%	-0.67%	-1.5% to 0.2%
2018	$11.40	11.8%	5.1%	3.8% to 6.4%	-0.59%	-1.3% to 0.1%
2019	$12.60	10.5%	4.5%	3.4% to 5.7%	-0.53%	-1.2% to 0.1%
2020	$13.80	9.5%	4.1%	3.1% to 5.1%	-0.48%	-1.1% to 0.1%
2021	$15.00	8.7%	3.8%	2.8% to 4.7%	-0.44%	-1.0% to 0.1%
Cumulative		**66.7%**	**25.5%**	**18.7% to 32.6%**	**-2.7%**	**-5.9% to 0.7%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $15 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	5.3%	4.0% to 6.6%	-0.50%	-1.1% to 0.1%
2031	$18.28	21.9%	10.9%	8.1% to 13.7%	-1.00%	-2.2% to 0.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Health Industry Effects using Hennepin/Ramsey County Sample (ADRZ)

Table 47w

Changes in Health Employee Earnings and Employment for Establishing a $12 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	4.0%	3.3% to 4.8%	-0.06%	-0.3% to 0.2%
2018	$10.20	6.3%	3.8%	3.1% to 4.5%	-0.05%	-0.3% to 0.2%
2019	$10.80	5.9%	3.6%	2.9% to 4.3%	-0.05%	-0.3% to 0.2%
2020	$11.40	5.6%	3.4%	2.7% to 4.0%	-0.05%	-0.3% to 0.2%
2021	$12.00	5.3%	3.2%	2.6% to 3.8%	-0.05%	-0.3% to 0.2%
Cumulative		**33.3%**	**19.3%**	**15.4% to 23.4%**	**-0.3%**	**-1.5% to 1.0%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $12 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	7.5%	6.0% to 9.0%	-0.09%	-0.5% to 0.3%
2031	$14.63	21.9%	15.6%	12.4% to 18.8%	-0.17%	-1.0% to 0.7%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47x

Changes in Health Employee Earnings and Employment for Establishing a $15 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	8.1%	6.5% to 9.7%	-0.11%	-0.7% to 0.4%
2018	$11.40	11.8%	7.1%	5.8% to 8.5%	-0.10%	-0.6% to 0.4%
2019	$12.60	10.5%	6.4%	5.2% to 7.6%	-0.09%	-0.5% to 0.3%
2020	$13.80	9.5%	5.8%	4.7% to 6.9%	-0.08%	-0.5% to 0.3%
2021	$15.00	8.7%	5.3%	4.3% to 6.3%	-0.07%	-0.4% to 0.3%
Cumulative		**66.7%**	**37.2%**	**29.3% to 45.6%**	**-0.5%**	**-2.7% to 1.8%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Health industry elasticities calculated by model from Allegretto et al. (2015b). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $15 Minimum Wage in Hennepin/Ramsey County

Allegretto et al. (2015b)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	7.5%	6.0% to 9.0%	-0.09%	-0.5% to 0.3%
2031	$18.28	21.9%	15.6%	12.4% to 18.8%	-0.17%	-1.0% to 0.7%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Restaurant Industry Effects using US Sample (NSW)

Table 47y

Changes in Restaurant Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	1.7%	-0.4% to 3.8%	-0.42%	-0.7% to -0.1%
2018	$10.20	6.3%	1.6%	-0.3% to 3.6%	-0.39%	-0.7% to -0.1%
2019	$10.80	5.9%	1.5%	-0.3% to 3.4%	-0.37%	-0.6% to -0.1%
2020	$11.40	5.6%	1.4%	-0.3% to 3.2%	-0.35%	-0.6% to -0.1%
2021	$12.00	5.3%	1.4%	-0.3% to 3.0%	-0.33%	-0.6% to -0.1%
Cumulative		**33.3%**	**7.9%**	**-1.6% to 18.2%**	**-1.9%**	**-3.1% to -0.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by Neumark et al. (2014). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	3.2%	-0.6% to 7.1%	-0.63%	-1.1% to -0.2%
2031	$14.63	21.9%	6.4%	-1.3% to 14.7%	-1.25%	-2.1% to -0.4%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47z

Changes in Restaurant Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	3.5%	-0.7% to 7.6%	-0.84%	-1.4% to -0.3%
2018	$11.40	11.8%	3.1%	-0.6% to 6.7%	-0.74%	-1.2% to -0.2%
2019	$12.60	10.5%	2.7%	-0.6% to 6.0%	-0.66%	-1.1% to -0.2%
2020	$13.80	9.5%	2.5%	-0.5% to 5.5%	-0.60%	-1.0% to -0.2%
2021	$15.00	8.7%	2.3%	-0.5% to 5.0%	-0.55%	-0.9% to -0.2%
Cumulative		**66.7%**	**14.8%**	**-2.9% to 34.9%**	**-3.3%**	**-5.6% to -1.1%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by Neumark et al. (2014). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Restaurant Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	3.2%	-0.6% to 7.1%	-0.63%	-1.1% to -0.2%
2031	$18.28	21.9%	6.4%	-1.3% to 14.7%	-1.25%	-2.1% to -0.4%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Range of Retail Industry Effects using US Sample (NSW)

Table 47aa

Changes in Retail Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	1.7%	-0.4% to 3.8%	-0.28%	-0.5% to -0.1%
2018	$10.20	6.3%	1.6%	-0.3% to 3.6%	-0.26%	-0.5% to -0.1%
2019	$10.80	5.9%	1.5%	-0.3% to 3.4%	-0.25%	-0.4% to -0.1%
2020	$11.40	5.6%	1.4%	-0.3% to 3.2%	-0.23%	-0.4% to 0.0%
2021	$12.00	5.3%	1.4%	-0.3% to 3.0%	-0.22%	-0.4% to 0.0%
Cumulative		**33.3%**	**7.9%**	**-1.6% to 18.2%**	**-1.2%**	**-2.2% to -0.3%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Retail industry elasticities calculated by Neumark et al. (2014). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	3.2%	-0.6% to 7.1%	-0.42%	-0.8% to -0.1%
2031	$14.63	21.9%	6.4%	-1.3% to 14.7%	-0.84%	-1.5% to -0.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47ab

Changes in Retail Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$10.20	13.3%	3.5%	-0.7% to 7.6%	-0.56%	-1.0% to -0.1%
2018	$11.40	11.8%	3.1%	-0.6% to 6.7%	-0.49%	-0.9% to -0.1%
2019	$12.60	10.5%	2.7%	-0.6% to 6.0%	-0.44%	-0.8% to -0.1%
2020	$13.80	9.5%	2.5%	-0.5% to 5.5%	-0.40%	-0.7% to -0.1%
2021	$15.00	8.7%	2.3%	-0.5% to 5.0%	-0.37%	-0.7% to -0.1%
Cumulative		**66.7%**	**14.8%**	**-2.9% to 34.9%**	**-2.2%**	**-4.0% to -0.5%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by Neumark et al. (2014). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Retail Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$15.00					
2026	$16.56	10.4%	3.2%	-0.6% to 7.1%	-0.42%	-0.8% to -0.1%
2031	$18.28	21.9%	6.4%	-1.3% to 14.7%	-0.84%	-1.5% to -0.2%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

95% Confidence Health of Restaurant Industry Effects using US Sample (NSW)

Table 47ac

Changes in Health Employee Earnings and Employment for Establishing a $12 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Annual Change	Annual Change	Confidence Interval	Annual Change	Confidence Interval
2016	$9.00					
2017	$9.60	6.7%	1.7%	-0.4% to 3.8%	-0.04%	-0.3% to 0.2%
2018	$10.20	6.3%	1.6%	-0.3% to 3.6%	-0.04%	-0.3% to 0.2%
2019	$10.80	5.9%	1.5%	-0.3% to 3.4%	-0.04%	-0.2% to 0.2%
2020	$11.40	5.6%	1.4%	-0.3% to 3.2%	-0.03%	-0.2% to 0.2%
2021	$12.00	5.3%	1.4%	-0.3% to 3.0%	-0.03%	-0.2% to 0.2%
Cumulative		**33.3%**	**7.9%**	**-1.6% to 18.2%**	**-0.2%**	**-1.2% to 0.9%**

Note: Schedule on the increase of minimum wage from 9 USD to 12 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by Neumark et al. (2014). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $12 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings		Expected Change in Employment	
Year	Amount	Further Change	Further Change	Confidence Interval	Further Change	Confidence Interval
2021	$12.00					
2026	$13.25	10.4%	3.2%	-0.6% to 7.1%	-0.06%	-0.4% to 0.3%
2031	$14.63	21.9%	6.4%	-1.3% to 14.7%	-0.12%	-0.8% to 0.6%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Table 47ad

Changes in Health Employee Earnings and Employment for Establishing a $15 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings				Expected Change in Employment			
Year	Amount	Annual Change	Annual Change	Confidence Interval			Annual Change	Confidence Interval		
2016	$9.00									
2017	$10.20	13.3%	3.5%	-0.7%	to	7.6%	-0.08%	-0.6%	to	0.4%
2018	$11.40	11.8%	3.1%	-0.6%	to	6.7%	-0.07%	-0.5%	to	0.3%
2019	$12.60	10.5%	2.7%	-0.6%	to	6.0%	-0.06%	-0.4%	to	0.3%
2020	$13.80	9.5%	2.5%	-0.5%	to	5.5%	-0.06%	-0.4%	to	0.3%
2021	$15.00	8.7%	2.3%	-0.5%	to	5.0%	-0.05%	-0.4%	to	0.3%
Cumulative		**66.7%**	**14.8%**	**-2.9%**	**to**	**34.9%**	**-0.3%**	**-2.2%**	**to**	**1.6%**

Note: Schedule on the increase of minimum wage from 9 USD to 15 USD by 2021 estimated by EPI. These estimates take as given the elasticity from tables 38 and 39: Restaurant industry elasticities calculated by Neumark et al. (2014). Similar interpretations on the expected effects on the outcomes can be calculated using other elasticities reported in tables 38 and 39. Confidence Interval uses 95% confidence bounds.

Further Changes in Health Employee Earnings and Employment for Indexing a $15 Minimum Wage in Minneapolis

Neumark et al. (2014)

	Wage		Expected Change in Earnings				Expected Change in Employment			
Year	Amount	Further Change	Further Change	Confidence Interval			Further Change	Confidence Interval		
2021	$15.00									
2026	$16.56	10.4%	3.2%	-0.6%	to	7.1%	-0.06%	-0.4%	to	0.3%
2031	$18.28	21.9%	6.4%	-1.3%	to	14.7%	-0.12%	-0.8%	to	0.6%

Note: Inflation assumed to be 2.4% based on Congressional Budget Office estimates. In addition, authors' original model is designed to one time changes in the minimum wage in a controlled setting. Because indexing the minimum wage each year to inflation can be anticipated, workers may adjust to changes in their wages differently. Model also assumes no additional changes in the minimum wage in surrounding areas. Cumulative changes are compounded annually**, and reflect the cumulative change from 2021 to the year shown.**

Best Practices and Implementation

Policy Design

Many localities offer exemptions, tiers, and special rates for certain constituents. These policies can act to incentivize behavior that promotes workplace stability, or can provide firms that are sensitive to changes in staffing extra leeway to adapt to the policy.

- Currently, Minnesota creates a second tiered minimum wage for employer who make less than $500,000 in sales receipts [Department of Labor, Wage and Hours Division]
    - This cutoff is not indexed to inflation, but the minimum wage rate of Minnesota itself is set to index to inflation by 2018 [See Table 1]
    - This cutoff matches current Federal minimum wage cutoffs
- Minnesota also has a subminimum wage, designed for workers with a disability

  that is lower than the state minimum, under statute 177.28 [Minnesota Department of Labor and Industry (MDLI), David Berry, 2015]

    - The goal of this program is to give employers an incentive to hire workers with a disability that would otherwise impede their ability to work
    - Employers currently require a permit from the MDLI to offer this commensurate wage
    - No employer may hire more than 10% of their workforce under this provision
    - This commensurate wage is currently calculated as a percentage of the wage of a worker with the same responsibilities, but does not have a disability
        - This means that some Minnesota workers able to be paid 50% of the minimum wage

        - Although the current Minnesota minimum wage policy allows for these workers to be paid below $7.75, an increase of the minimum wage would still lead to an increase of the wage of these workers as well because their wage can still only be 50% of the minimum wage, if Minneapolis chose to adopt a minimum wage with similar design
    - There is little recent statistical research on the costs or benefits of commensurate wage policy
- Richmond, CA offers credits for employers who offer health, academic, or child care benefits to their employees. (Schmitt 2013, Dube, Naidu, Reich 2007)
    - If an employer offers health or child care for their employees, the employer is allowed to pay a lower wage rate, to a certain point
- San Francisco designed its minimum wage to take place over different timeframes for profit firms than for nonprofit firms who contract with the city [City of San Francisco, (a)]
    - This allows nonprofits time to renegotiate their grants to fundraise accordingly
- Seattle and San Francisco offer a second tier minimum wage for firms that fall below a certain headcount
    - Seattle's headcount cutoff is at 500 employees [City of Seattle (a)]
    - San Francisco's headcount cutoff is at 10 employees
        - For context, roughly two out of three firms in The Hennepin/Ramsey County area have fewer than 10 employees [Hoover's Dun and Bradstreet]
    - Los Angeles and San Francisco penalize employers who do not comply with minimum wage laws by generating liens on income for the firm in addition to being responsible for back-pay [City of San Francisco, (b)]

- Most localities enforce their minimum wage by making the transparent reporting of wages a condition for their services and contracts
- Almost every locality with a minimum wage ensures a right of action for employees, that employees have the right to file a lawsuit against their if their wages have been withheld
    - It is important to also ensure that there are protections in place to ensure that employees who bring a case against their employer do not fear retaliation in the form of reduced hours, otherwise, employees may not come forward (Weil & Pyles, 2005)
    - In addition, Seattle treats a breach of paying the minimum wage as a misdemeanor offence [City of Seattle (b)]
- Seattle and Berkeley aim to promote compliance of their minimum wage by creating an outreach program that partners with non-governmental organizations as an information campaign to ensure employees and employers are familiar with the law
    - These programs are especially effective at partnering with organizations that have a relationship with employees whose native language is not English
- Local minimum wage tiers must comply with state and federal rates as well

Staffing

Although not specific to this proposed minimum wage policy, localities have allocated resources to investigate breaches in the minimum wage and to act as centralized points of contact for those with questions about the local minimum wage.

- San Francisco allocated $1.4 million to cover the cost of investigators to research potential breaches in the pay (Koonse, Dietz, Bernhardt, 2015)
    - This group also investigates their paid sick leave law
    - San Francisco also has a partnership with the state of California to simplify enforcement
- Los Angeles has a goal of 32,000 low wage workers / investigator (Koonse, Dietz, Bernhardt, 2015)
    - Investigators have the resources to advocate for the worker if they find a breach in labor law, and often serve as a first point of contact for employees to go to in order to identify when the minimum wage law is not being followed
- Chicago and Los Angeles have a commissioner who determines the appropriate level to index changes in the minimum wage (Koonse, Dietz, Bernhardt, 2015)
    - Considerations include
        - General performance of the economy
        - If prices are increasing above a tolerable threshold
        - If prices are pressuring wages to decrease
- The effectiveness of minimum wage enforcers is increased by partnering with other government agencies to respond to worker complaints in a timely manner, to

respond to questions from the public about the design of the law, and to partner with other agencies to form audits of employers (Koonse, Dietz, Bernhardt, 2015)

  - In addition, forming partnerships with non-government organizations allows for further channels of communication between those with questions about the minimum wage and those tasked with ensuring its enforcement

- Minnesota's Department of Labor and Industry issues permits for commensurate wages for workers with a disability. MDLI also maintains records for these permits and requires clear tracking of worker productivity to ensure that wages are proportional to productivity [MDLI]

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IMPACT OF A MINIMUM WAGE INCREASE IN THE CITY OF MINNEAPOLIS ON IMMIGRANT WORKERS

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Introduction

As the research team analyzes the impact of an increase in the minimum wage in a local economy, the research team finds obvious the need to incorporate into the current discussion a subpopulation that has become an important component of the working population potentially affected by minimum wage changes. Immigrant workers have become the largest growing group in low paid jobs in the United States. Overall, immigrant workers have lower earnings than native workers at national and state level. Tables 48 and 49 shows the long-term trends of the share of the low-wage workforce by different groups from 1994 to 2015: teens, low-skilled immigrants, and recent low-skilled immigrants in the nation and Minnesota. The trend for teens has been downward slopping even before the Great Recession but it was intensified during this critical period. Meanwhile, the other groups show a noticeable upward trend in their workforce participation in low-paid jobs. The period during the Great Recession decreased the slope of that trend but not as much as it was for the case of teen workers. Minnesota trend for teens mimics national levels, meanwhile the trend of the share of low-skilled immigrants (and recent low-skilled immigrants) has a steady upward trend. This figure shows evidence of the declining relevance of teens as a share of the low-paid workforce in the US, and incorporates the immigrant workforce in the debate of minimum wage changes and low paid jobs not only in the country but also in the state.

When a change of a minimum wage is analyzed, the literature has an agreement on analyzing the most likely affected group, potentially affected workers, given that, on aggregate and after adjustments, the overall working population would probably be unaffected by a minimum wage increases. For instance, the research team would expect that a highly skilled worker, not paid by the hour, would not directly see a change in salary or employment after an increase in the effective minimum wage. In this case, the minimum wage is not binding. In addition to identifying the potential affected group, the team uses a counterfactual control group that represents the case without an increase of minimum wage. Recent literature has concentrated on this second step and relevant authors have defined methodologies that the research team uses in this report.[1] However, in this current analysis, the first stage, defining the potential affected workers, has been taken as given by concentrating the discussion either on teenagers and/or on the Restaurant and Food Service industry. In this section of the report, we consider the overall immigrant population motivated by the stylized fact of the tendency of immigrant workers having lower earnings than their native counterparts and the long-term upward sloping trend in the share of this population in low-paid jobs. However, the research team digs deeper into this particular group and consider different representations of immigrant groups that would provide us with a better picture of this impact, and, simultaneously, would provide us with the estimated elasticity that the research team later uses to estimate the final estimated impact of an increase of the minimum age in the City of Minneapolis.

[1] Technical notes in this report concentrate on the recent methodologies used to estimate the effect of a minimum wage increase on the economy and labor.

Elasticity estimations on the impact of minimum wage increases on immigrant workers.

For our analysis of an increase in the minimum wage and its impact on the immigrant population, the research team considers different sets of groups and models that consider the relevance of each particular group, state and time specific trends. With this, the research team incorporates what has been recently discussed literature on the methodology used to estimate a minimum wage change in the economy. The research team then considers three different methodologies to estimate the impact of a minimum wage increase on immigrants. These models are estimated for each sub-group. Model (1) is the two-way fixed effect model w/o state or division trend. Model (2) is two-way fixed effect with state trends, that incorporates Neumark et. al. (2014) and ADR (2011) methodological discussion. Model (3) is Two-way Fixed Effect with state and division trends (this includes the latest publication ADRZ (2015) and the relevance of spatial heterogeneity in the estimation of this impact).[2] For the analysis, the research team follows literature in the public domain and uses a nationally representative sample of CPS Outgoing Rotation Group January 1994 to December 2014, and estimate quarter estimated unemployment rates for all monthly variables and states.[3]

Table 50 shows the results of several different regressions combining the 3 different methodologies and 13 subgroups of immigrant workers. Among these 13 groups, the research team would expect that those with lower human capital and/or tenure and experience in the country would be considered as the most affected groups. Regarding earnings, the impact of an increase in the minimum wage would imply an increase of earnings for all groups. However, when the

[2] See technical notes for details.
[3] Information that identifies individual's place of birth is only provided since 1994, a variable that defines whether the person is foreign-born. This definition characterizes who is immigrant and who is native in the sample. Foreign-born and immigrant are use as synonymous in this report.

research team looks at Table 50 the significance of this effect varies by methodology. Including division trends, along with state-fixed and time-fixed effects, and state-specific trends, yields a positive but statistically insignificant effect on wages from an increase of a minimum wage on wage. As expected, focusing only on significant values, the groups that see their earnings increased the most are recent low-skilled immigrants, Hispanics, non-citizens, and non-Hispanic non-white workers. For recent low-skilled immigrants, a 10% increase of a minimum wage would represent an almost 2% increase of their earnings. This effect is only consistent to the inclusion of state-specific trends. If Census division trends are considered, the effect is much smaller (0.13%) and not significant.[4]

When the research team evaluates each separate and relevant industry for all immigrants, Retail and Other Industries maintain their significances when state-specific trends are included. A 10% increase in the minimum wage increases immigrant workers' salaries by 10% and 1.9% in these industries. Across all different methodologies, the research team does not find a significant effect by increasing the minimum wage in the Healthcare industry.

Looking at the effects of a minimum wage increase on employment, the research team consistently finds non-significant effect across almost all groups, and especially for those groups that the research team would consider likely to be affected. Using the methodologies discussed in the literature, when the effect is significant, the research team finds a positive effect on

[4] There could be several reasons behind finding no significance on the effect of an increase in the minimum wage on earnings for immigrant groups. First, recent immigrants are more likely to be undocumented and get paid a wage already below the minimum wage, their earnings could not be affected by changes in the wages in the formal market, especially when the research team compares within census divisions. Furthermore, recent immigrants may be more mobile within a census division so that an increase on the minimum wage may also increase the number of immigrants competing for a job. Second, there exist the possibility of having a sample that it is too small to allow us to identify the effect using the saturated model. The model includes nine census division per period, but the variation on groups as recent low-skilled immigrants would need to be large and different enough within and across divisions that the research team can disentangle the effect of an increase in the minimum wage to other changes over time in these economies.

employment for Citizens and non-Hispanic white immigrant workers. The positive effect on non-Hispanic white immigrant workers proves to be robust for all model specifications. A 10% increase in the minimum wage would represent an increase in employment participation of non-Hispanic white immigrants of around 0.5-0.76 basis points. If the minimum wage increases by 20%, employment increases by 1 non-Hispanic white worker. The final elasticity is estimated by dividing the estimated effect by the relevant employment-to-population ratio. With an employment rate of 85% non-Hispanic white immigrants, on average, would have an estimated elasticity of 0.07, which means a 10% increase in the minimum wage would increase employment for this group by 0.7% percent.

By sector, the effect of minimum wage varies. Only the Healthcare industry shows a consistent estimation to two model specifications, and the effect is positive. A 10% increase traduces an increase of 0.4 immigrant employees in this sector. However, the effect becomes statistically insignificant when division trends are included (model 3), suggesting that the previous significant effect probably included some trends in this sector that correlate to division-specific trends. Overall, according to the consistency in the results, the impact on employment is not much different from zero, except when it is positive for the group of Non-Hispanic white immigrant workers; the impact on wages is positive, although it may incorporate some trends already specific to the region.

Simulation and final effect

This section evaluates the final effect of an increase in the minimum wage on immigrant workers in the state considered in our report. Tables 51 and Table 52 show the initial values used to simulate the final effect of an increase in the minimum wage for the city of Minneapolis. The evaluated increments are from $9 to $12 and from $9 to $15. The research team uses EPI initial population

and average income values estimated where no minimum wage increase is assumed. Then, the research team estimated elasticities and semi elasticities from Table 50, to incorporate the final impact across all changes and all years.

The analysis assumes a 5-years period constant incremental application of the increase in the minimum wage. To avoid confusion, the research team only simulates effects where the research team identifies a statistically significant effect in our analysis in Table 50. The research team identifies non-significant values with the letters 'ns' in the tables. Table 53 and Table 54 show the final accumulated effect of an increase of a minimum wage, $9 to $12 and $9 to $15, respectively, during 5 years for the city of Minneapolis.

Table 53 and Table 54, show the effect on average income for the most affected groups of immigrant workers who recently arrived and did not finish high school, Hispanic workers, and Non-Hispanic non-white workers. The maximum amount of expected increase on average income for these groups is $932 for a change to $12 per hour and $2,025 for a change to $15 per hour minimum wage (Hispanic immigrant workers). As the research team explained previously, the effect of an increase in the minimum wage on immigrants' wages is not discernably different from zero, when considering the saturated model of all possible geographic spatial heterogeneity for the national estimates. There are several reasons for this finding. On the one hand, the sample of observations is not large enough to identify the effect when Census division controls and their trends are incorporated into the model. On the other hand, variation between immigrants in different states could be very low within Census division. The trend of the immigrant wage profiles among states that conform to each Census division could follow a similar pattern. There is also an alternative explanation to finding zero effect on immigrant workers earnings. When evaluating this population, the research team needs to keep in mind a portion of the population could be

undocumented. Although population and employment distributions are easier to estimate, earnings of this group are generally either unknown or difficult to capture on national surveys. If payments have been done 'under the table' in an informal market, the research team cannot capture the effect of a minimum wage increase in the formal market. Also, the impact may happen in the informal market, but it may take longer to be implemented. Employers are competing for low-skilled labor, if teenagers lean towards more formal jobs with higher wages after the increase in the minimum wage, low-skilled immigrants would face a lower competition in these markets, which may still indirectly push the price of labor up, increasing wages also in the informal market.

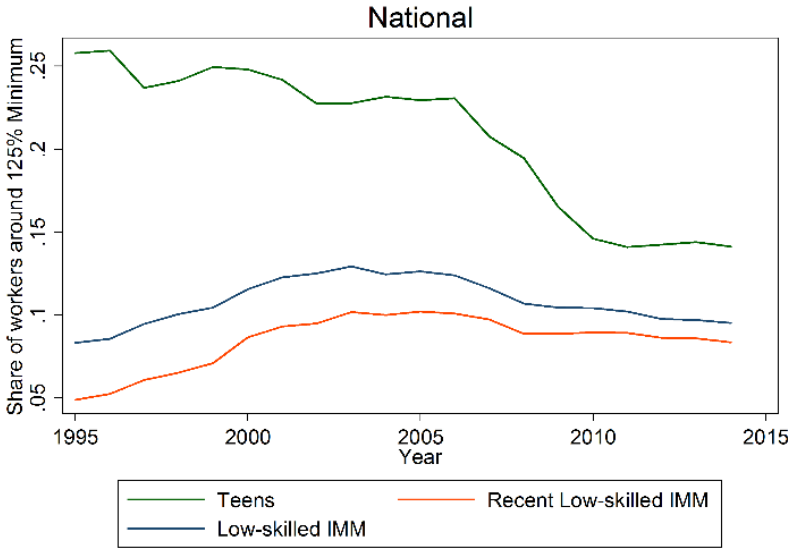
Unlike the effects of a higher minimum wage on the market as a whole, the immigrant working population, is not most affected by the restaurants or eating and drinking sectors. Unlike for teenagers or for the average low-skilled adult worker, immigrants are most affected in the Retail and Other Industries.[5]

[5] The research team focused on these specific ways of categorizing industries because, according to estimates on the whole population, these industries are most largely affected by an increase in the minimum wage in the state of Minnesota.

Figures and Tables

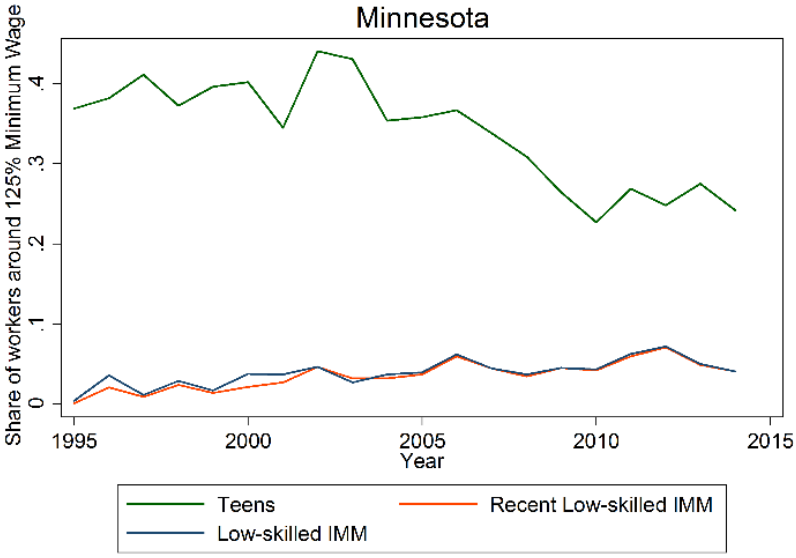
National trend on the share of teens and immigrants of low-wage workforce.

Table 48 – National Trends in Teen and Immigrant Labor Force



Minnesota trend on the share of teens and immigrants of low-wage workforce.

Table 49 –State Trends in Teen and Immigrant Labor Force



Note: Author's own estimations using CPS outgoing rotation from 1994 to 2015. Teens are classified as individuals 16-19 years old. Low-skilled immigrants, foreign born, who are High School Dropout, and low-skilled immigrants, who have arrived less than 10 years prior to the year of analysis, also are part of this group. Low-paid jobs are considered those held by individuals with salaries below or above (around 125%) the minimum wage for each particular period and state. Each point represents a weighted estimated proportion for each particular group.

Estimated Elasticities on the impact of minimum wage on employment and wages of immigrant workers.

Table 50 – Simulated Impacts of Minimum Wage on Immigrant Workers

	Natural Log of Wage			Employment		
Groups	(1)	(2)	(3)	(1)	(2)	(3)
All immigrants	**0.155*** **	**0.140*** **	0.0492	0.0215	0.0168	0.0213
	(0.0372)	*(0.0319)*	*(0.0404)*	*(0.0159)*	*(0.0142)*	*(0.0303)*
Low-Skilled	**0.180*** **	**0.168*** **	0.00849	0.0123	-0.0019	-0.00194
	(0.0604)	*(0.0539)*	*(0.0543)*	*(0.0222)*	*(0.0190)*	*(0.0428)*
Recent low-skilled	**0.211*** **	**0.195*** **	0.0129	-0.00276	-0.0079	-0.0175
	(0.0628)	*(0.0566)*	*(0.0640)*	*(0.0177)*	*(0.0175)*	*(0.0396)*
Non-Citizen	**0.164*** **	**0.174*** **	0.0239	0.0152	0.0245	-0.00058
	(0.0449)	*(0.0541)*	*(0.0437)*	*(0.0192)*	*(0.0200)*	*(0.0353)*
Citizen	**0.0771* **	**0.0934** **	0.0389	-0.0102	-0.0057	**0.0494* **
	(0.0419)	*(0.0384)*	*(0.0672)*	*(0.0183)*	*(0.0179)*	*(0.0280)*
Hispanic	**0.216*** **	**0.194*** **	-0.0128	0.0161	0.0164	-0.00253
	(0.0599)	*(0.0573)*	*(0.0542)*	*(0.0177)*	*(0.0168)*	*(0.0462)*
Non-Hispanic	**0.129*** **	**0.114*** **	0.0643	**0.0323* **	0.0252	0.0206
	(0.0307)	*(0.0284)*	*(0.0550)*	*(0.0189)*	*(0.0157)*	*(0.0297)*
Non-Hispanic White	**0.146*** **	**0.135*** **	0.0441	**0.0509* **	**0.0520* **	**0.0762* **
	(0.0360)	*(0.0366)*	*(0.0615)*	*(0.0272)*	*(0.0264)*	*(0.0443)*
Non-Hispanic Non White	**0.186*** **	**0.155*** **	0.0589	0.0195	0.0136	-0.00672
	(0.0480)	*(0.0401)*	*(0.0508)*	*(0.0165)*	*(0.0153)*	*(0.0296)*
Industry (all immigrants)						
Retail	**0.154*** **	**0.0990** **	0.0161	0.0231	-0.0208	0.00608
	(0.0372)	*(0.0426)*	*(0.0377)*	*(0.0181)*	*(0.0472)*	*(0.0544)*
Healthcare	0.123	0.102	0.0113	**0.0285* **	**0.0415* **	0.0384
	(0.0775)	*(0.0949)*	*(0.102)*	*(0.0158)*	*(0.0209)*	*(0.0262)*
Eating and Drinking	**0.118** **	-0.00677	0.0187	**0.0614** **	0.0840	0.0666
	(0.0494)	*(0.0644)*	*(0.0855)*	*(0.0239)*	*(0.0578)*	*(0.0613)*
Other Industries	**0.230*** **	**0.194* **	0.103	0.00722	0.0148	0.0192
	(0.0712)	*(0.111)*	*(0.109)*	*(0.0152)*	*(0.0344)*	*(0.0392)*
Sate and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
State Trend	No	Yes	Yes	No	Yes	Yes
Division Trend	No	No	Yes	No	No	Yes

Notes: *** p<0.01, ** p<0.05, * p<0.1. Bolded estimated values that are statistically significant. The table shows estimated coefficients on the natural log of minimum wage from OLS regressions that include fixed effects controls. The dependent variable is individual's natural log of wage. Each coefficient is from a separate regression. For each group, a different model was specified. Model (1) is the Two-way Fixed Effect model w/o state or division trend. Model (2) is Two-way Fixed effect with State Trends. Model (3) is Two-way Fixed Effect with State and Division Trends. Regressions are on adults aged 20-55 years old. Immigrant is defined as someone born abroad from the US and its territories. Less-skilled workers are identified as individuals who do not have a high school diploma. Recent immigrants are defined as those arrived 10 years or less prior to the year of the survey. Other variables included unemployment, marriage status, age, gender, and Hispanic dummy. Period of analysis: 1994-2015, using CPS-ORG, weighted using the outgoing rotation weights. Robust, clustered standard errors are in parentheses. The lowest sample size is 37,686 observations.

Simulated Effects Initial Values (from $9 to $12) – City of Minneapolis

Table 51

Simulated increases:	Nominal increase	Percentage change	Naturalized workers	Non-Citizen workers	Naturalized Average wage	Non-Citizen average wage
January 1, 2017 - $9.60	$0.60	6.43%	4000	6000	$13,404	$15,159
January 1, 2018 - $10.20	$0.60	5.89%	4000	6000	$13,810	$15,479
January 1, 2019 - $10.80	$0.60	5.41%	5000	6000	$15,776	$16,281
January 1, 2020 - $11.40	$0.60	4.99%	5000	7000	$16,889	$17,063
January 1, 2021 - $12.00	$0.60	4.62%	5000	8000	$17,621	$17,877

Note: The estimated values are discussed earlier in our report. Population and earnings are estimations assuming no minimum wage increase. These are considered the baseline values. Simulations and population distribution for the city of Minneapolis

Simulated Effects Initial Values (from $9 to $15) – City of Minneapolis

Table 52

Simulated increases:	Nominal increase	Percentage change	Naturalized workers	Non-Citizen workers	Naturalized Average wage	Non-Citizen average wage
January 1, 2017 - $9.60	$1.20	13.33%	4000	6000	$14,639	$15,045
January 1, 2018 - $10.20	$1.20	11.76%	5000	7000	$16,257	$16,108
January 1, 2019 - $10.80	$1.20	10.53%	6000	8000	$17,746	$17,856
January 1, 2020 - $11.40	$1.20	9.52%	7000	9000	$18,825	$19,405
January 1, 2021 - $12.00	$1.20	8.70%	7000	11000	$20,381	$20,923

Note: The estimated values are discussed earlier in our report. Population and earnings are estimations assuming no minimum wage increase. Interactions between estimated share of potentially affected workers by sector and groups were used to estimate potential changes in employment and wages. These are considered the baseline values. Simulations and population distribution for the city of Minneapolis.

Total Simulated Effects ($9 to $12) – City of Minneapolis

Table 53 – Simulated Impacts of Minimum Wage on Immigrant Workers ($12)

	Wage				Employment			
Groups	(1)	(2)	(3)	**Overall**	(1)	(2)	(3)	**Overall**
All immigrants	$608	$220	ns	**0-$608**	Ns	ns	ns	**ns**
Low-Skilled immigrants	$777	$725	ns	**0-$777**	Ns	ns	ns	**ns**
Recent low-skilled Immigrants	$910	$841	ns	**0-$910**	Ns	ns	ns	**ns**
Non-Citizen	$708	$751	ns	**0-$751**	Ns	ns	ns	**ns**
Citizen	$333	$403	ns	**0-$403**	Ns	ns	61	**0-61**
Hispanic	$932	$837	ns	**0-$932**	Ns	ns	ns	**ns**
Non-Hispanic	$513	$535	ns	**0-$535**	Ns	ns	ns	**ns**
Non-Hispanic White	$630	$583	ns	**0-$630**	63	65	95	**63-95**
Non-Hispanic Non-White	$803	$669	ns	**0-$809**	Ns	ns	ns	**ns**
Industry (all immigrants)								
Retail	$523	$336	ns	**0-$523**	Ns	ns	ns	**ns**
Healthcare	ns	ns	ns	**Ns**	20	14	ns	**0-20**
Eating and Drinking	$470	ns	ns		94	ns	ns	**0-94**
Other Industries	$1,002	$837	ns	**0-$1,002**	Ns	ns	ns	**ns**
State and Time FE (Two Way FE)	Yes	Yes	Yes		Yes	Yes	Yes	
State Trend	No	Yes	Yes		No	Yes	Yes	
Division Trend	No	No	Yes		No	No	Yes	

Note: The estimated value is specific to the change in minimum wage of $3, a change of minimum wage from $9 to $12 during 5 years. Each year the research team assumes a constant increment of $0.60 and computes the estimate on that particular year given the demographic trends estimated by our group. The values shown in the columns overall summarize the impact analysis over all 5 years. 'ns' stands for non-significance minimum wage effect. No statistically significance means the research team cannot reject the hypothesis that the effect of an increase of the minimum wage on the labor outcome we evaluate is zero. Therefore, the potential estimated effect could be from zero to the statistically significant effect the research team estimated.

Total Simulated Effects ($9 to $15) – City of Minneapolis

Table 54 – Simulated Impacts of Minimum Wage on Immigrant Workers ($15)

	Wage				Employment			
Groups	(1)	(2)	(3)	**Overall**	(1)	(2)	(3)	**Overall**
All immigrants	$1,462	$1,327	ns	**0-$1,462**	ns	ns	ns	**ns**
Low-Skilled immigrants	$1,687	$1,575	ns	**0-$1,575**	ns	ns	ns	**ns**
Recent low-skilled Immigrants	$1,978	$1,828	ns	**0-$1,828**	ns	ns	ns	**ns**
Non-Citizen	$1,537	$1,631	ns	**0-$1,631**	ns	ns	ns	**ns**
Citizen	$723	$875	ns	**0-$875**	ns	ns	150	**0-61**
Hispanic	$2,025	$1,818	ns	**0-$1,818**	ns	ns	ns	**ns**
Non-Hispanic	$1,115	$1,162	ns	**0-$1,115**	ns	ns	ns	**ns**
Non-Hispanic White	$1,368	$1,265	ns	**0-$1,368**	154	157	231	**154-231**
Non-Hispanic Non-White	$1,743	$1,453	ns	**0-$1,453**	ns	ns	ns	**ns**
Industry (all immigrants)								
Retail	$637	$409	ns	**0-$637**	ns	ns	ns	**ns**
Healthcare	ns	ns	ns		49	33	ns	**0-49**
Eating and Drinking	$492	ns	ns	**0-$492**	226	ns	ns	**0- 94**
Other Industries	$1,190	$927	ns	**0-$1,190**	ns	ns	ns	**ns**
State and Time FE (Two Way FE)	Yes	Yes	Yes		Yes	Yes	Yes	
State Trend	No	Yes	Yes		No	Yes	Yes	
Division Trend	No	No	Yes		No	No	Yes	

Note: The estimated value is specific to the change in minimum wage of $3, a change of minimum wage from 9 dollars to 12 dollars during 5 years. Each year we assume a constant increment of $0.60 and compute the estimate on that particular year given the demographic trends estimated by our group. The values shown in the columns overall summarize the impact analysis over all 5 years. 'ns' stands for non-significance minimum wage effect. No statistically significance means we cannot reject the hypothesis that the effect of an increase of the minimum wage on the labor outcome we evaluate is zero. Therefore, the potential estimated effect could be from zero to the statistically significant effect we estimated.

FOOD SECURITY

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Interim Report: Minimum Wages and Food Security

This report draws heavily on the national results forthcoming in "Food Security and the Minimum Wage," The Century Foundation.

Introduction

Although the 9.6 percent food insecurity rate for the Minneapolis metropolitan area is less than the 14.2 percent U.S. insecurity rate, nonwhite households in the metropolitan area have an insecurity rate that exceeds their national peers. It equals 22.8 percent compared to the national nonwhite incidence rate of 20.8 percent. The metropolitan area's single parent insecurity rate matches the single parent national value. Both are approximately 28.0 percent.

This report estimates the impact that raising the City of Minneapolis' minimum wage would have on the Metropolitan area's food expenditures, food insecurity, and on the use of social safety nets (e.g., SNAP). To construct the estimates, the report simulates the effects of increasing the minimum wage from its current level of $9.00 per hour by $1.00 per year, until it reaches $15.00 per hour. The proposed increase is similar to Congressman Norcross' proposal that extends Congressman Bobby Scott and Washington State Senator Patty Murray's proposal to increase the federal minimum wage to $12.00 per hour by 2020.

Using a Regression Discontinuity model (exploiting significant variation between state and federal minimum wages), this report seeks to answer the following questions. What will the impact of an increase in the Minneapolis Metropolitan Area's minimum wage from $9.00 to $12.00 and $15.00 per hour? However, to answer this question, this report first estimates at the national level, the impact of an increase in the federal minimum wage from $7.25 to $15.00 per hour. Obtaining national level estimates is important due to data and sample limitations at the metropolitan area and even state level, the report must use parameters and elasticities from the national model to derive the state and metropolitan effects.

The report's key national findings are:

- An increase in the minimum wage significantly raises food expenditures
- An increase in the minimum wage lowers food insecurity, with larger increases for nonwhite, high school graduate, and single-parent households
- The improvement in food security is more the result of lifting up households that face intermittent but significant food insecurity (known as *low food security*), than of raising those up who face consistent and severe deprivation (known as *very low food security*)
    - In other words, raising the minimum wage is a policy that can make a major impact on hunger among families who are not jobless, but who still face too large of a budgetary squeeze to afford enough food, each and every week
- An increase in the minimum wage enables households to worry less about meeting their food needs, to maintain a supply of food, to reduce their reliance on low-cost food, and to afford more-balanced meals
- Because adults are more likely to make sacrifices to their food intake and dietary choices in order to provide for their children, raising the minimum wage has a greater impact on food insecurity among adults than among their children
- Increasing the federal minimum wage to $15.00 per hour by 2023 would make a major impact on food insecurity across the nation
    - Almost 1.1 million households would achieve food security.[1]
        - This statistic represents a 6.7 percent decline in food insecurity
    - Almost 670,000 African American and Latino households would see their food security improve, corresponding to a 6.1 to 15.0 percent reduction in nonwhite insecurity

    - These minority households comprise 44 percent of the 1.2 million households, yet African American and Latino households comprise only 25 percent of all U.S. households
- Almost one-quarter (349,000) of the affected households are single-parent households
    - This statistic corresponds to a 7.1 percent reduction in single mother household insecurity and 14.1 percent reduction for households headed by fathers
    - Single-parent households are 11 percent of all households
- Most households that receive boost reside in urban areas
    - Approximately 1.0 million urban households would experience an increase in their food security, a 6.9 percent reduction in insecurity
- From a regional standpoint, the largest number of beneficiaries would be in the South, where approximately, 430,000 households would become food secure
    - They constitute 37 percent of the 1.2 million households that would achieve food security, quite similar to their 38 percent of all households
- Households that are above 185 percent of the poverty line would have the largest number of households that become food secure under the plan
    - A total of 652,000 households that are above 185 percent of the poverty line would benefit from the series of increases
    - They comprise 56 percent of the beneficiaries, four percentage points higher than their share of all households

The Minneapolis Metropolitan Area Findings

Increasing the Minneapolis area's minimum wage to $15.00 per hour would have on the following impact on the area's families:

- Approximately 17,000 Metropolitan Area households will become food secure, leading to a 6.9 percent drop in food insecurity
    - 3,000 of the drop would be among nonwhite households, representing a 4.9 percent drop in insecurity
    - 4,000 less educated households would experience an improvement in their food security status
    - These data translate into a 3.8 percent reduction in food insecurity
    - Although only 2,000 single parent households would become food secure, they account for a 5.8 percent drop in food security for this vulnerable group
- The increase in the minimum wage to $15.00 per hour will not lead to a major decline in SNAP, WIC and Free/Reduced Lunch Program participation
    - Approximately 600 Hennepin County families of almost 42,000 participating families with children that are currently utilizing the program would lose program eligibility.
    - Only around 30 women with children would see an end to their WIC benefits
- Yet, on the other hand, the increase to $15.00 per hour will have a significant positive impact on local food expenditures
    - The odds of spending money at grocery stores will jump by almost 28 percent, while a 10.0 percent drop in fast food expenditures will occur

- Usual food expenditures will rise on average by $26.00 per week. Average weekly grocery expenditures will jump by around $17.00
    - Usual food expenditures are defined as an estimate from the household of their typical food expenditures, whereas average weekly grocery expenditures relate to specifically grocery expenditures
- Average weekly fast food expenditures will fall by approximately $7.30

The increase in the minimum wage at the local level will raise food expenditures. This increase will improve household food security while at the same time acting as a stimulus to the local macroeconomic economy.

Background: The Definition of Food Security

The U.S. Department of Agriculture (USDA) defines a household's food security status as a continuum that moves from insecurity to security.[2] USDA uses the Current Population Survey's Food Security supplement to estimate where a household is located on the continuum. Households are identified as insecure or secure, based on responses to eighteen questions that explicitly ask each household to report only those behaviors that result from financial resource constraints. Based on the recommendations of a National Academy of Sciences study panel, households in the 2000 to 2014 surveys are classified as "very low" food security, "low" food security, or "food secure."

Food secure households are able to meet their nutritional needs on a regular basis. They only sometimes (or never) have problems or anxiety about consistently accessing adequate food. Their food intake's quality, variety, and quantity are not significantly compromised. Low food security households have reduced the quality, variety, and desirability of their diets, yet the quantity of food intake and normal eating patterns were not substantially disrupted. V**ery low food security households have,** at times during the year, seen the eating patterns of one or more

household members disrupted and food intake reduced because the household lacked money and other resources for food.

To be placed in one of these three categories, households are asked a series of questions about their behaviors and experiences associated with the difficulty in meeting their food needs. The questions cover a wide spectrum of severity of food insecurity. An example of a question that captures the least severe experience includes asking whether the following statements were often, sometimes or never true:

"We worried whether our food would run out before we got money to buy more."

"We couldn't afford to eat balanced meals."

A midrange severity question is:

"In the last twelve months, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?"

Two examples of questions that capture the most severe challenges are:

"In the last twelve months, did you ever not eat for a whole day because there wasn't enough money for food?", or

"In the last twelve months, did any of the children ever not eat for a whole day because there wasn't enough money for food?"

All questions ask households to answer the question based on their experiences over the last twelve months. A key feature of each question is that it asks households to confirm that a lack of resources is the reason for the behavior or experience. Income from work is a prime example of a resource. This focus on financial resources adds further legitimacy for exploring the link between minimum wage policy and food insecurity.

A household is designated as “food insecure” if they report three or more conditions that indicates food insecurity. Specifically, this means that during the previous twelve months, they were unable to acquire adequate food for one or more household members because they had insufficient money and other resources for food. Households are also classified as food insecure if they report any combination of three or more conditions, including any more severe conditions.

The three least severe conditions that would result in a household being classified as food insecure are:

- They worried whether their food would run out before they got money to buy more.
- The food they bought didn’t last, and they didn’t have money to get more.
- They couldn’t afford to eat balanced meals.

A household is categorized as having very low food security to the extent that eating patterns of one or more household members were disrupted and their food intake reduced, at least some time during the year, because they could not afford enough food. To be classified as having very low food security, households with no children present must report at least the three conditions listed above, and also that:

- Adults ate less than they felt they should, and
- Adults cut the size of meals or skipped meals and did so in three or more months.

Under this designation, many households will report additional, more severe experiences and behaviors as well. If there are children in the household, their experiences and behaviors are also assessed. In households with children, an additional two “yes” responses are needed for a designation of very low food security.

Methodology

This section first describes the econometric specifications and data used in the report.

Allegretto, Dube, and Reich (2011) estimate a minimum wage specification that takes into account heterogeneous employment patterns that are correlated with selectivity among states with minimum wages. To account for these factors, the specification controls for long-term growth differences among states and for heterogeneous economic shocks.

However, there exists a debate about its validity. Neumark and Wascher (2014) argue that Allegretto, Dube and Reich's specification is over specified. It removes potentially useful variation that identifies the minimum wage's impact. At issue, is whether division-specific time effects and state-specific linear trends should be included in the model?

Because of this unresolved conflict, this report presents an alternate approach, the regression discontinuity (RD) approach to identifying the impact of a minimum wage increase on food security. The RD approach has become a popular way to achieve identification in a wide variety of social policy evaluation questions.[3] I compare estimates from the RD approach to what I call the baseline or "preferred" model in the literature.

Formally, the baseline model is written as:

(1) $$y_{ist} = \beta_1 \log(MW_{st}) + \beta_2^{'} X_{ist} + \gamma_t + \lambda_s + \varepsilon_{ist},$$

where the term y_{ist} denotes the outcome for the *ith* householder that resides in state '*s*' at time '*t*.' The term $log(MW_{st})$ denotes the ratio of the state and federal minimum wage in year *t* for the *ith* householder. The vector X_{ist} captures demographic information about the individual and their household (gender, race, ethnicity, age, educational attainment, household structure, number of people in the household, urban residence, and the state unemployment rate). The terms λ_s and γ_t denote state and year fixed effects.[4] Allegretto, Dube and Reich (2011) add division-specific time

effects and state-specific linear trend. Neumark and Wascher (2014) argue that this approach removes a large amount of useful information for identifying the minimum wage's impact.

Why does the Regression Discontinuity approach to identifying the impact of an increase in the minimum wage provide a suitable alternate estimator? The "preferred" model in the literature, Equation (1) mixes the impact of how far the higher state minimum wage is from the federal with a state where the minimum wage exceeds the federal minimum wage. Basically, the "preferred" model excludes a dummy variable that captures whether a state's minimum wage exceeds the federal minimum wage. The RD framework contains two minimum wage variables: this dummy variable and a variable that captures the actual difference between the state and federal minimum wage.

However, in the RD framework, the variable of interest is the dummy variable that captures whether the respondent lives in a state where the state minimum wage exceeds the federal, while the difference variable addresses a potential omitted variable bias: the correlation between the dummy variable and the difference between the federal and state minimum wage, and the impact that difference has on the outcome.

The other key distinction between the two models can be the sample. The RD non-parametric framework limits the sample to households in states where the federal minimum wage is the binding wage floor and households where the state minimum wage exceeds the federal but is "near" the federal minimum wage. The RD parametric framework's sample utilizes the full sample of states. Higher order terms in the difference variable control for how far a state's minimum wage is from the federal minimum wage.

Utilizing the exposition in Jacob, et. al. (2012), the basic RD parametric estimator can be written as follows:

(2) $$y_{ist} = \gamma_1 D_{st} + \gamma_2 X_{ist} + f(r_{st}) + v_{ist},$$

where y_{ist} denotes the outcome for the *ith* householder in state *s* at year *t*, γ_1 denotes the average value of the outcome for those in the treatment group after controlling for the state's minimum wage, D_{st} denotes the minimum wage treatment dummy variable that equals 1 if the householder resides in a state (*s*), where the state minimum wage exceeds the federal minimum wage in year *t*, and 0 if the householder lives in a state where in year *t* the federal minimum wage is the law. The variable r_{st} denotes the minimum wage "rating" or distance variable for state *s* at year *t*. It captures in dollar terms how far an individual's state minimum wage is from the federal minimum wage. I center the variable at the cut-point, which means that its minimum value equals zero. Equation (2) is written as a nonlinear function $f(r_i)$, which allows for the inclusion of higher order terms.

When estimated, the coefficient, γ_1 captures the marginal impact of the minimum wage at the cut-point (e.g., federal and state minimum wage equal or federal minimum wage is the binding wage). The "rating" variable accounts for selection bias because the characteristics of minimum wage workers in "high" minimum wage states may be better (e.g., higher levels of educational attainment) than the characteristics of minimum wage workers in states where the minimum wage just exceeds the federal minimum wage. The analysis centers the minimum wage "rating" variable on the cut-point by creating a new variable r_{st}cut-score= (r_{st} — cut-score). This centered variable is used in all of the regressions.

Centering the rating variable makes it easier to interpret the results. The regression's intercept is now located at the cut-point (where the state and federal minimum wages equal) because the value of the rating at the cut-point equals zero, meaning that any shift at the cut-point can be interpreted as a shift in the intercept. To improve precision and control for observable

differences in characteristics, the same covariates as in the "preferred" model are added to the model (X_{ist}).

The function $f(r_i)$ represents the relationship between the minimum wage "rating variable" and the outcome, such as food security. I estimate linear, quadratic, cubic, and quartic models in the minimum wage rating variable. Models that have valid observations below the cutoff will add interactions with the treatment dummy variable. Doing so allows for the slopes to be different above and below the cut off. However, since all of the states with no minimum wage fall under the federal law, there is no left tail and thus the interactions drop out of the model.

Data

The Current Population Survey is a monthly survey of about 60,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics. The CPS is the primary source of information on the U.S. labor force. Respondents are interviewed to obtain information about the employment status, earnings, and hours of work for each household member aged 15 years and older. Along with this information that is collected each month, several supplements are administered throughout the year.

I utilize the CPS Food Security supplements from 1995 to 2014. The supplement was first collected in April 1995 by the U.S. Census Bureau and sponsored by the U.S. Department of Agriculture. Subsequent supplements have been administered in September 1996, April 1997, August 1998, April 1999, and September 2000. For the 2001 to 2014 supplements, the survey was administered in December. Using a respondent's state resident indicator, I link information on a state's minimum wage to each respondent's record. Respondents differ from year to year, but the pooling across years creates a state panel of their minimum wage policy. The major sample restrictions are that each respondent must have complete information on the age, sex, race,

ethnicity, and educational attainment, as well as information on the respondent's household structure, number of household members, and residency in metropolitan statistical areas.[5]

Results

National Evidence:

This report combines data from the CPS Food Supplement with data on state minimum wages to investigate the impact of minimum wage increases on food security. Pooling the micro-data files from 1995 to 2014, this report models the impact of previous increases in the minimum wage on food insecurity, and uses those models to estimate what future increases in the minimum wage might bring, using an increasingly popular statistical framework called Regression Discontinuity (which can isolate the impact of small increases in the minimum wage on people with similar characteristics). Instead of using geographic boundaries, this report compares workers in states where the federal minimum wage is binding, to workers in states with minimum wages that are "close" or "near" the current federal minimum wage—thus ruling out the possibility that it is measuring the impacts of other factors (such as the cost of living) on food security.

Over the study period from 1996 to 2014, annually on average 18 states have minimum wages that exceed the federal, from a low of 7 in 1998 and 1999 to a high of 33 in 2008. Minnesota is one of the states that currently have a minimum wage that exceeds the Federal Minimum wage of $7.25 per hour. The state's current minimum wage is $9.00 per hour. In August 2015, the minimum wage for large employers was raised to $9.00 per hour, with the small-employer minimum wage increased from $6.50 per hour to $7.25 per hour. The Minnesota state minimum wage is scheduled to increase to $9.50 per hour effective August 1, 2016 for large employers and to $7.75 for small employers. Further increases in the minimum wage tied to inflation are due to begin in January 2018. Unfortunately, the CPS Supplement data on households does not contain information about their

employer. Due to this data constraint, the report uses the $9.00 per hour as the prevailing minimum wage.

To illustrate the discontinuity that has existed in the minimum wage since 2010, Table 55 reports the earnings distribution for 2010 to 2014 below $16.00 per hour. During that four-year period the federal minimum wage was set at $7.25 per hour. Over that period, the number of states with minimum wages that exceeded the federal minimum wage of $7.25 per hour increased from 15 in 2010 to 24 states in 2014. The Table's columns report the hourly wage distributions in states where the federal minimum wage is the binding minimum wage and in states where the state minimum wage exceeds the federal minimum. The years from 2010 to 2014 are used because they correspond to when the federal minimum wage was always $7.25 per hour. For the study's sample which is based on employed individuals that are 18 to 64 years of age, do not utilize food stamps, and have complete information for the following variables: household structure, race and ethnicity, age, gender, educational attainment, household size, and urban residency status, a discontinuity exist at $7.25 per hour.

In states where the federal minimum wage is binding, 3.7% of workers with wages less than 16.00 per hour report earning $7.25. Just over 5.0 percent (5.6), earn between $7.26 and $7.99 per hour. In states where the state minimum wage exceeds the federal, 0.9 percent of workers earned $7.25 per hour. This jumps to 3.8 percent in the $7.26 and $7.99 per hour interval. The same pattern exists between nonwhite, less educated and single parent households.

Table 56 reports means for the food expenditure, food security and safety net participation outcomes, plus the demographic characteristics of the samples. Panel A shows that food security jumps from 76.5 to 84.9 percent when moving from $7.25 to the $7.26 and $7.99 per hour interval. The result generalizes to all of the outcomes except the expenditure measures. The differences are

probably not due to a difference in the characteristics of working heads of households in the two groups.

Panel B supports this claim. The table reveals that the basic characteristics of the individuals across the discontinuity are quite similar; supporting the premise that living in a state with a higher minimum wage is associated with lower food insecurity. The share of women and minorities is the same. Age does not differ. The educational distributions differ very little. Household composition has little variation. The only differences are in urban residence and the state unemployment rate. States with higher minimum wages tend to have more urban residents and higher unemployment rates. The take away here is that at the discontinuity, the over 8.0 jump in food security is probably not due to these small differences across the two groups. Plus, the regression analysis will control for these differences. The paper tests the hypothesis that minimum wage policy explains why food expenditures and food security are higher in states where the minimum wage exceeds the federal minimum wage. The paper test the hypothesis that minimum wage policy explains why participation in income means tested safety nets is lower in states where the state minimum wage exceeds the federal minimum wage.

The report takes a finer-grained look at the impact of minimum wage increases on food security than previous studies, seeing how much minimum wage increases add to food expenditures, how much households are moved up the food security continuum, from very low food security to low food security, or from low food security to food secure. The report also estimates relationships for each of the questions that are used to build the food security index. For example, the first question asks respondents whether they "Worried food would run out before we got money to buy more." The question clearly captures the impact that having greater financial resources, such as higher wages via an increase in the minimum wage, could improve a

household's wellbeing. The report concludes with estimates of how participation in social safety nets that are income means tested change.

Evidence from Changes in Food Expenditures

The CPS Supplement contains incidence measures on a household's grocery and fast food expenditures. These measures ask the respondent to describe their household's behavior during the last week. For example,

> *"From Sunday through Saturday, did (you/anyone in your household) shop for food at a supermarket or grocery store LAST WEEK?"*

The additional expenditure questions used in the analysis are reported in the Appendix.

Dummy variables are used to capture the variation in the incidence questions like the one just presented. A one denotes a "yes" that the household shopped for food at grocery stores, and a zero if not. Three of the questions ask respondents to provide specific dollar amounts on all of their food expenditures, grocery expenditures and fast food expenditures.

The estimates in Table 56 support the paper's hypothesis that a higher minimum wage is associated with larger food expenditures. Food and grocery expenditures are higher in states where the minimum wage exceeds the federal minimum wage. This result, which is measured with a high degree of precision holds across race, education and household structure. On average nonwhite, single parent and less educated households spend less than the typical household. The odds of consuming fast food are lower in states where the minimum wage exceeds the federal minimum wage. This finding is important because it potentially counters concern that the new dollars from the increase in the minimum wage are used to purchase non-nutritious food.

The median regressions that use food expenditures as the dependent variables yield similar patterns. Weekly expenditures on any food purchases are $5.30 higher in states where the state

minimum wage exceeds the federal minimum than in states where the federal minimum wage is the binding wage. Usual food expenditures are slightly higher at $5.81 per week. Groceries are on average $3.68 higher and fast food expenditures are on average $1.62 less in states where the state's minimum wage exceeds the federal. The estimates maintain similar patterns across race, educational and household structure.

It is important to note that the evidence in Table 57 does not rule out an increase in the purchase of junk food from the grocery store. But the dual finding that grocery expenditures rise, while fast food expenditures fall, supports the view that an increase in the minimum wage improves food security, and potentially nutrition.

Evidence from Employment and Food Security

The report's estimates of employment and food security changes associated with a 10 percent increase in the minimum wage are promising (see Table 57).[6] The regression discontinuity employment estimates confirm many of the results of many other studies, namely that increases in the minimum wage from 1995 to 2014 did not yield adverse employment effects. Furthermore, nonwhite, less-educated, and single parents experienced an improvement in their employment prospects. These demographic groups are the ones that would receive the greatest benefits from an increase in the minimum wage. The estimates are useful for the "minimum wage job loss" debate, because they come from a new data set and econometric approach, adding further support that modest increases do not reduce employment.

These food security results solve why previous studies found that there was little relationship between food security and the minimum wage. Our analysis indicates that this is because previous studies modeled food security as a binary outcome between insecurity and security, lumping both low and very low categories together. By breaking down the food security

variable into a three-point variable (very low, low security, and security), this report can measure smaller movements in food security.

The estimates reveal that a 10 percent increase in the minimum wage is associated with a 0.14 percentage point increase in food security. The impacts on the food security of nonwhite, less educated, and single parent households all exceed the overall estimate. Nonwhites and single parents are the greatest beneficiaries. The results concretely show that a movement of households drives the improvement in food security via an increase in the minimum wage from low security to food secure. For each 10 percent increase in the minimum wage, low security falls by 0.09 percentage points, while very low security falls by 0.05 percentage points. For comparison purposes, refer to the summary statistics reported in Appendix B. In all households, 8.4 percent have low food security and 5.6 percent have very low security. Thus, creating a ratio of the elasticity and the shares suggests that an increase in the minimum wage has a small impact on food insecurity. The policy simulations will demonstrate otherwise.

Still, the largest food security reduction occurs at the middle of the food security distribution. This is a critical finding. Individuals who are working have more financial resources, and have smaller gaps in their household budget. The results show that minimum wage increases can greatly reduce the plight of families who remain food insecure despite working significant hours. Thus, raising the minimum wage would allow the concentration of limited federal and local anti-hunger resources on those families at very low-levels of food security who are working fewer hours, if at all, and who are thus less likely to benefit from a minimum wage increase. Additional anti-poverty tools must be used in conjunction with increases in the minimum wage to significantly reduce poverty for all families.

Evidence from the Individual Food Security Questions

Another approach to illustrate the dynamics of an increase in the minimum wage is to analyze the responses to the individual questions that households were asked about their food situation over the past twelve months.[7] This report focuses on the questions that have three outcomes: "never true," "sometimes true," and "often true." [8]

Table 58 presents the impacts of minimum wage increases on specific aspects of food insecurity. These findings are consistent with the earlier results; namely, that food security improves because more households move from low security to food secure. The model indicates that raising the minimum wage increases the chances that a low-income family will never run out of food, and will never have to worry about running out of food before they get more money (a frequent worry of families on food stamps). The model results indicate that a 10 percent increase in the minimum wage raises a household's odds of never running out of food before they received more money by 0.78 of a percentage point. The elasticities for "sometimes true" and "often true" indicate that the reduction in never having to worry about food running out occurs because more households shift from reporting "sometimes true" to "never true." The increase in the minimum wage provides a boost to households that just fall short of security. In fact, all of the questions that require a response of "never true," "sometimes true," or "often true" have the expected signs are measured with a high level of precession.

The most important finding is that less educated, nonwhite, and single-parent households experience a greater reduction in having to worry about running out of food before they receive more money, a greater reduction in the chance that their food runs out, and a larger reduction in not being able to afford balanced meals. They also do not have to rely as much on low-cost food because they run out of money. For example, for nonwhite, less-educated and single-parent households, a 10 percent increase in the minimum wage lowers the odds of running out of food by

1.14, 0.85, and 2.11 percentage points, respectively— all higher than the reduction for the typical household.

Although smaller in magnitude and not as precisely estimated, the seventh, eighth and ninth questions that are coded by month also confirm the hypothesis that an increase in the minimum wage improves food security. An increase reduces the number of months in which adults ever cut the size of their meals or skip them because there is not enough money for food. An increase also reduces the number of months in which adults do not eat for a whole day because there is not enough money for food. The same occurs for the question that deals with responses by children.

What else does the analysis reveal by focusing on the individual food security questions? An increase in the minimum wage has a greater impact on adults. The food security questions that are directed toward children have a weaker relationship with an increase in the minimum wage. This report interprets the difference as parents choosing to sacrifice their nutritional needs before they harm the food security of their children. In addition, children benefit from free school lunches and breakfasts, meaning that their food intake is less impacted by budget constraints. An increase in the minimum wage allows them to make fewer sacrifices to their diet and food intake.[9]

What is the impact of increasing the Federal Minimum Wage to $15.00 per hour?

This report took the following steps to generate food insecurity estimates of the Norcross proposal.

1. Compute the size the minimum wage's annual increase (in percent). For example, a move from $7.25 to $8.00 per hour is a 10.34 percent increase.
2. Multiply the annual percent increase in the minimum wage by the elasticities from Table 57. This product corresponds to the predicted change in food security associated with the annual proposed increase in the minimum wage.

3. The number of affected households is the product of the number in a category (for example, food secure in a given year) and the elasticity in Step 2.
4. To compute the cumulative increase in food security and reductions in low security and very low security, this report sums the annual changes from 2016 to 2023.

Based on steps 1 to 4, and the estimates in Table 57 and the USDA's estimates of the number of households that are food secure in 2014, approximately 1.1 million households would achieve food security between 2016 and 2023.[10] It is important to note that the model does not take into account the possible loss of food stamps and tax credits for families with children as the minimum wage increases. SNAP amounts are reduced as families earn more, which could have impacts of food security. Thus, these estimates represent potential upper bounds. Nevertheless, an increase to $15.00 per hour would represent a major anti-hunger initiative—meaning that 6.7 percent of all food insecure households would be able to meet their nutritional needs without the federal government or the philanthropic sector adding to efforts to expand anti-hunger aid.

Almost 670,000 African American and Latino households would see their food security improve, corresponding to a 6.1 to 15.0 percent reduction in nonwhite insecurity. These minority households comprise 44 percent of the 1.2 million households, yet African American and Latino households comprise only 25 percent of all U.S. households. Almost one-quarter (349,000) of the impacted households are single-parent households. This corresponds to a 7.1 percent reduction in single mother household insecurity and 14.1 percent reduction for households headed by fathers. Single-parent households are 11 percent of all households. Most households that receive boost reside in urban areas. Approximately 1.0 million urban households would experience an increase in their food security, a 6.9 percent reduction in insecurity. From a regional standpoint, the largest number of beneficiaries would be in the South, where approximately, 430,000 households would

become food secure. They constitute 37 percent of the 1.2 million households that would achieve food security, quite similar to the 38 percent of all households.

Consistent with the earlier finding that the greatest impact from an increase in the minimum wage is the movement of households from low security to food secure, households that are above 185 percent of the poverty line would have the largest number of households that become food secure under the plan. A total of 652,000 households that are above 185 percent of the poverty line would also benefit from the series of increases. They comprise 56 percent of the beneficiaries, four percentage points higher than their share of all households.

Table 60 reports estimated impacts for each state. The U.S. total differs slightly from the total reported in Table 59, because the state-level estimates of food security are based on an average of the USDA data from 2012 to 2014.[11] The entries indicate that the largest number of beneficiaries will occur in California (89,000, or a 4.9 percent drop in insecurity), Texas (86,000, 5.2 percent) Florida (64,000, or 5.8 percent), Illinois (39,000, or 6.7 percent), New York (52,000, or 4.7 percent), Pennsylvania (49,000, or 8.5 percent), Ohio (36,000, or 4.5 percent), Georgia (36,000 and 5.8 percent), and North Carolina (35,000 and 5.4 percent). More interesting, are the seven states that will experience a decline in food insecurity rates of over 8.0 percent (Iowa (8.4), North Dakota (11.4), New Hampshire (9.5), New Mexico (7.1), Pennsylvania (8.5), Virginia (9.7) and Wisconsin (8.5). The households that would become secure represent 12 percent of the 1.5 million households.

Minneapolis Food Security Estimates:

Table 61 shows that Minneapolis households have lower levels of food insecurity than at the national level. However, Minneapolis' nonwhite households have food insecurity levels that

exceed nonwhites at the national level. Less-educated households in Minneapolis have lower levels of insecurity than those at the national level. The implication for the proposed increase in the municipal minimum wage is that its impact on food insecurity may not be as large as the impact of a national increase.

The estimates are created as follows. The first step in the simulation is to calculate the annual percent increase in the state's minimum wage. The state and thus the metropolitan area's minimum wage are currently at $9.00 per hour. Assuming a one-dollar increase each year yields the following in increases: $10.00 (11.1%) in 2017, $11.00 (10.0%) in 2018, $12.00 (9.1%) in 2019, $13.00 (8.3%), $14.00 (7.7%) and $15.00 (7.1%). The second step is to multiply the percent increase by the elasticities in Table 57.

This creates the predicted increase in food security for the minimum wage's annual increase. To compute the number of households that will experience an increase in food security, the estimate in Step 2 is multiplied by the number of food secure households in a given year. The base population for the estimates in line 1 is estimated by the USDA and reported in Appendix B. The base population for all other rows was estimated using the micro data in the CPS Food Security Supplement. The household supplement weight was used along with the food security information to create an estimate of each status. The last column is the ratio of the cumulative total and the column labeled "2012–2014 Food Insecurity".

Table 62 shows that increasing the minimum wage to $15.00 per hour would reduce insecurity in the Minneapolis metro area by 17,000 households, a 6.9 percent drop. Among the most vulnerable groups, nonwhites in the metropolitan area would experience a 4.9 percent drop in insecurity. Single parent and less educated households would experience a 5.8 to 3.8 percent drop in insecurity.

What is the impact on Social Safety Net Participation?

Another question that has received limited attention in the literature is whether the use of means-tested public support programs falls when an increase in the minimum wage occurs. The increase in the minimum wage raises a family's gross income. They may become ineligible or have a reduction in their benefits, such as SNAP. Some argue that because of the reduction or loss in benefits, on net households may be worse off after the minimum wage increase. However, on the other hand, the increase in the minimum wage could more than offset the loss in benefits.

The CPS Supplement contains participation information on SNAP, WIC, Free/Reduced Lunch and the Emergency Food Assistance Program. All have means test based on income. The following summarizes the income eligibility requirements for each program on which data is available in the Supplement.

SNAP Income Eligibility:

To understand the potential impact of an increase in the minimum wage on SNAP eligibility, I describe how eligibility is determined. First, household size is determined. Second, gross monthly income (e.g., earned income plus social security income equals gross income) is calculated. Third, it is determined whether gross monthly income doesn't exceed 130 percent of the poverty line. If gross monthly income doesn't exceed the limit for a given household size, then the net income test is conducted. To do this, nine deductions are subtracted from earned income to create net income.[12]

If a household's net income is less than the amount allowed for a given household size, then the household is eligible for SNAP benefits. The primary way that an increase in the minimum wage will impact SNAP eligibility is by raising earned income that in turn raises gross income. This increase might push the household above the income threshold and thus make them ineligible for SNAP benefits.

WIC Income Eligibility

To be eligible for WIC benefits, applicants must meet one of two requirements. The household must have income at or below a level or standard set by their State agency. The State agency's income standard must be between 100 percent of the Federal poverty guidelines (issued each year by the Department of Health and Human Services), but cannot be more than 185 percent of the Federal poverty income guidelines.

The household can also be automatically income-eligible for WIC if they participate in certain programs. These include individuals if they are:

- Eligible to receive SNAP benefits, Medicaid, for Temporary Assistance for Needy Families,
- In families where members are eligible to receive Medicaid or TANF, or
- Individuals in other State-administered programs.

So, the issue here is whether the increase in the minimum wage pushes the household's income above the value set by their State's agency, or the increase leads to ineligibility for other programs.

Free/Reduced Breakfast and Lunch Income Eligibility:

The eligibility requirements for Free-Reduced Lunch are simpler than WIC and SNAP. The guidelines for free meals and milk and reduced price meals are constructed by multiplying the 2016 Federal income poverty guidelines by 1.30 and 1.85, respectively, and by rounding the result upward to the next whole dollar.[13]

Emergency Food Assistance Program Eligibility

The Emergency Food Assistance Program (TEFAP) helps supplement the diets of low-income Americans, including elderly people. The emergency food assistance is provided at no cost. Through TEFAP, the U.S. Department of Agriculture (USDA) purchases a variety of nutritious,

high-quality USDA Foods, and makes the food available to State Distributing Agencies. Food allocations are based on the number of unemployed persons and the number of people with incomes below the State's poverty level. States typically provide the food to local organizations, such as soup kitchens and food pantries. States also provide the food to community action agencies, which also distribute the foods directly to low-income households.[14]

I use two approaches to identify the impact of an increase in the minimum wage on means-tested program participation. The first is to replace the dependent variables in the RD models with CPS Supplement indicators of program participation. I maintain the same assumption that households in states with minimum wages that just exceed the federal are similar in their characteristics. The only factor that differs across the two groups is minimum wage policy.

The CPS Supplement contains respondent's information on participation in several means-tested programs: WIC, SNAP, free reduced lunch and breakfast, and emergency food pantries. The period over which the respondent is asked to describe their experience varies. They either capture the last 30 days or last 12 months. Specifically, SNAP and emergency food pantry usage covers the last 12 months. WIC and the free/reduced lunch and breakfast programs capture experiences during the last 30 days.

Table 57 reports the partial derivatives from probit RD models for each incidence measure. The research team obtained mixed results. SNAP and free/reduced lunch participation falls while the use of WIC and Emergency Food Pantries increases. Except for nonwhites, the increase in WIC is much smaller than the decline in SNAP and the lunch and breakfast programs. Food pantry usage seems large, but a very small portion of the sample utilizing this program.

Minneapolis Estimates:

Panel A of Table 63 presents estimates of how an increase in the metropolitan area's minimum wage to $15.00 per hour would impact participation in SNAP, WIC and the Free/Reduced Lunch Program. Panel B of the table shows how household expenditures of residents might be impacted with the associated increase in the metro area's minimum wage to $15.00 per hour. From the CPS Supplements, I estimate that the average hourly wage would need to be increased by $4.50 per hour to reach $15.00 per hour. To construct the predicted effects on household expenditures and safety net participation, I multiply the estimated coefficients by the $4.50 per hour increase. For SNAP, WIC, and Free/Reduced Lunch participation, I have direct estimates of metro or county participation. For these programs, I can also predict the number impacted. These estimates are the last row of Panel A.

The estimates in Panel A indicate that the increase in the minimum wage to $15.00 per hour will not lead to a major decline in SNAP, WIC and Free/Reduced Lunch Program participation. Approximately 600 Hennepin County families with children out of an almost 42,000 families with kids that are currently utilizing the program would see their eligibility end. Only around 30 women with children would see an end to their WIC benefits.

Yet on the other hand, the increase to $15.00 per hour will have a significant positive impact on local food expenditures. The odds of spending money at grocery stores will jump by almost 28 percent, while a 10.0 percent drop in fast food expenditures will occur. Usual food expenditures will rise on average by $26.00 per work. Average weekly grocery expenditures will jump by around $17.00. Average weekly fast food expenditures will fall by approximately $7.30. The increase in the minimum wage at the local level will raise food expenditures. This increase will improve household food security while at the same time acting as a stimulus to the local macroeconomic economy.

Summary

This report provides estimates of the impact that increasing the Minneapolis area's minimum wage to $15.00 per hour would have on the area's families. Approximately 17,000 Metropolitan Area households will become food secure, leading to a 6.9 percent drop in food insecurity.

- 3,000 of the drop would be among nonwhite households, representing a 4.9 percent drop in insecurity
- 4,000 less educated households would experience an improvement in their food security status. This statistic translates into a 3.8 percent reduction in food insecurity
- Although only 2,000 single parent households would become food secure, they account for a 5.8 percent drop in food security for this vulnerable group
- The report's estimates indicate that the increase in the minimum wage to $15.00 per hour will not lead to a major decline in SNAP, WIC and Free/Reduced Lunch Program participation
- Approximately 600 Hennepin County families with children of the almost 42,000 families participating in the program would lose eligibility
- Only around 30 women with children would see an end to their WIC benefits
- Yet, on the other hand, the increase to $15.00 per hour will have a significant positive impact on local food expenditures
    - The odds of spending money at grocery stores will jump by almost 28 percent, while a 10.0 percent drop in fast food expenditures will occur
    - Usual food expenditures will rise on average by $26.00 per week. Average weekly grocery expenditures will jump by around $17.00

- Usual food expenditures estimate total food cost, weekly grocery expenditures estimate grocery costs
- Average weekly fast food expenditures will fall by approximately $7.30

The increase in the minimum wage at the local level will raise food expenditures. This increase will improve household food security while at the same time acting as a stimulus to the local macroeconomic economy.

Illustration of Discontinuity at $7.25 Per Hour (Nominal Hourly Wage Distributions for 2010 to 2014 by Minimum Wage)

Table 55 – Distributions of Hourly Wages

	All		Nonwhite		Less Educated		Single Parents	
Range of State Minimum Wage	**Federal**	**State**	**Federal**	**State**	**Federal**	**State**	**Federal**	**State**
Less than $4.25	0.6%	0.5%	0.5%	0.5%	0.6%	0.5%	0.6%	0.4%
$4.25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
$4.26 to 4.74	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%
$4.75	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
$4.76 to 5.14	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%	0.2%	0.2%
$5.15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
$5.16 to 5.84	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.2%	0.2%
$5.85 to 6.54	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
$6.55	0.4%	0.4%	0.6%	0.2%	0.4%	0.4%	0.4%	0.3%
$6.56 to 7.24	1.0%	0.9%	1.6%	1.0%	1.2%	1.0%	1.6%	1.1%
$7.25	**3.7%**	**0.9%**	**4.1%**	**1.0%**	**4.3%**	**1.0%**	**5.1%**	**0.8%**
$7.26 to 7.99	**5.6%**	**3.8%**	**6.5%**	**3.7%**	**6.3%**	**4.3%**	**6.9%**	**4.3%**
$8.00	6.5%	6.5%	7.8%	7.9%	7.1%	7.4%	6.6%	7.7%
$8.01 to 8.99	7.4%	9.0%	8.0%	9.5%	7.9%	10.0%	9.0%	10.7%
$9.00	5.9%	6.8%	7.3%	8.6%	6.5%	7.7%	6.3%	7.6%
$9.01 to 9.99	6.0%	6.4%	5.4%	6.4%	6.2%	6.4%	6.7%	7.2%
$10.00	9.4%	10.6%	9.5%	12.3%	9.5%	10.6%	9.1%	11.3%
$10.01 to 10.99	6.0%	5.9%	5.9%	5.1%	6.0%	5.9%	6.2%	5.8%
$11.00	4.1%	3.9%	4.0%	4.0%	3.9%	3.8%	3.5%	3.8%
$11.01 to 11.99	4.8%	4.9%	4.5%	4.3%	4.6%	4.5%	4.5%	5.0%
$12.00	6.1%	6.7%	6.2%	6.9%	5.8%	6.3%	5.3%	6.7%
$12.01 to 12.99	5.4%	5.7%	4.9%	4.9%	5.1%	5.5%	5.1%	4.7%
$13.00	3.5%	3.7%	3.6%	3.9%	3.5%	3.5%	3.3%	2.7%
$13.01 to 13.99	5.3%	4.5%	5.0%	3.9%	4.9%	4.4%	5.2%	3.9%
$14.00	3.7%	3.7%	3.3%	3.3%	3.3%	3.1%	2.8%	2.9%
$14.01 to 14.99	4.1%	4.1%	3.3%	3.5%	3.8%	3.6%	3.5%	3.6%
$15.00	6.1%	7.0%	4.9%	6.3%	5.3%	6.1%	4.6%	6.2%
$15.01 to 15.99	4.0%	3.8%	3.0%	2.6%	3.6%	3.6%	3.2%	2.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes: The columns labeled "Federal" shows the hourly wage distribution in states where the federal minimum wage is the binding minimum wage. The columns labeled "State" show the hourly wage distribution in states where the state minimum wage exceeds the federal minimum. The hourly wage distributions are for 2010 to 2014 when the federal minimum wage was always $7.25 per hour. The samples consist of householders that are 18 to 64 years of age, and have complete information for the following variables: household structure, race and ethnicity, age, gender, educational attainment, household size, and urban residency status. These samples do not exclude households that utilize food stamps. Hourly wages are only available for householders surveyed in the out rotation groups.

Summary Statistics for Workers at the $7.25 per hour Discontinuity (2010 to 2014)

Table 56 – Summary Statistics for Minimum Wage Workers

	Federal Min. Wage at 7.25		**Federal Min. Wage 7.26 to 7.99**	
Panel A: Outcomes	**$7.25**	**$7.26 to 7.99**	**$7.25**	**$7.26 to 7.99**
Hourly Wage of Worker	7.25	7.58	7.25	7.60
Shop at Grocery Store	0.276	0.274	0.213	0.251
Fast Food	0.492	0.520	0.432	0.537
Any Food Expenditures	113.0	106.6	84.1	103.7
Usual Food Expenditures	111.2	106.3	84.5	103.8
Grocery Store Expenditures	99.2	93.1	73.4	93.5
Fast Food Expenditures	22.9	18.7	21.3	19.3
Food Security	0.675	0.723	0.860	0.788
Low Security	0.198	0.173	0.100	0.151
Very Low Security	0.127	0.104	0.040	0.061
Worried food would run out	0.091	0.074	0.037	0.052
Food didn't Last	0.054	0.048	0.025	0.032
Couldn't afford balanced meals	0.069	0.082	0.012	0.041
Relied on low-cost food	0.019	0.025	0.000	0.012
Couldn't feed children a balanced meal	0.019	0.010	0.000	0.000
Children not eating enough	0.008	0.003	0.000	0.000
Adults cut the size of meals	0.161	0.131	0.049	0.093
Not eat for a whole day	0.008	0.014	0.000	0.000
Children ever skip meals	0.000	0.001	0.000	0.000
SNAP	0.209	0.171	0.062	0.152
WIC	0.083	0.065	0.000	0.032
Free/Reduced Breakfast	0.121	0.099	0.037	0.070
Free/Reduced Lunch	0.141	0.128	0.038	0.117
Emergency Pantry	0.099	0.093	0.049	0.059
Notes: See end of table.				

Cont.: Summary Statistics for Workers at the $7.25 per hour Discontinuity (2010 to 2014)

	Federal Min. Wage at 7.25		Federal Min. Wage 7.26 to 7.99	
Panel B: Demographic Characteristics	**$7.25**	**$7.26 to 7.99**	**$7.25**	**$7.26 to 7.99**
Female	0.657	0.634	0.654	0.619
Latino	0.180	0.168	0.198	0.201
African American	0.176	0.189	0.136	0.128
Native American	0.006	0.009	0.000	0.026
Asian	0.029	0.037	0.099	0.032
Age	32.0	32.1	32.1	32.1
HS Dropout	0.234	0.215	0.210	0.230
HS Graduate	0.674	0.657	0.679	0.645
AA Degree	0.046	0.061	0.074	0.064
Single Dad	0.100	0.067	0.025	0.076
Single Mom	0.280	0.267	0.222	0.230
Individual Male	0.075	0.083	0.086	0.113
Individual Female	0.088	0.090	0.111	0.131
Number in Household	3.5	3.5	3.4	3.3
Urban Residence	0.692	0.719	0.840	0.831
State Unemployment Rate	7.3	7.1	8.2	8.3
Sample Size	522	804	81	334

Notes: The columns show the mean characteristics of hourly wage workers in states where the federal minimum wage is the binding minimum wage and in states where the state minimum wage exceeds the federal minimum. The years from 2010 to 2014 are used because they correspond to when the federal minimum wage was always $7.25 per hour. The samples consist of individuals that are 18 to 64 years of age, do not utilize food stamps, and have complete information for the following variables: household structure, race and ethnicity, age, gender, educational attainment, household size, and urban residency status.

Regression Discontinuity Estimates of Minimum Wage's Impact on Household Expenditures, Food Security, and Safety Nets

Table 57 – Estimates of Household Expenditures after Minimum Wage

Probability of Outcome	**All**	**Nonwhite**	**Less Educated**	**Single Parents**
Employment	0.3815[a]	0.3972[a]	0.4746[a]	0.3443[a]
Food Secure	0.1414[a]	0.2774[a]	0.1514[a]	0.5031[a]
Low Security	-0.0942[a]	-0.1781[a]	-0.0956[a]	-0.3013[a]
Very-Low Security	-0.0472[a]	-0.0993[a]	-0.0558[a]	-0.2018[a]
Shop at Grocery Store	6.10%[a]	4.22%[a]	5.88%[a]	4.57%[a]
Fast Food	-2.14%[a]	-0.38%[a]	-2.13%[a]	-1.05%[a]
Weekly Expenditures				
Any Food	5.30[a]	2.65[b]	3.52[a]	2.35[a]
Usual Food	5.81[a]	6.03[a]	4.98[a]	4.82[a]
Grocery	3.68[a]	1.90[b]	3.40[a]	3.17[a]
Fast Food	-1.62[a]	-2.56[a]	-2.08[a]	-1.50[a]
Safety Net Participation				
SNAP	-0.318%[a]	-0.866%[a]	-0.610%[a]	-1.015%[a]
WIC	0.031%[b]	0.342%[a]	0.069%[a]	0.030%
Free/Reduced Breakfast	-0.190%[a]	-0.379%[a]	-0.343%[a]	-1.08%[a]
Free/Reduced Lunch	-0.236%[a]	-0.313%[a]	-0.399%[a]	-1.122%[a]
Emergency Food Pantry	0.206%[a]	0.484%[a]	0.387%[a]	0.212%[b]

Notes: Author's calculations for the incidence measures come from the 1996 to 2014 CPS Food Supplements. The expenditure calculations come from the 2011 to 2014 Supplements. The samples consist of individuals that are 18 to 64 years of age, do not utilize food stamps, and have complete information for the following variables: household structure, race and ethnicity, age, gender, educational attainment, household size, and urban residency status. The models also include year and state dummy variables. Nonwhites are African American, Latino, Asian or Native American. Less Educated have no more than a high school degree. The sample sizes for the incidence measures are as follows: All (1.1 million), Nonwhite (250,000), Less Educated (600,000), and Single Parents (160,000). The sample sizes for the expenditures measures are as follows: All (220,000), Nonwhite (560,000), Less Educated (120,000) and Single Parents (35,000).

Estimates for Employment, Shop at Grocery Store and Fast Food are RD parametric "Zero Order" probit models of the outcome for each question on a constant, a dummy variable that equals 1 if the state's minimum wage exceeds the federal minimum wage and 0 if the federal minimum wage is the binding wage, and the rating variable. The entries measure the impact that a ten percent increase in the minimum wage has on the probability of employment and food security.

The Food Secure, Low Security and Very-Low Security entries are RD parametric "Ordered Probit" Models. They capture the impact that a ten percent increase in the minimum wage has on the probability of food security, low security, and very-low security. The entries for this model measure the percentage point difference in food security between states with minimum wages that exceed the federal and states where the federal is binding.

The models labeled "Expenditures" are "Zero Order" median regressions where household expenditures on food are the dependent variable. All models control for the characteristics described above. The entries measure the percentage point or dollar difference in household expenditures between states with minimum wages that exceed the federal and states where the federal is binding.

An "a" denotes 1 percent level of significance. A "b" denotes 5 percent level of significance, and a "c" denotes the 10 percent level of significance. The significance levels correspond to 2.576 for 1 percent level, 1.960 for 5 percent, and 1.645 for 10 percent.

Parametric RD Models for Log Minimum Wage's Impact on Food Security Components

(Impact of a 10 Percent Increase in the Minimum Wage on Food Security's Components)

Table 58 – Change in Food Security after Minimum Wage

Panel A: All	**Never True**	**Sometimes True**	**Often True**
Worried food would run out before we got money to buy more. (SN)	0.773[a]	-0.612[a]	-0.161[a]
Food just bought didn't last and didn't have money to get more. (SN)	0.565[a]	-0.470[a]	-0.094[a]
Couldn't afford balanced meals.	0.380[a]	-0.292[a]	-0.088[a]
Relied on low-cost food because run out of money.	0.256[a]	-0.223[a]	-0.033[a]
Couldn't feed our children a balanced meal, because we could not afford it.	0.153[a]	-0.137[a]	-0.015[a]
The children were not eating enough because we just couldn't afford enough food (SN)	0.052[a]	-0.047[a]	-0.005[a]
Component	**Only 1 or 2 months**	**Some months, but not every month**	**Almost every month**
Almost every month did adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?	0.096[b]	-0.054[b]	-0.042[b]
Almost every month did adults in your household ever not eat for a whole day because there wasn't enough money for food?	-0.005	0.002	0.002
Almost every month did any of the children ever skip meals because there wasn't enough money for food?	0.009[c]	-0.006[c]	-0.003[c]

Notes: See end of table

Cont.: Ordered Probit and Parametric RD Models for Log Minimum Wage's Impact on Food Security Components

(Impact of a 10% Increase in the Minimum Wage on Food Security's Components)

Panel B: Nonwhite	**Never True**	**Sometimes True**	**Often True**
Worried food would run out before we got money to buy more. (SN)	1.141[a]	-0.843[a]	-0.298[a]
Food just bought didn't last and didn't have money to get more. (SN)	0.915[a]	-0.721[a]	-0.193[a]
Couldn't afford balanced meals.	0.668[a]	-0.500[a]	-0.168[a]
Relied on low-cost food because run out of money.	0.421[a]	-0.347[a]	-0.074[a]
Couldn't feed our children a balanced meal, because we could not afford it.	0.238[a]	-0.208[a]	-0.029[c]
The children were not eating enough because we just couldn't afford enough food	0.163[b]	-0.144[b]	-0.019[c]
Component	**Only 1 or 2 months**	**Some months, but not every month**	**Almost every month**
Almost every month did adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?	0.234[b]	-0.139[b]	-0.095[b]
Almost every month did adults in your household ever not eat for a whole day because there wasn't enough money for food?	0.062	-0.036	-0.026
Almost every month did any of the children ever skip meals because there wasn't enough money for food?	0.014	-0.010	-0.004

Notes: See end of table.

Cont.: Ordered Probit and Parametric RD Models for Log Minimum Wage's Impact on Food Security Components

(Impact of a 10% Increase in the Minimum Wage on Food Security's Components)

Panel C: Less Educated	**Never True**	**Sometimes True**	**Often True**
Worried food would run out before we got money to buy more. (SN)	0.851[a]	-0.637[a]	-0.214[a]
Food just bought didn't last and didn't have money to get more. (SN)	0.742[a]	-0.592[a]	-0.150[a]
Couldn't afford balanced meals.	0.399[a]	-0.293[a]	-0.106[a]
Relied on low-cost food because run out of money.	0.366[a]	-0.312[a]	-0.054[a]
Couldn't feed our children a balanced meal, because we could not afford it.	0.224[a]	-0.198[a]	-0.026[a]
The children were not eating enough because we just couldn't afford enough food	0.075[a]	-0.066[a]	-0.008[b]
Component	**Only 1 or 2 months**	**Some months, but not every month**	**Almost every month**
Almost every month did adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?	0.037	-0.020	-0.017
Almost every month did adults in your household ever not eat for a whole day because there wasn't enough money for food?	-0.013	0.007	0.006
Almost every month did any of the children ever skip meals because there wasn't enough money for food?	0.012	-0.008	-0.004

Notes: See end of table.

Cont.: Ordered Probit and Parametric RD Models for Log Minimum Wage's Impact on Food Security Components

(Impact of a 10% Increase in the Minimum Wage on Food Security's Components)

Panel D: Single Parents	**Never True**	**Sometimes True**	**Often True**
Worried food would run out before we got money to buy more. (SN)	2.114[a]	-1.481[a]	-0.632[a]
Food just bought didn't last and didn't have money to get more. (SN)	1.752[a]	-1.331[a]	-0.420[a]
Couldn't afford balanced meals.	1.303[a]	-0.930[a]	-0.372[a]
Relied on low-cost food because run out of money.	1.157[a]	-0.891[a]	-0.266[a]
Couldn't feed our children a balanced meal, because we could not afford it.	0.860[a]	-0.710[a]	-0.150[a]
The children were not eating enough because we just couldn't afford enough food	0.363[a]	-0.304[a]	-0.059[a]
Component	**Only 1 or 2 months**	**Some months, but not every month**	**Almost every month**
Almost every month did adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?	0.165	-0.086	-0.079
Almost every month did adults in your household ever not eat for a whole day because there wasn't enough money for food?	-0.012	0.006	0.006
Almost every month did any of the children ever skip meals because there wasn't enough money for food?	0.032	-0.019	-0.013

Notes: Author's calculations from the 1996 to 2014 CPS Food Supplements. The samples consist of individuals that are 18 to 64 years of age, do not utilize food stamps, and have complete information for the following variables: household structure, race and ethnicity, age, gender, educational attainment, household size, and urban residency status. The excluded categories are non-household heads, men, whites, college graduates, dual households, and non-urban residence. The models also include year and state dummy variables. The reported RD model is a "Zero Order" ordered probit model of the outcome for each question on a constant, a dummy variable that equals 1 if the state's minimum wage exceeds the federal minimum wage and 0 if the federal minimum wage is the binding wage, and the rating variable. All models control for the characteristics described above. The entries measure the percentage point difference in food security between states with minimum wages that exceed the federal and states where the federal is binding. An "a" denotes 1 percent level of significance. A "b" denotes 5 percent level of significance, and a "c" denotes the 10 percent level of significance. The significance levels correspond to 2.576 for 1 percent level, 1.960 for 5 percent, and 1.645 for 10 percent. The term "(SN)" refers to a question that was used in Sabia and Nielson (2012).

Simulations of Norcross Proposal to Hike the Federal Minimum Wage to $15.00 per hour

Table 59 – Food Security after Norcross Proposal

Category	Cumulative Total	As Percent of 2014 Insecurity
All households	1,159,000	6.7%
Household composition:		
With children < 18	341,000	4.6%
With children < 6	149,000	4.4%
Married-couple families	241,000	7.7%
Female head, no spouse	250,000	7.1%
Male head, no spouse	99,000	14.1%
Other household with child	5,000	3.7%
With no children < 18	812,000	8.2%
More than one adult	493,000	10.1%
Women living alone	175,000	6.0%
Men living alone	142,000	6.7%
Race/ethnicity of households:		
White non-Hispanic	811,000	9.2%
Black non-Hispanic	244,000	6.1%
Hispanic	268,000	7.4%
Other	156,000	15.9%
Household income-to-poverty ratio:		
Under 1.00	104,000	1.7%
Under 1.30	141,000	1.8%
Under 1.85	225,000	2.1%
1.85 and over	652,000	16.1%
Income unknown	278,000	10.0%
Area of residence:		
Inside metropolitan area	982,000	6.9%
In principal cities	325,000	5.8%
Not in principal cities	495,000	8.1%
Outside metropolitan area	172,000	5.3%
Census geographic region:		
Northeast	208,000	7.1%
Midwest	255,000	6.8%
South	430,000	6.1%
West	262,000	7.2%

Notes: The estimates are created as follows. The first step is to calculate the annual percent increase in the federal minimum wage. The second step is to multiply the percent increase by the elasticities in Table 57. This is the increase in food security for the minimum wage's annual increase. To compute the number of households that will experience an increase in food security, the number of food secure households multiplies the estimate in Step 2 in a given year. The initial 2014 values are reported in Appendix B

Simulations of Norcross Proposal to Hike the Federal Minimum Wage to $15.00 per hour

Table 60 – Food Security after Norcross Proposal by State

		Reduction in Food Insecurity	
State	**Actual 2014 Food Insecurity**	**Total**	**As a Percent of 2014 Food Insecurity**
U.S.	17,549,389	1,139,000	6.5
AK	32,640	2,000	6.1
AL	326,592	18,000	5.5
AR	231,636	10,000	4.3
AZ	403,480	21,000	5.2
CA	1,825,065	89,000	4.9
CO	286,824	16,000	5.6
CT	195,017	9,000	4.6
DC	41,316	1,000	2.4
DE	44,407	3,000	6.8
FL	1,104,000	64,000	5.8
GA	618,580	36,000	5.8
HI	56,826	4,000	7.0
IA	143,640	12,000	8.4
ID	86,010	6,000	7.0
IL	578,331	39,000	6.7
IN	386,608	24,000	6.2
KS	186,030	11,000	5.9
KY	321,300	16,000	5.0
LA	314,688	16,000	5.1
MA	255,552	18,000	7.0
MD	285,625	21,000	7.4
ME	89,586	4,000	4.5
MI	583,884	31,000	5.3
MN	224,224	15,000	6.7
MO	409,416	20,000	4.9
MS	249,920	10,000	4.0
MT	48,990	3,000	6.1
NC	649,797	35,000	5.4
ND	26,208	3,000	11.4
NE	106,196	6,000	5.6
NH	52,400	5,000	9.5
NJ	385,047	25,000	6.5
NM	99,015	7,000	7.1

		Reduction in Food Insecurity	
State	**Actual 2014 Food Insecurity**	**Total**	**As a Percent of 2014 Food Insecurity**
NV	168,872	8,000	4.7
NY	1,104,336	52,000	4.7
OH	805,961	36,000	4.5
OK	246,510	14,000	5.7
OR	248,745	9,000	3.6
PA	579,690	49,000	8.5
RI	53,594	3,000	5.6
SC	270,077	18,000	6.7
SD	40,936	3,000	7.3
TN	431,624	24,000	5.6
TX	1,654,640	86,000	5.2
UT	127,015	9,000	7.1
VA	318,150	31,000	9.7
VT	32,886	2,000	6.1
WA	371,544	16,000	4.3
WI	269,154	23,000	8.5
WV	117,198	6,000	5.1
WY	33,740	2,000	5.9

Notes: See Table 59 for detailed description of how the estimates are generated. A state's estimate is adjusted for the fact that several have state minimum wages that exceed the federal minimum wage. For example, the increase in the federal minimum wage does not become binding until 2019 for the District of Columbia, and 2018 for Minnesota, Vermont, Washington, Rhode Island, Oregon, Massachusetts, Connecticut, and California

2012-2014 Average Food Security Estimates

Table 61 –Food Security

U.S.	**All**	**Nonwhite**	**Less Educated**	**Single Parents**
Food Secure	85.8%	79.2%	79.5%	71.3%
Food Insecurity	14.2%	20.8%	20.5%	28.7%
Low Food Security	8.9%	13.8%	12.6%	18.2%
Very Low Food Security	5.4%	7.0%	8.0%	10.6%
Minneapolis-St. Paul-Bloomington				
Food Secure	90.4%	77.2%	83.2%	71.2%
Food Insecurity	9.6%	22.8%	16.8%	28.8%
Low Food Security	5.9%	15.9%	10.1%	17.6%
Very Low Food Security	3.7%	6.9%	6.7%	11.2%

Notes: Author's calculations from the 2012 to 2014 CPS Food Supplements. Entries are the average estimate from 2012 to 2014. The annual values are calculated as follows. Consistent with the USDA's practice, I limit the sample of households to those with complete income and food security information. For a given year, I use the household supplement weight and the food security measures to generate weighted means (e.g., percentages). The average of the estimates for 2012, 2013 and 2014 are reported above.

Simulations of Increasing the Minneapolis Minimum Wage to $12 and $15 per hour on Metro Area Households

Table 62 – Simulated Food Security after Minimum Wage – Subgroups

		Estimated Impact of Increasing Minneapolis Minimum Wage			
		$12.00 per hour		$15.00 per hour	
Demographic Group	**2012-2014 Food Insecurity**	**Cumulative Total**	**% Reduction in Insecurity**	**Cumulative Total**	**% Reduction in Insecurity**
All	244,684	10,000	4.1	17,000	6.9
Nonwhite	61,643	2,000	3.2	3,000	4.9
Less Educated	106,651	2,000	1.9	4,000	3.8
Single Parent	34,774	1,000	2.9	2,000	5.8

Notes: The estimates are created as follows. The first step is to calculate the annual percent increase in the state's minimum wage. The state's minimum wage is currently at $9.00 per hour. Assuming a one dollar increase each year yields the following in increases: $10.00 (11.1%) in 2017, $11.00 (10.0%) in 2018, $12.00 (9.1%) in 2019, $13.00 (8.3%), $14.00 (7.7%) and $15.00 (7.1%). The second step is to multiply the percent increase by the elasticities in Table 57. This creates the predicted increase in food security for the minimum wage's annual increase. To compute the number of households that will experience an increase in food security, the number of food secure households multiplies the estimate in Step 2 in a given year. The base population for the estimates in line 1 is estimated by the USDA and reported in Appendix B. The base population for all other rows was estimated using the micro data in the CPS Food Security Supplement. The household supplement weight was used along with the food security information to create an estimate of each status. The last column is the ratio of the cumulative total and the column labeled "2012-2014 Food Insecurity."

Regression Discontinuity Effects of Increasing Wages on the Use of Minneapolis Metro Area Public Assistance and Food Expenditures

Table 63 – Simulated Change in Program Participation after Minimum Wage

Panel A: Social Safety Nets	**Incidence of Weekly Use of Public Support**					
Category	**Any Program**	**SNAP**	**WIC**	**F/R Breakfast**	**F/R Lunch**	**Emergency Food Pantry**
Estimated Coefficient	-0.06%	-0.32%	0.03%	-0.19%	-0.24%	0.21%
Predicted Effect (percent)	-0.27%	-1.43%	0.14%	-0.86%	-1.06%	0.93%
Participation		41,682	20,903		22,919	
Number Affected		-596	29		-243	
Panel B: Expenditures	**Incidence**		**Weekly Expenditures (dollars)**			
Category	**Shop at Grocery Store**	**Fast Food**	**Any Food**	**Usual Food**	**Groceries**	**Fast Food**
Estimated Coefficient	6.1%	-2.1%	5.30	5.81	3.68	-1.62
Predicted Effect (percent)	27.5%	-9.6%	23.87	26.16	16.56	-7.28

Notes: Author's calculations for the incidence measures come from the 1995 to 2014 CPS Food Supplements. The expenditure calculations come from the 2011 to 2014 Supplements. The samples consist of individuals that are 18 to 64 years of age, who may utilize food stamps, and have complete information for the following variables: household structure, race and ethnicity, age, gender, educational attainment, household size, and urban residency status. The models also include year and state dummy variables. Nonwhites are African American, Latino, Asian or Native American. Less Educated have no more than a high school degree. The sample sizes for the incidence measures are as follows: All (1.1 million), Nonwhite (250,000), Less Educated (600,000), and Single Parents (160,000). The sample sizes for the expenditures measures are as follows: All (220,000), Nonwhite (560,000), Less Educated (120,000) and Single Parents (35,000).

Estimates for Shop at Grocery Store and Fast Food are RD parametric "Zero Order" probit models of the outcome for each question on a constant, a dummy variable that equals 1 if the state's minimum wage exceeds the federal minimum wage and 0 if the federal minimum wage is the binding wage, and the rating variable. The row entries labeled "Estimated Coefficient" measure the impact that a ten percent increase in the minimum wage has on the probability of employment and food security.

The models labeled "Weekly Expenditures" are "Zero Order" median regressions where household expenditures on food are the dependent variable. All models control for the characteristics described above. The row entries labeled "Estimated Coefficient" measure the percentage point or dollar difference in household expenditures between states with minimum wages that exceed the federal and states where the federal is binding.

The row entries labeled "Predicted Effect" are the product of multiplying the estimated coefficient by the average increase needed to raise the metropolitan area's minimum wage to $15.00 per hour. In my sample, this corresponds to $4.50 per hour.

The SNAP and WIC estimate of the number of affected are for Hennepin County. SNAP is the number of family with kids that would be impacted. WIC is the total number of women, infants and children that would be impacted. Free/Reduced Lunch is the number of children in the Minneapolis School District that would be impacted

APPENDIX A: CPS SUPPLEMENT QUESTIONS

Expenditure Questions

These first questions are about all the places at which you bought food LAST WEEK. By LAST WEEK, I mean from Sunday through Saturday. First, did (you/anyone in your household) shop for food at a supermarket or grocery store LAST WEEK? (Hes1a)

LAST WEEK, did (you/anyone in your household) buy food at a restaurant, fast food place, cafeteria or vending machine? (Include any children who may have bought food at the school cafeteria). (hes1c)

The total amount spent on any food last week. (HETS8O)

The USUAL amount spent on food at all the different places that have been talked about in a week. (HETS8OU)

Amount of money spent by the household on purchases at super-markets and grocery stores. (HETS2O)

How much money was spent by the household for food at restaurants, fast food places, cafeterias and vending machines last week. (HETS6O)

Food Security Questions

For the first six statements, respondent answers are coded as the following:

- Worried food would run out before we got money to buy more.
- Food just bought didn't last and didn't have money to get more.
- Couldn't afford balanced meals.
- Relied on low-cost food because run out of money.
- Couldn't feed our children a balanced meal, because we could not afford it.
- The children were not eating enough because we just couldn’t afford enough food

For the next three questions, respondents’ answers are coded as the following:

- Almost every month did adults in your household ever cut the size of your meals or skip meals because there wasn’t enough money for food?
- Almost every month did adults in your household ever not eat for a whole day because there wasn’t enough money for food?

- Almost every month did any of the children ever skip meals because there wasn't enough money for food?

Safety Net Questions

In the past 12 months, since December of last year, did (you/anyone in this household) get SNAP/Supplemental Nutrition Assistance Program or food stamp benefits? (HESP1)

During the past 30 days, did any (women/women or children/children) in this household get food through the WIC program? (HESP8)

During the past 30 days, did any children in the household (between 5 and 18 years old) receive free or reduced-cost lunches at school? (HESP6)

During the past 30 days, did any children in the household (between 5 and 18 years old) receive free or reduced-cost breakfasts at school? (HESP7)

In the last 12 months, did (you/you or other adults in your household) ever get emergency food from a church, a food pantry, or food bank? (HESC3)

These five incidence questions are coded as 1 if the householder responded yes, and 0 if they answered no. Households that were not required to answer the question because they did not meet the screening guidelines are given a no answer. For example, to be asked the SNAP usage question, a household has to either be poor (HRPOOR = 1) or they had to be coded yes, don't know, refused, or no response to the following question:

"People do different things when they are running out of money for food in order to make their food or their food money go further. In the last 12 months, since December of last year, did you ever run short of money and try to make your food or your food money go further?" (HES9)

The latter allows for the possibility that non-poor households could be included in the sample.

APPENDIX B: U.S. HOUSEHOLDS, BY FOOD SECURITY STATUS AND SELECTED HOUSEHOLD CHARACTERISTICS, 2014

Table 64 – Food Security by Demographic

				Insecure						
						With low food security		With very low food security		
Category	**Total**	**Food secure**		**All**						
	1,000s	**1,000s**	**percent**	**1,000s**	**Percent**	**1,000s**	**percent**	**1,000s**	**Percent**	**% with low food security**
All households	124,044	106,618	86	17,426	14	10,488	8.4	6,938	5.6	60.2%
Household composition:										
With children < 18 yrs	39,079	31,590	80.8	7,489	19.2	5,147	13.2	2,342	6	68.7%
With children < 6 yrs	17,211	13,786	80.1	3,425	19.9	2,457	14.3	968	5.6	71.7%
Married-couple families	25,376	22,226	87.6	3,150	12.4	2,346	9.2	804	3.2	74.5%
Female head, no spouse	9,912	6,411	64.7	3,501	35.3	2,230	22.5	1,271	12.8	63.7%
Male head, no spouse	3,237	2,533	78.3	704	21.7	476	14.7	228	7	67.6%
Other household with child	554	419	75.6	135	24.4	96	17.3	39	7	71.1%
With no children < 18 yrs	84,965	75,029	88.3	9,936	11.7	5,340	6.3	4,596	5.4	**53.7%**
More than one adult	50,621	45,731	90.3	4,890	9.7	2,772	5.5	2,118	4.2	**56.7%**
Women living alone	19,062	16,149	84.7	2,913	15.3	1,541	8.1	1,372	7.2	**52.9%**
Men living alone	15,283	13,150	86	2,133	14	1,027	6.7	1,106	7.2	**48.1%**
With elderly	34,269	31,230	91.1	3,039	8.9	1,941	5.7	1,098	3.2	63.9%
Elderly living alone	12,792	11,608	90.7	1,184	9.3	704	5.5	480	3.8	59.5%
Race/ethnicity of households:										
White, non-Hispanic	84,127	75,335	89.5	8,792	10.5	4,966	5.9	3,826	4.5	**56.5%**
Black, non-Hispanic	15,424	11,393	73.9	4,031	26.1	2,434	15.8	1,597	10.4	60.4%

Hispanic	16,148	12,527	77.6	3,621	22.4	2,502	15.5	1,119	6.9	69.1%
Other, non-Hispanic	8,346	7,365	88.2	981	11.8	585	7	396	4.7	59.6%
Household income-to-poverty ratio:										
Under 1.00	15,812	9,560	60.5	6,252	39.5	3,409	21.6	2,843	18	**54.5%**
Under 1.30	20,783	13,009	62.6	7,774	37.4	4,290	20.6	3,484	16.8	**55.2%**
Under 1.85	31,376	20,790	66.3	10,586	33.7	6,030	19.2	4,556	14.5	**57.0%**
1.85 and over	64,200	60,153	93.7	4,047	6.3	2,683	4.2	1,364	2.1	66.3%
Income unknown	28,468	25,676	90.2	2,792	9.8	1,775	6.2	1,017	3.6	63.6%
Area of residence:4										
Inside metropolitan area	104,931	90,781	86.5	14,150	13.5	8,601	8.2	5,549	5.3	60.8%
In principal cities5	35,672	30,085	84.3	5,587	15.7	3,476	9.7	2,111	5.9	62.2%
Not in principal cities	51,892	45,779	88.2	6,113	11.8	3,600	6.9	2,513	4.8	**58.9%**
Outside metropolitan area	19,114	15,839	82.9	3,275	17.1	1,886	9.9	1,389	7.3	**57.6%**
Census geographic region:										
Northeast	22,156	19,209	86.7	2,947	13.3	1,789	8.1	1,158	5.2	60.7%
Midwest	27,260	23,489	86.2	3,771	13.8	2,180	8	1,591	5.8	**57.8%**
South	46,869	39,803	84.9	7,066	15.1	4,235	9	2,831	6	59.9%
West	27,760	24,119	86.9	3,641	13.1	2,284	8.2	1,357	4.9	62.7%
Source: http://www.ers.usda.gov/media/1896841/err194.pdf.										

Source: http://www.ers.usda.gov/media/1896841/err194.pdf

Endnotes

[1] Several caveats are in order: (1) This report is not able to adjust for the fact that several states have minimum wages that exceed the federal, and (2) it assumes the parameter estimates are the same across states. The first implies that this report's estimates may be too large.

[2] "Food Security in the U.S," United States Department of Agriculture Economic Research Service, September 8, 2015, http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/measurement.aspx#hunger.

[3] The technique has been used to evaluate the impact of unionization, anti-discrimination laws, social assistance programs, limits on unemployment insurance benefits, and the impact of financial aid offers on college enrollment decisions. Within the education literature, the RD approach researchers have used the approach to estimate the impact of class size reduction, remedial education, delayed entry to kindergarten, and the impact of the Reading First program on instructional practice and student achievement.

[4] There is an ongoing debate as to whether the model should include time effects that vary by Census division and state-specific linear time trends.

[5] An earlier version of this report limited the sample to households with hourly earnings. Possessing information on industry and occupation of employment were also added as screens. The impact of this restriction is that the samples are reduced because hourly wages are only collected for the outgoing rotation groups (4 and 8), which represent 20 percent of the CPS sample. Further, in 1998 and 1999, a food security test question was used in rotation group 8, leading to households with multiple children or adults being excluded during the computation of food security status. The Bureau of Census and Bureau of Labor Statistics adjust the sample weights of the remaining rotation groups to account for the sample's reduction. This report also excludes households in which the reference person's (head of household) hourly wages are below $1.00 per hour. If the individual receives tips, overtime pay or commissions then hourly wages is the ratio of weekly earnings and usual hours worked per week. During the 2007, 2008, and 2009 increases, many states increased their own minimum wages. In each year, 30, 33, and 27 states, respectively, had minimum wages that exceeded the federal minimum wage. However, in 2010 and 2011, only 15 and 17 states had minimum wages that exceeded the federal minimum wage.

[6] Note that Table 58 presents employment results because although this is CPS data, which many studies use, it is the first study that uses the Food Security Supplement. This is important because the supplements come from a variety of months: April (1995, 1997, and 1999), September (1996, 2000), August (1998), and December for the 2001 to 2011.

[7] The findings of other studies support this disaggregation. See Mark Nord Heather Hopwood, "Recent Advances Provide Improved Tools for Measuring Children's Food Security," *Journal of Nutrition* 137, no. 3 (2007): 533–36 and Jayanta Bhattacharya, Janet Currie, and Steven Haider, "Poverty, Food Insecurity, and Nutritional Outcomes in Children and Adults," *Journal of Health Economics* 23, no. 4 (2004): 839–62.

[8] Nine of the Food Security questions are coded as a "yes" or a "no." The other nine questions have three outcomes. Six of the nine food security questions ask respondents whether the statement was "often true," "sometimes true," or "never true" for them or other household members, allowing me to model them as an ordered probit. For these questions, I create a categorical variable that equals 0 if the respondent answers "never true," 1 if "sometimes true," and 2 if "often true." Three questions ask respondents whether a particular food situation occurs "Only One or Two Months," "Some Months, but not Every Month," or "Almost Every Month." A similar categorical variable that ranges from 0 to 2 is constructed. Ordered probit models are estimated for each question. In the documentation, these variables are hesh2, hesh3, hesh4, hesh5, hessh1, hessh2, hessh4, hessh3, and hessh5.

[9] This report's results differ from those in Joseph J. Sabia and Robert Nielsen, "The Effect of Minimum Wages on Material Hardship: Evidence from the SIPP," *Review of Economics of the Household* (2012). They find that an increase in the minimum wage has no impact on food security, while this report finds a positive impact. The evidence presented in this report is more consistent with those found in Heflin (2009) and McCarrier et.al. (2011). These studies find evidence that increases in the minimum wage reduce material hardship. Why do the results in this report differ from those in Sabia and Nielson? First, this report uses the CPS's twelve-month food security measure, while they use a SIPP four-month measure. Second, depending on the household's composition, they use two to five questions to develop their food insecurity measure, not even half of the CPS Food Security Supplement's eighteen questions. Their food insecurity measure is constructed as follows. SIPP respondents are first asked whether it was "often true, sometimes true, or never true" that "The food that (I/we) bought just didn't last and (I/we) didn't have money to get more. (I/we) couldn't afford to eat balanced meals." These are questions (2) and (3) in Table 58 panel 'a' of this report. Depending on the responses to these questions and the household's composition, respondents were asked one or more of the following questions to measure both adult and childhood insecurity. "My child was/our child was/the children were not eating enough because (I/we) couldn't afford enough food," "In the past four months did you or the other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food?" "In the past four months did you or the other adults in the household ever eat less than you felt you should because there wasn't enough money to buy food?" The first two questions correspond to questions 6 and 7 in Table 58 panel a. The last question is a variant of questions 8 and 9 in Table 58 panel a. Sabia and Nielson create a food insecurity dummy variable that equals 1 if the respondent said that these questions occurred "often" or "sometimes," and 0 if they never are true. Sabia and Nielson use two of the food security questions that have the greatest incidence, but they model food security as a binary outcome. This report first demonstrates the need to model food security as an ordered probit that allows for a distinction between "Very Low" and "Low Security" households and households where the statements are "often true" and "sometimes true." Their minimum wage variable is the natural log of the higher of the state or federal minimum wage. They include time-invariant state effects and state-invariant time effects. This means that the identification of the log minimum wage variable comes from within-state variation in the minimum wage. This report also includes this variable, but in the Regression Discontinuity Framework, the log minimum wage variable controls for selection bias, while the coefficient on the dummy variable that measures whether the state's minimum wage exceeds the federal provides identification of the minimum wage's impact on food security. Sabia and Nielson also face limitations with the SIPP food security sample. The food insecurity information is only available for three years: 1998, 2003 and 2005. This reduces their sample by 72 percent from 464 to 128 observations. During these three years, eleven states changed their minimum wages. This report uses food security information in every year from 1996 to 2011, providing well over twenty-nine states that increased their minimum wages to levels that exceeded the prevailing federal minimum wage. Plus, the models used for this report estimate at the person level, providing over a million observations.

[10] Several caveats are in order: (1) This report is not able to adjust for the fact that several states have minimum wages that exceed the federal, and (2) it assumes the parameter estimates are the same across states. The first implies that this report's estimates may be too large.

[11] The model does not take into account the possible loss of food stamps and tax credits for families with children as the minimum wage increases. Thus, these estimates represent potential upper bounds.

[12] First, take 20 percent of earned income. Second, subtract the standard deduction $155 for households with sizes of 1 to 3 people and $168 for a household size of 4 (higher for some larger households) Third, subtract a dependent care deduction for work, training, or education. Third, subtract medical costs over $35 for elderly and disabled. Fourth, subtract the excess shelter deduction. This is adjusted income. The next step is to divide it by two. Fifth, determine if a household's shelter costs are more than half of their adjusted income. Sixth, subtract the excess amount, but not more than the limit, from adjusted income. This is net household income.

Excess shelter costs are more than half of the household's income after the other deductions. Allowable costs include the cost of fuel to heat and cook with, electricity, water, the basic fee for one telephone, rent or mortgage payments and taxes on the home. (Some States allow a set amount for utility costs instead of actual costs.) The amount of the shelter deduction cannot be more than $504 unless one person in the household is elderly or disabled.

[13] The income calculations are made based on the following formulas: Monthly income is calculated by dividing the annual income by 12; twice monthly income is computed by dividing annual income by 24; income received every

two weeks is calculated by dividing annual income by 26; and weekly income is computed by dividing annual income by 52. All numbers are rounded upward to the next whole dollar

For greater detail, see, https://www.federalregister.gov/articles/2016/03/23/2016-06463/child-nutrition-programs-income-eligibility-guidelines.

[14]For additional information, see http://www.fns.usda.gov/tefap/eligibility-and-how-apply.