

Early Evidence on the Impact of Seattle’s Minimum Wage Ordinance

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Abstract

This paper provides an overview of Seattle’s 2014 ordinance mandating a gradual increase to a \$15 minimum wage. It then outlines a research agenda for a comprehensive evaluation of the effects of this ordinance, to be executed concurrently with the phase-in period. The evaluation is using original data on area prices, and on employer and worker perspectives, as well as secondary survey and state administrative data. This paper presents results from a series of investigations of consumer prices, including intensive field collection from grocery stores and small businesses. Most investigations use difference-in-difference methodology comparing trends in Seattle to those in nearby jurisdictions. Results show no statistically significant impact of Seattle’s initial increase to an \$11 minimum wage on consumer prices, though estimates are imprecise enough to be consistent with the small positive effects observed in other studies and suggestive of a more concentrated impact in the restaurant industry.

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1. Introduction

In an economic environment marked by rising income inequality and stagnant poverty rates, voters and legislators in several states and large cities have supported initiatives to increase the minimum wage. These initiatives are intended to improve the well-being of low income workers and families, but there is much debate and concern about whether such outcomes can be realized. The evidence base regarding the impact of the minimum wage on outcomes of interest is substantial, but contentious and—particularly for local minimum wages—incomplete.

One significant limitation of the existing minimum wage literature is its tendency to focus on estimating what might be described as average treatment effects. As the minimum wage is in the nature of a redistributive policy, average treatment effects are insufficient, and may even be unnecessary, in the determination of whether it achieves its proponents' goals. The minimum wage may be desirable even in the presence of negative average treatment effects, if benefits are concentrated on disadvantaged households and costs are largely born by those who can afford them. The inverse is also true.

Average treatment effects obscure more than the distribution of gains and losses. They also obscure potential contextual determinants of treatment effects. The minimum wage may be a more beneficial policy in certain circumstances.

The minimum wage literature has focused significant attention on basic measures of employment and earnings (Neumark and Wascher 1992; Card and Krueger 1994; Neumark and Wascher 2000; Card and Krueger 2000; Neumark and Wascher 2008; Dube et al. 2010; Allegretto et al. 2011; Neumark, Salas and Wascher 2014; Meer and West 2015), and a more

modest amount of attention on distributional indicators such as household poverty and means-tested benefit receipt (Card and Krueger 1995; Neumark, Schweitzer and Wascher 2005; Burkhauser and Sabia 2007; Sabia 2008; Dube 2013; West and Reich 2014). These studies do not establish a consensus and leave open the possibility that the effects of the minimum wage vary according to certain contextual factors. Studies have generally not focused on more fundamental indicators of family or household-level well-being.

This paper describes a multidisciplinary, mixed-methods approach to evaluating the potentially heterogeneous impacts of the minimum wage on a range of market, household, and firm-level outcomes. The approach will be undertaken by a team of researchers from the University of Washington to evaluate the Seattle minimum wage ordinance, passed in 2014, which will raise the minimum wage in that city to \$15 as soon as January 2017. The same group will apply elements of this method to study minimum wage increases in Chicago and a range of U.S. states.

Beyond describing the methodological approach, this paper presents the earliest findings from the analysis, pertaining to price data collected in person by study personnel. Results, derived from repeated price collection in a range of retail outlets including grocery stores, drugstores, and small businesses, show no significant impact of the minimum wage ordinance on price levels, though estimates are imprecise enough to be consistent with small increases on the order of 1%. These early results are offered with the significant caveat that they may not adequately describe firm responses to the minimum wage in the long run, and pertain only to the initial Seattle increase from \$9.47 to \$11 on April 1, 2015.

2. Seattle's minimum wage ordinance

In June 2014, the City of Seattle passed an ordinance mandating a \$15 minimum wage, to be phased in starting in April 2015. The minimum wage increased to \$11 at the beginning of the phase-in period, from the state-level minimum of \$9.47. In coming years the implementation schedule will vary according to firm size and whether a worker receives an employer contribution toward health insurance benefits. The City will maintain a subminimum wage for tipped workers in small firms during the phase-in period but will phase the credit out by 2021. Table 1 describes the minimum wage phase-in schedule as a function of employer size, benefit offerings, and eligibility for tips.²

Seattle's minimum wage will affect the employment conditions of a large number of workers. An analysis performed for the City prior to the passage of the law found that nearly one-quarter of Seattle workers, including more than 100,000 persons, earned less than \$15 per hour (Klawitter, Long, and Plotnick, 2014). The City's action may affect thousands of additional workers indirectly, including those earning slightly more than the mandated minimum and those employed in nearby jurisdictions.

Seattle's minimum wage has courted controversy along several lines. Although an unprecedented action for a large city, labor activists had been advocating for a more rapid implementation, up to and including an instantaneous raise to \$15. Exactly such an increase had been implemented in the small community of SeaTac, Washington at the beginning of

² Workers under the age of 16 may be paid a subminimum wage equal to 85% of the applicable minimum. Employers may also apply for authorization to pay wages below the City minimum, but above the state minimum, for learners, apprentices, messengers, or individuals with disabilities.

2014. While many small communities might worry that raising local wages would push jobs outside the city limits, substantial portion of economic activity in SeaTac is tied to the major international airport serving Seattle and Tacoma, which cannot move.

The Seattle minimum wage also prompted legal action on the part of franchise operators in the city. The ordinance classifies employers by size and mandates a more rapid phase-in schedule for large employers. Franchise operators are instructed to classify the size of their business according to the total number of employees at same-branded franchises nationwide. A request for an injunction against this provision was denied in court.

3. Research Agenda for the Minimum Wage Study

In December 2014, the City of Seattle entered a contract with the University of Washington to conduct a mixed-methods evaluation of the minimum wage ordinance's impact on a range of labor market, household, and firm-level outcomes. Since that time, the UW research project has expanded in scope to evaluate the impact of the minimum wage on additional outcomes and in other locations, including Chicago and a series of states that implemented increases in the period between 2006 and 2008.

3.1 Administrative Data Analysis

Previous analyses of the minimum wage have focused on core labor market outcomes including employment and earnings. The UW study will evaluate the impact of the Seattle minimum wage ordinance on these outcomes using records collected by the Washington Employment Security Department (ESD), which administers the unemployment insurance

program. The ESD, charged with determining eligibility for unemployment benefits, maintains quarterly records of employment and earnings for workers identified by name and social security number. Beyond these basic measures required to determine benefit eligibility, Washington is one of a small number of states that collects hours worked data at the level of the individual employee. It is thus possible to impute average hourly wages for workers in the ESD data, and thereby to identify low wage workers more reliably than in comparable data sources in other states. It is also possible to determine the impact of the minimum wage on hours worked, both at the individual employee level and aggregated to an establishment level.

Records from ESD can be cross-referenced with other databases maintained by Washington state agencies. Of particular interest for this study, Washington's Department of Social and Health Services (DSHS) maintains an Integrated Client Database with information on families receiving means-tested benefits including SNAP and Medicaid. This will permit us to focus attention on low-wage workers who belong to low-income households, and to examine the effects of higher minimum wages on means-tested program participation and benefits.

Identification of causal effects will make use of variations on the basic differences-in-differences model. Seattle and other "treated" regions will be compared to multiple types of "control" regions, ranging from immediately adjacent geographic areas to more distant metro areas selected using a synthetic control method that effectively matches on pre-treatment characteristics and trends. The difference-in-difference method applies most clearly to studies of outcomes at the firm or labor market area. The analysis of worker or household-level outcomes is complicated by the fact that workers may cross boundaries between treatment and control regions. Basic analyses will compare the trajectories of workers employed in

different regions at baseline, but further analyses will be necessary to incorporate the experiences of new labor market entrants or households with employment both inside and outside the treated region.

3.2 Employer Survey

Administrative data capture employment, hours, and earnings but do not record other aspects of employment including fringe benefits and scheduling. To gain more insight into the possible impacts of the minimum wage on these aspects of employment and other employer responses, we developed a survey instrument to capture some covariates and outcomes in the Seattle and Chicago metro areas.

In early 2015, we screened over 3,000 Seattle businesses to identify those employing low-wage workers (under \$15/hour). This survey utilized a stratified random sample oversampling certain categories of business including childcare providers. Of those with low-wage workers, 675 (61% of those eligible) responded to our survey. We are able to track non-respondents through administrative records and plan to employ sampling weights to address concerns of selection into the survey sample. Survey respondents completed the survey instrument either by phone or online, primarily in the months of March and April. As the first increase in the minimum wage took place on April 1, the baseline survey was not intended to capture business responses, but rather business expectations regarding the impact of the minimum wage. A follow-up survey to assess the actual impact of minimum wage increases is scheduled for early 2017, by which time large employers will be paying the full \$15 minimum wage to workers not receiving health insurance benefits.

The baseline survey collected the following information from respondents:

- **Firm characteristics:** for-profit versus non-profit status, franchise, family-owned, woman-owned, minority-owned, immigrant-owned, number of locations (total, regional, and Seattle), age, plans for relocation
- **Workforce:** number of employees (total and Seattle), employee statuses (full-time, part-time, temporary, seasonal, occasional basis Seattle workers), contract workers, tipped workers, commissioned workers, union/non-union, interns, turnover in past year, employee demographics (gender, age, race/ethnicity;
- **Compensation:** earnings levels (focus on wages below or at \$15/hour), benefits offered (including health insurance)
- **Human resources issues:** challenges finding, training and retaining workers
- **Most common low-wage job category:** hourly wages, tip amounts (if any), benefits, health insurance use
- **Most popular product/menu item/service unit:** cost per item, recent cost changes
- **Overall business:** total sales/revenue, recent sales/revenue trends, total costs, recent cost trends
- **Minimum wage requirement:** awareness, challenges associated with implementing, planned or in-progress business changes, anticipated results

In the upcoming months we will be surveying businesses and nonprofits in King, Snohomish, and Pierce Counties to serve as a “control” region for Seattle.

3.3 In-depth Worker Interviews

Most prior research on the minimum wage uses natural experiments to estimate the causal impacts of the policy on employment, earnings, and income. Notwithstanding the rigor and importance of these studies, they are not designed to examine the full range of effects that the policy could have on family life, to uncover the mechanisms by which the policy “trickles down” to affect workers, or to capture workers’ subjective experience and process.

To both broaden and deepen our understanding of the policy’s effects, we designed a longitudinal, qualitative study of 53 low-wage workers in Seattle with custodial children. We know of no prior qualitative studies of workers and their families during a minimum wage increase, but there is a long tradition of using qualitative methods to study low-wage work, and to uncover the process and meaning of program or policy impacts on low-income families (e.g. Darrah & DeLuca, 2014; Edin & Lein, 1997; Duncan, Huston, & Weisner, 2007; Newman, 1999; Seefeldt, 2008; Tach & Halpern-Meehin, 2014). For example, qualitative interview data collected from participants in an experimental housing mobility program in Baltimore helped reveal the process by which the program changed families’ preferences for certain neighborhoods (Darrah & DeLuca, 2014).

Qualitative interviewing techniques, while not designed to produce generalizable or causal estimates, are unmatched in their ability to describe processes of change, to reveal the complex ways in which individuals and families react to and shape their own economic circumstances, and to provide an authentic voice for the subjects of research. In the context of the comprehensive evaluation of the City of Seattle minimum wage, the qualitative study of workers is designed to provide deep and longitudinal documentation of the subjective

experiences of low-wage workers during this period of policy change. We have four research questions:

1. How do workers experience the wage increases in their monthly budgets, and through what mechanisms?
2. From the perspective of workers, how are their work schedules, compensation, and tasks determined? Are these job attributes changing as the wage mandate takes effect? If so, how do workers perceive these changes as being related to the minimum wage increases, if at all?
3. What are the trade-offs, according to workers, of packaging earnings with other financial and in-kind supports? Do these trade-offs change for the workers during the implementation of the law?
4. How do workers describe the influence of work conditions and budgets on day-to-day routines, family dynamics (including parenting), and parent and child well-being?

We recruited volunteers to the qualitative study of workers with the goal of creating a diverse sample, particularly by marital and immigrant status. Recruitment activities included passing out flyers and advertising the study at Seattle area social service agencies, public transit stops, libraries, and restaurants. We defined the eligible population as adults working in a job located in the City of Seattle for less than \$15 per hour; with custodial children; and with annual family income of less than \$50,000. We conducted Wave 1 interviews between February 2015 and November 2015, with the majority of interviews occurring between February and April 2015. Wave 2 interviews are scheduled for February 2016 to April 2016. Between the yearly in-

depth interviews, we are conducting short follow-up phone calls approximately every other month, both to maintain contact with the sample and to collect updated data.

The interviews were conducted at participants' homes, or another location of their choice. Interviews were conducted in either English or Spanish, or in English with live translation to Cantonese, Vietnamese, or Somali. Interviews lasted 60-90 minutes, on average, and were audio recorded. The interviews were semi-structured, guided by a set of open-ended questions about work conditions, family budgets, and family life, and by lists of suggested probes for the interviewers. The interviewers were trained to keep the interviews conversational and to give the participant a role in guiding the course of the conversation. Interview tapes were then transcribed, cleaned of identifying information, and uploaded to the data software, Dedoose, for coding and initial analysis. The research team used an iterative process of team coding to construct a codebook for the interview data. Each transcript was then coded by one team member and reviewed by another. Throughout the coding process, we met weekly to discuss any questions or concerns about the codebook. The team has also produced one-page summaries of each case.

The respondents' filled out a demographic survey at the end of the wave 1 interview, providing information on race/ethnicity, nativity, age, wage, number of people in the household, and other characteristics. Table 1 shows the demographic composition of the worker sample and compares those sample characteristics to population estimates of an "eligible" population in the city of Seattle (using the American Community Survey). The sample was not designed to be statistically representative of low-wage workers in Seattle with children, but it nonetheless represents the diversity of individual and job characteristics quite well.

Compared to estimates for less-educated Seattle workers with children and low-incomes, our sample is somewhat more likely to be female, unmarried, and to work for a non-profit organization. The percentage foreign born (58 percent) is not dissimilar to the eligible population, but our sample has a lower proportion of Asian and a higher proportion of African individuals.

3.4 Price data

For the minimum wage study, grocery store prices were assessed using a custom-designed market basket of 106 foods developed by the University of Washington Center for Public Health Nutrition (CPHN) and implemented in past studies (Mahmud et. al, 2009; Drewnowski et. al, 2012). This market basket is based on the Consumer Price Index and the Thrifty Food Plan Market Baskets and queried foods are a part of the Behavioral Risk Factor Surveillance System (BRFSS). The modified market basket collects price information on both an assortment of commonly eaten foods, as well as nutrient-rich foods suitable for a healthy diet.

The Market Basket project focuses only on foodstuffs. Our project supplemented the grocery data with a variety of price data collection activities. As noted above, the employer survey asked each of 675 businesses to identify the price of their most commonly sold good or service. Employers will be asked to update the price data in future survey waves. Study personnel have also conducted in-person price data collection at a range of retail outlets, including drug stores, large national retail chains, and small businesses. These in-person efforts have been complemented with internet-based price harvesting.

3.5 Expansion beyond Seattle

The minimum wage study is in the process of expanding its efforts to analyze the impact of Chicago's municipal minimum wage increase as well as state-level minimum wage increases occurring in the 2006-2008 time frame. These expansions focus on two elements of the Seattle study: administrative data analysis and employer surveys.

Administrative data analysis in other location is projected to utilize the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) data, which aggregate UI records across most of the state agencies charged with collecting them. The LEHD data permit the study of employment and earnings at the worker level, but do not reliably track hours worked as in Washington state. The UW research team plans to develop a predictive algorithm to identify low wage workers in the LEHD, on the basis of earnings, industry, and potentially other firm-level characteristics. The LEHD data will be analyzed using difference-in-difference methods similar to those anticipated in Seattle.

The Seattle employer survey has been modified for use in alternate locations. Subject recruitment in the Chicago metro area commenced in fall 2015. Follow-up waves of the Chicago survey are scheduled to occur in 2017.

4. Initial impacts on prices: Methodology

4.1 Grocery stores

The Market Basket project sends personnel to grocery stores in order to collect price information on a basket of 106 commonly eaten foods. Surveyors are instructed to record the price of the lowest cost version for each item, and to focus on "medium" sizes when products are differentiated along that dimension. Example items include a half-gallon of 2% milk,

bananas, one dozen eggs, and 16 ounce jars of creamy peanut butter. By design, the market basket tends to capture foods commonly eaten by lower-socioeconomic status households.

For the minimum wage study, the Market Basket protocol was used in six grocery chains, with each chain represented by one store inside Seattle and one store outside of Seattle but within King County. These six chains account for over two-thirds of all grocery purchases in King County. Individual stores were selected based on the locations of lower income neighborhoods as these neighborhoods may be more likely to have individuals earning the minimum wage. Past local area studies have linked these neighborhoods to lower socioeconomic status, worse diet quality, and worse health outcomes (Drewnowski et. al in press, Jiao et. al 2012, Drewnowski et. al 2014a, Drewnowski et. al 2014b). The chains represent four unionized chains (Fred Meyer, Safeway, Albertson's, and QFC) and two non-unionized chains (Grocery Outlet, Whole Foods). A baseline survey wave was conducted in March 2015, and a second in May 2015.

Analysis of the grocery data utilizes simple difference-in-difference methods.

4.2 Other retail

In addition to the grocery price collection and price data collected via the employer survey, we completed two additional ground-level price collection activities. First, we compiled a basket of non-food household necessities, such as over-the-counter medication, clothing, and kitchenware, for a typical low income family. We collected the prices of those goods at stores in Seattle and in the neighboring community of Tukwila one month before the minimum wage

increase and each month thereafter for six months.³ Second, we cluster-sampled prices at small businesses in two Seattle neighborhoods. One, Wallingford, is a densely populated affluent neighborhood in North Seattle; the second, Rainier, is a lower-income neighborhood in South Seattle with a large immigrant population. Prices were collected door-to-door, focusing on the price of each store's most popular or basic good.⁴ One-fifth of the businesses sampled were either limited or full service restaurants; restaurant data were collected almost exclusively in Seattle.

These in-person data collection efforts were supplemented with the repeated harvesting of 283 prices from 34 restaurants in the greater Seattle area from the website GrubHub.com. The first wave of data collection occurred within a week of the first Seattle minimum wage increase, in early April 2015. Our second wave, nine months later, occurred a month after the second wage increase, in late January 2016. Minimal attrition occurred; the second wave of price collection only lost 13 individual menu items. With both the web harvesting and small-business price collection efforts, we made no effort to ascertain whether the goods sold were of equal size or quality, except in those situations where the posted price list specified a size (for example, a 12 oz. cup of coffee). This caveat should guide interpretation of our results below.

³ In later months a bar code scanner was employed to ensure the comparison of identical goods over time.

⁴ For example, in coffee shops we looked at the price of an 8 oz. drip coffee, in pizzerias we looked at the price of one slice of plain pizza, etc. If there was no obvious reference item, an employee was asked for the price of the store's most popular item.

Once the data were collected, items without a base price collected before the minimum wage increase was implemented were removed.⁵ Items from businesses that closed between March and October were also removed.⁶

In order to study the basic trends of prices in and outside Seattle from March to October of 2015, we first summarize the ratio of prices in each post-increase period relative to baseline:

$$Price\ Index_{jt} = \frac{\sum_{i=1}^n \frac{p_{ijt}}{p_{ij0}}}{n}$$

where the price p for good i at time t in jurisdiction j is compared to the price for the same good in the baseline period (March, or April in the case of the grubhub.com prices). By construction, this weights all goods equally in the index.

To further analyze the price data, we estimate regression models in which the dependent variable is a price ratio analogous to that used in the computation of the index above.

Our basic regression is then:

$$\frac{P_{it}}{P_{i0}} = \alpha_t + \beta_t Seattle_i + \epsilon_{it}$$

where the variable $Seattle_i$ indicates whether the price in question was collected in Seattle. A modification of this regression takes into account potential differences in the effect of the

⁵ In some cases goods were discontinued or stores were closed and replaced by others.

⁶ In future research, the rate of closures inside and outside Seattle will be compared to other years using administrative data.

minimum wage by month given that it came from a business in Seattle. In some cases the time-varying slope coefficient will be constrained to a single value across all months. In additional specifications we introduce an indicator for whether the prices in question were collected in the door-to-door cluster sample. We also report results of specifications that exclude these observations entirely, as the door-to-door method was not employed outside the City of Seattle until after the sample period utilized here.

5. Initial impacts on prices: Results

Table 3 presents a basic difference-in-difference analysis of grocery price data derived from the Market Basket project. As shown, grocery outlets in the City of Seattle had slightly higher prices at baseline. The entire basket of 106 goods had an average cost of \$316.85 in the City as of March, compared to \$314.09 elsewhere in King County. Four of the six matched pairs had higher prices in Seattle. This amounts to a net price differential of under 1%.

The second row of Table 3, derived from data collected in May 2015, shows virtually no change in the net cost of the market basket. Both inside and outside the city, the total market basket price has declined very slightly, at a magnitude consistent with seasonal price decreases for fresh produce. If anything, the price decline is more rapid in Seattle relative to its surroundings. The difference-in-difference estimate for the change in the average cost of the market basket is -0.70.

Table 4 uses regression analysis, with the unit of observation a single price, to provide some sense of the precision of the estimate. The difference-in-difference point estimate of -0.007 suggests that the item-level price response to the minimum wage increase was less than

a penny; the baseline mean price is approximately \$3. The standard error of the estimate is 19 cents. As such, while the point estimate is indistinguishable from zero we are similarly unable to reject the hypothesis of mean minimum wage-induced price increases of up to 36 cents, or just over 1% of the baseline price. We can reject any hypothesis involving a price increase above this magnitude.

Table 5 shows summary normalized price statistics from ground-level price collection outside of grocery stores between March and October 2015. Prices for individual items are normalized to one in the baseline period. We show the average price increase after March, from all businesses and specifically from restaurants. The table shows that prices have ticked slightly upwards both in Seattle and in surrounding areas since the baseline period. By October, the average Seattle good cost 2.3% more than it had in March. In the surrounding area, by contrast, the average increase was slightly greater, mirroring the finding in the Market Basket study. Except in the first post-minimum wage increase period, simple difference-in-difference methods suggest more rapid price increases outside Seattle. In April, Seattle prices held steady while prices outside Seattle declined by just over 2%. Prices collected from limited and full service restaurants inside Seattle increased by an average of 7.7% after the baseline month. This suggests a concentration of price effects in the restaurant industry – in fact street prices collected from Seattle businesses other than restaurants showed no average change during the period of study.

Table 6 focuses more squarely on the restaurant industry by summarizing price data collected from GrubHub.com. Prices collected within the City of Seattle were on average 3.6% higher in January 2016 than they were in April 2015. This point estimate is smaller than the

street price statistic, but it also reflects a baseline measure that post-dates the first increase in the Seattle minimum wage. Street price data suggest an average 4.4% increase in restaurant prices from March to April 2015 alone, which if added to the 3.6% estimate here yield a combined estimate very similar to the 7.7% increase in the street data.

While the GrubHub and street price data show some consistency with regard to restaurant price increases in Seattle, they also suggest that the observed restaurant price increases were not due solely to the minimum wage. In restaurants outside of the city, the average April-to-January price increase was 3.1%, only slightly lower than the Seattle price differential over the same period. The difference in price ratios between Seattle and environs is not statistically significant. This could be interpreted as evidence of spillover effects – higher wages in Seattle forcing competitors in nearby areas to raise wages – or of extraneous factors such as higher rents causing the price increases. We are ultimately unable to distinguish these competing explanations and summarize the results by saying they are suggestive of concentrated price effects in the restaurant industry.

Table 7 presents regression results to establish the precision of our results. The most basic difference-in-difference estimates yield a negative point estimate not distinguishable from zero. The standard error estimate of 0.011 indicates that we are unable to reject the hypothesis of a small positive price response up to around 1% of the baseline price.

The basic regression includes data collected from a variety of businesses, including a sample of small businesses in Seattle only. The second reported specification excludes these data points with no “control” analogue, revealing another negative, insignificant point estimate with a standard error large enough to produce a confidence interval extending slightly above

0.01. The month-by-month estimates presented in the final specification are uniformly insignificant, estimated less precisely than those in the first specification.

On the basis of all the evidence collected, then, any price increase brought about by Seattle's increase to a \$11 minimum wage on April 1, 2015 led to at most small positive effects on prices, not detectable even in our largest samples. The preponderance of point estimates suggest an opposite-signed effect, though none of these estimates significantly differ from zero. The exception to this pattern is the restaurant industry, where prices appear to be roughly 8% higher than they were before the minimum wage increase, although it is unclear whether this increase can be fully or even partially attributed to the minimum wage itself.

It should be noted that our baseline price data collection in March may be close enough to the April 1 minimum wage increase that it already incorporates anticipatory responses to a policy change that had been announced several months before. Our price data collection efforts are ongoing, which will permit additional opportunities to examine effects associated with minimum wage increases on January 1, 2016 and January 1, 2017.

6. Conclusion

This study has described the Seattle minimum wage increase and plans to evaluate it as it is phased in over the next several years. The vast majority of this analysis is yet to come; employers filed the first post-increase quarterly employment and earnings reports in July 2015 and these data will become available to us in early 2016. The study team is under contract to produce an initial impact study for the City of Seattle in mid-2016.

As effects of the minimum wage may only be felt after a time lag, owing to delays in business adaptation involving capital investment, and also to the stepped nature of the increase to \$15 in Seattle, we have little reason to think that our initial impact assessment will adequately capture the full impact of the minimum wage ordinance. As some employers will have until 2021 to fully adapt to higher wages, the complete impact of the \$15 minimum wage in Seattle may not be known for nearly a decade.

Understanding the impact of a minimum wage increase in Seattle may also provide little insight as to the prospective impact of comparable wage increases in other economic contexts. Seattle is an affluent city, with one of the lowest poverty rates of any large metropolis. After Seattle passed the minimum wage ordinance, calls to raise the wage were issued in cities ranging from St. Louis to Birmingham – regions bearing limited economic resemblance. The minimum wage study's efforts to apply comparable methods in a range of locations, from states to cities, aims to build an understanding of the contextual determinants of the minimum wage's impact.

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Table 1: Seattle minimum wage implementation schedule

Date	> 500 employees		≤500 employees	
	No medical benefits	Medical Benefits	Neither tips nor medical benefits	Tips or medical benefits
Baseline (2015 Q1)	\$9.47	\$9.47	\$9.47	\$9.47
April 1, 2015	\$11.00	\$11.00	\$11.00	\$10.00
January 1, 2016	\$13.00	\$12.50	\$12.00	\$10.50
January 1, 2017	\$15.00	\$13.50	\$13.00	\$11.00
January 1, 2018	*	\$15.00	\$14.00	\$11.50
January 1, 2019	*	*	\$15.00	\$12.00
January 1, 2020	*	*	*	\$13.50
January 1, 2021	*	*	*	\$15.00

*Once fully phased in, the minimum wage will be indexed to the CPI.

Employers qualify for the medical benefits exemption to the minimum wage only if the value of their contribution exceeds the wage differential on an hourly basis. Small employers qualify for the tip credit only if the value of tips reported to the IRS exceeds the wage differential on an hourly basis. The baseline minimum wage is the Washington state minimum.

Table 2. Demographic Characteristics of In-Depth Worker Interview Sample at Baseline

Characteristic	Sample Statistics (n=53)		Population Estimates: Eligible Seattle Workers ¹	
	Range	Mean or Percentage	Mean or Percentage	95% CI
Age	24-56 years	38.5	40.0	39.5-40.5
Gender				
Male		19%	39.8%	28.6-52.3
Female		81%	60.2%	47.7-71.4
Partner status				
Married		38%	67.6%	55.2-77.9
Married, living apart		4%	4.6%	1.4-13.4
Cohabiting		17%	27.8%	14.8-49.3
Single, living alone		42%		
Number of children (own)	1-8	2.1	1.9	1.8-1.9
Household Size	2-11	4.1	3.8	3.8-3.9
Age of youngest child	0-17 years	6.2	9.2	8.8-9.5
Nativity				
U.S. born		42%	30.7%	9.5-158.3
Foreign born		58%	69.3%	30.4-182.6
Race/ethnicity				
White, Non-Hispanic		11%	34.4%	23.8-46.8
Hispanic		13%	9.8%	4.2-33.6
African-American, Non-Hispanic		23%	31.9%	21.6-44.2
African		32%		
Asian		17%	30.2%	20.2-42.5
Other or Multiple		4%	0.8%	0.1-11.2
Work hours (last week)				
1-29		38%	11.6%	2.2-67.8
30-40		51%	66.0%	38-144.1
41+		6%	22.5%	8-78.1
0		6%	--	--
Type of work				
Retail/Sales		11%	10.7%	3.1-27.1
Nursing/Caregiver		23%	6.3%	1.6-23.4
Teacher or childcare provider		15%	2.5%	0.3-21.3
Non-profit service provider		8%	1.5%	0.2-10.3
Food service		17%	16.0%	11-67
Reception/Admin work		9%	6.1%	0.7-53.2
Cleaning/Janitorial		9%	13.6%	5.7-32.4
Other		8%	43.3%	--

Hourly wage	\$9.47- \$14.70	\$11.84	\$9.94	\$9.78-\$10.10
Household yearly income	\$5,760- \$46,795	\$20,416.04	\$29,029.48	\$28,557-\$29,501

Source: Sample characteristics from study of workers in Seattle during minimum wage implementation. City population estimates from the American Community Survey 2008-2012, 5-year sample. Accessed through IPUMS USA at <https://usa.ipums.org/usa/>. 95% confidence intervals provided by IPUMS USA for percentages; calculated by authors as the mean plus or minus $[s/\text{sq.rt.}(n) * 1.960]$ for the means.

Notes:

¹Estimates from the ACS 2008-2012, 5-year sample for individuals 19-64 (all working age adults). Eligible workers are those employed with an hourly wage of \$1-\$15, who have at least 1 child in their household and a family household income at or less than \$50,000/year.

Table 3: Total cost of market basket, averaged across 6 grocery stores

	City of Seattle	Other King County	Difference
March 2015 (baseline)	\$316.85	\$314.09	\$2.76
May 2015	\$315.08	\$313.02	\$2.06
Difference	-\$1.78	-\$1.07	\$0.70

Table 4: DD estimate of the impact of the Seattle minimum wage on grocery prices

Independent variable	Coefficient
Seattle	0.026 (0.133)
Post-minimum wage increase	-0.010 (0.133)
Seattle*Post	-0.007 (0.188)
N	2,520
R^2	<0.001

Note: Unit of observation is the price of an individual grocery. Post-wage increase prices were collected in May 2015; pre-wage increase prices in March 2015.

Table 5: Average normalized prices of non-grocery items collected in person, 2015

	Seattle	Not Seattle	Difference
<i>March</i>	1 0	1 0	0
<i>April</i>	1.000 (0.103)	0.977 (0.136)	0.023
<i>June</i>	1.006 (0.172)	1.017 (0.221)	-0.010
<i>July</i>	1.014 (0.200)	1.051 (0.302)	-0.037
<i>August</i>	1.016 (0.188)	1.052 (0.307)	-0.035
<i>September</i>	1.019 (0.215)	1.022 (0.303)	-0.003
<i>October</i>	1.023 (0.193)	1.036 (0.297)	-0.013
<hr/> <i>Average Post Increase (April through October)</i> <hr/>			
<i>All</i>	1.013 (0.181)	1.021 (0.255)	-0.008
<i>Restaurants</i>	1.077 (0.094)	*	*
Note: Standard deviations in parentheses. *Insufficient sample			

Table 6: Summary Statistics for grubhub.com, ratio of January 2016 to April 2015 prices

	Mean	95% confidence interval	
<i>Outside Seattle</i>	1.031 (0.020)	0.991	1.071
<i>Seattle</i>	1.036 (0.006)	1.024	1.049

Table 7: DD estimates of price impacts on non-grocery prices

Independent variable	Dependent variable: ratio of post price to baseline price		
Seattle	-0.010 (0.011)	-0.013 (0.014)	0.000 (0.029)
Seattle*April	---	---	0.023 (0.041)
Seattle*May	---	---	-0.010 (0.042)
Seattle*June	---	---	-0.037 (0.041)
Seattle*July	---	---	-0.035 (0.041)
Seattle*August	---	---	-0.003 (0.041)
Seattle*September	---	---	-0.013 (0.041)
Includes small business cluster sample	Yes	No	Yes
N	1,443	1,029	1,443
R^2	<.001	<.001	<.001

Note: standard errors in parentheses. All specifications include month fixed effects.



Figure 1: Map of King County showing locations of City of Seattle and City of SeaTac. Source: King County, Washington.