

# REPORT ON THE IMPACT OF SEATTLE'S MINIMUM WAGE ORDINANCE ON WAGES, WORKERS, JOBS, AND ESTABLISHMENTS THROUGH 2015

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## Executive Summary

This report presents the short-run effects of the Seattle Minimum Wage Ordinance on the Seattle labor market. The Seattle Minimum Wage study team at the University of Washington analyzed administrative records on employment, hours, and earnings from the Washington Employment Security Department to address two fundamental questions:

- 1) How has Seattle’s labor market performed since the City passed the Minimum Wage Ordinance, and particularly since the first wage increase phased in on April 1, 2015?
- 2) What are the short-run effects of the Minimum Wage Ordinance on Seattle’s labor market?

While quite similar at first glance, these two questions address very different issues and require very different methods to answer. The first question can be studied with a simple before/after comparison. Although the comparison is simple, it risks conflating the impact of the minimum wage with other local trends. Many things have happened in Seattle’s labor market since June 2014, most of them having little or nothing to do with the minimum wage itself. The City has enjoyed steady expansion in tech sector employment, and a construction boom fueled by rising residential and commercial property prices. Even the weather – a key determinant of economic activity in the Puget Sound region – was favorable in 2015, with record-low precipitation in the early months of the \$11 minimum wage. The before-after comparison can tell us the net impact of all these simultaneous trends, but this comparison cannot distinguish among them.

Our second question – the more important one for purposes of evaluating the policy – aims to isolate the impact of the minimum wage from all the other regional trends seen over the same time period. Whereas the first question asks “*are we better off than we were when Seattle raised the minimum wage*” and requires only a simple comparison of yesterday to today, the second asks “*are we better off than we would have been if Seattle had not adopted a higher minimum wage?*” To answer it requires imagining how the local economy would look in absence of a Minimum Wage Ordinance.

While it is impossible to directly observe what would have happened if no wage ordinance had been implemented, this report uses widely accepted statistical techniques to compare Seattle in its current state—with the presence of the Minimum Wage Ordinance—to an image of what Seattle might have looked like today if not for the Minimum Wage Ordinance. We take advantage of data going back to 2005 to build a model of the way Seattle’s labor market typically works. We also take advantage of data on nearby regions that did not increase the minimum wage to better understand how other factors might have influenced what we observe in the City itself.

In this report, we present findings on wages, workers, jobs, and establishments. Our findings can be summarized as follows:

Wages:

- The distribution of wages shifted as expected.
- The share of workers earning less than \$11 per hour declined sharply.
- This decline began shortly after the ordinance was passed.
- However, similar declines were seen outside of Seattle, suggesting an improving economy may be the cause of the change in the distribution of wages.

Low-Wage Workers:

- In the 18 months after the Seattle Minimum Wage Ordinance passed, the City of Seattle’s lowest-paid workers experienced a significant increase in wages.
  - The typical worker earning under \$11/hour in Seattle when the City Council voted to raise the minimum wage in June 2014 (“low-wage workers”) earned \$11.14 per hour by the end of 2015, an increase from \$9.96/hour at the time of passage.
  - The minimum wage contributed to this effect, but the strong economy did as well. We estimate that the minimum wage itself is responsible for a \$0.73/hour average increase for low-wage workers.
- In a region where all low-wage workers, including those in Seattle, have enjoyed access to more jobs and more hours, Seattle’s low-wage workers show some preliminary signs of lagging behind similar workers in comparison regions.
  - The minimum wage appears to have slightly reduced the employment rate of low-wage workers by about one percentage point. It appears that the *Minimum Wage Ordinance modestly held back Seattle’s employment of low-wage workers relative to the level we could have expected.*
  - Hours worked among low-wage Seattle workers have lagged behind regional trends, by roughly four hours per week, on average.
  - Low-wage individuals working in Seattle when the ordinance passed transitioned to jobs outside Seattle at an elevated rate compared to historical patterns.
- Seattle’s low-wage workers did see larger-than-usual paychecks (i.e., quarterly earnings) in late 2015, but most— if not all—of that increase was due to a strong local economy.
  - Increased wages were offset by modest reductions in employment and hours, thereby limiting the extent to which higher wages directly translated into higher average earnings.
  - At most, 25% of the observed earnings gains—around a few dollars a week, on average—can be attributed to the minimum wage.
- Seattle’s low-wage workers who kept working were modestly better off as a result of the Minimum Wage Ordinance, having \$13 more per week in earnings and working 15 minutes less per week.

#### Jobs:

- Overall, the Seattle labor market was exceptionally strong over the 18 months from mid-2014 to the end of 2015.
  - Seattle’s job growth rate tripled the national average between mid-2014 and late 2015.
  - This job growth rate outpaced Seattle’s own robust performance in recent years.
  - Surrounding portions of King County also had a very good year; the boom appears to fade with geographic distance.
  - Job growth is clearly driven by increased opportunities for higher-wage workers, but businesses relying on low-wage labor showed better-than-average growth as well.
- For businesses that rely heavily on low-wage labor, our estimates of the impact of the Ordinance on the number of persistent jobs are small and sensitive to modeling choices. Our estimates of the impact of the Ordinance on hours per employee more consistently indicate a reduction of roughly one hour per week.
  - Fewer hours per employee could reflect higher turnover rather than cutbacks in staffing.
  - Reductions in hours are consistent with the experiences of low-wage workers.

#### Establishments:

- We do not find compelling evidence that the minimum wage has caused significant increases in business failure rates. Moreover, if there has been any increase in business closings caused by the Minimum Wage Ordinance, it has been more than offset by an increase in business openings.

In sum, Seattle’s experience shows that the City’s low-wage workers did relatively well after the minimum wage increased, but largely because of the strong regional economy. Seattle’s low wage workers would have experienced almost equally positive trends if the minimum wage had not increased. Although the minimum wage clearly increased wages for this group, offsetting effects on low-wage worker hours and employment muted the impact on labor earnings.

We strongly caution that these results show only the short-run impact of Seattle’s increase to a wage of \$11/hour, and that they do not reflect the full range of experiences for tens of thousands of individual workers in the City economy. These are “average” effects which could mask critical distinctions between workers in different categories.

Our future work will extend analysis to 2016, when Seattle’s minimum wage increased a second time and began to distinguish between businesses of different sizes and industries. It will also incorporate more detailed information about workers by linking employment records to other state databases. This will give us a greater capacity to answer key questions, such as whether the workers benefiting most from higher minimum wages are more likely to be living in poverty. We are also in the process of collecting additional survey information from Seattle businesses and conducting interviews with a worker sample tracked since early 2015. The next report, expected in September, will focus specifically on how the minimum wage has affected nonprofit organizations.

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# 1. Introduction

This report uses administrative records from the state of Washington's Employment Security Department (ESD) to estimate the short-run impact of Seattle's Minimum Wage Ordinance on wages, workers, jobs, and establishments through the end of 2015, which was nine months after the ordinance went into effect on April 1, 2015. The ESD data, described in detail below, are gathered quarterly.

While reading this report, it is useful to keep the following key dates (and their corresponding quarters) in mind:

- June, 2014 (End of 2<sup>nd</sup> Quarter): Law was passed.
- April, 2015 (Beginning of 2<sup>nd</sup> Quarter): Law went into effect, requiring the following wages be paid.
  - \$11.00 per hour for Schedule 1 employers (more than 500 employees in the U.S.) and Schedule 2 employers using "guaranteed minimum compensation" (e.g. tips and medical care) to reach \$11.00.
  - \$10.00 per hour for Schedule 2 employers not using "guaranteed minimum compensation."
- 4th Quarter 2015: End of ESD records currently available.
- January, 2016: Minimum wage increased to as much as \$13 (for Schedule 1 employers without medical benefits).

It also is essential to note that this report estimates only the initial effects of the ordinance, examining the first nine months of a planned seven-year phase-in period. In **Figure 1**, we highlight, in orange, the period this report covers. Economic theory predicts the long-run adjustments to a regulatory policy change are likely to be greater than short-run adjustments. Prior research shows that in the long-run, certain industries affected by the minimum wage, such as the fast food industry, have more opportunity to relocate, change the composition of their workforce, or invest in technologies that reduce their need for labor.<sup>2</sup> Similarly, it is likely that any effects of higher earnings on health or family well-being would only emerge over the longer run. Additionally, the impacts that we find for this period, when the highest local minimum wage of \$11 per hour only modestly exceeded the State's minimum wage of \$9.47, may be quite different than the effects we will find following the City's increase to \$13 per hour and above.

This report will address the following questions:

1. What happened to the distribution of hourly wages? Does the change in the distribution match the expected effects of the Minimum Wage Ordinance?
2. What happened to low-wage workers' wages, likelihood of remaining employed, hours worked, total earnings, and likelihood of remaining employed in Seattle?

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<sup>2</sup> See for example Daniel Aaronson, Eric French, and Isaac Sorkin, "Industry Dynamics and the Minimum Wage: A Putty-Clay Approach", Working Paper, 2016, [http://cepr.org/active/publications/discussion\\_papers/dp.php?dpno=11097](http://cepr.org/active/publications/discussion_papers/dp.php?dpno=11097).

3. What happened to jobs, hours worked, and hours per job, particularly at establishments where a large share of employees worked for low wages?
4. What happened to the closure rate and opening rate of establishments in Seattle?

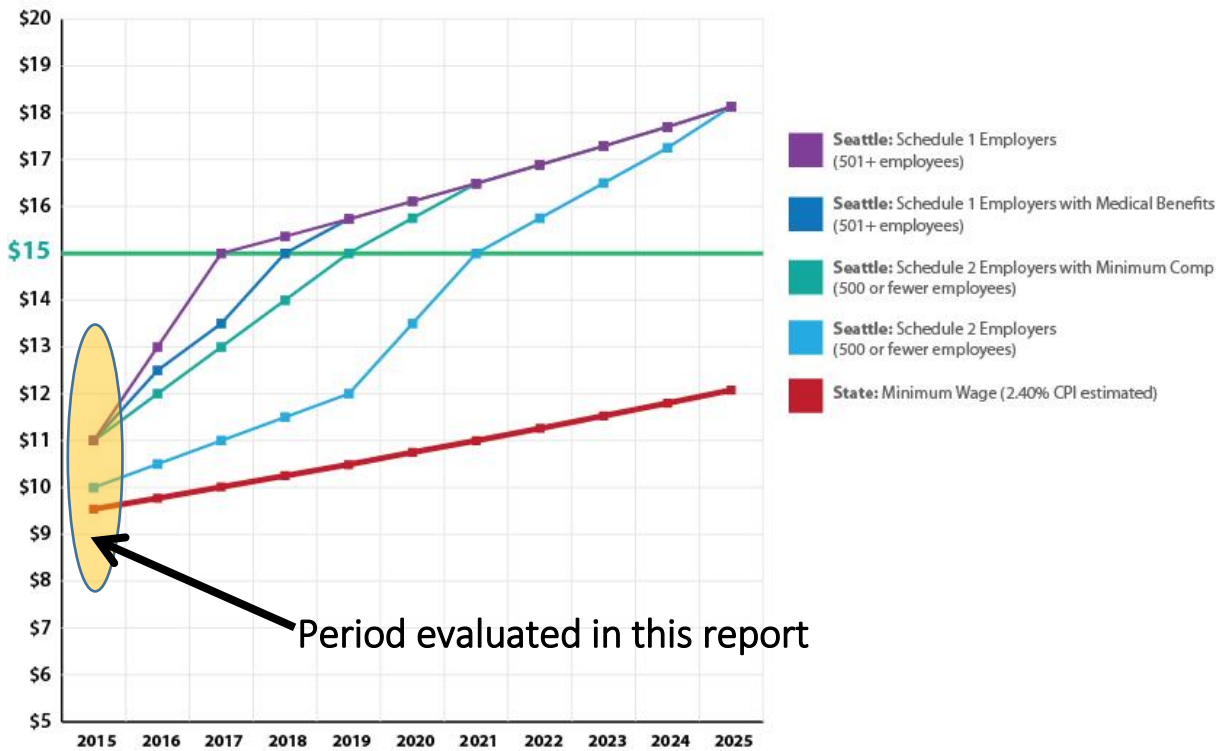
For each of these questions, we will provide answers for *what happened* and for *what is the estimated impact of the Minimum Wage Ordinance*.

The next section explains the data and methodology used to answer these questions. The four sections that follow discuss the impacts on wages, low-wage workers, jobs, and establishment closures and openings, respectively.

Figure 1: Period Evaluated in This Report<sup>3</sup>

# \$15 Minimum Wage in Seattle

## SCHEDULE OF INCREASES



<sup>3</sup> Original source for figure, modified by the Study Team to include the highlighted oval: <http://murray.seattle.gov/wp-content/uploads/2014/05/15Schedule.jpg>

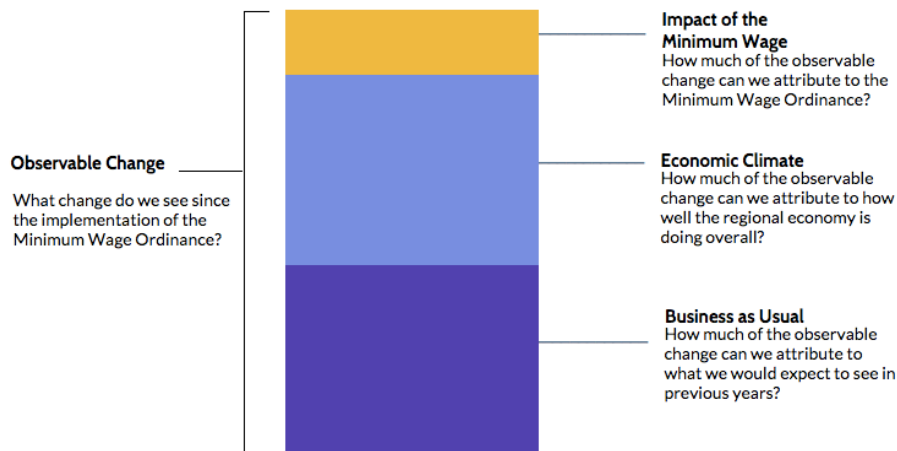
## 2. Methodology, Data, and Outcomes Studied

### Methodology

In addition to evaluating “what happened in Seattle”, we follow the conventions of modern policy evaluation research by asking the question “what happened in Seattle, relative to what would have happened in the absence of an increased minimum wage?” This perspective means that we will not simply look at basic labor market statistics before and after April 1, 2015; this might reveal what happened in Seattle but does not indicate what would have happened in the absence of an increased minimum wage. To take that additional step, we will attempt to construct an estimate of the “counterfactual” and to evaluate the difference between the observed and counterfactual outcomes. City stakeholders with an interest in understanding and speaking about the results of our analysis will be well served to review the distinction between “what happened” and “what happened relative to what would have happened.”

**Figure 2** graphically illustrates our approach, which is to decompose the observable change in outcomes into the portions explained by “business as usual” (Seattle relative to its own prior history), “economic climate” (given by the comparison region), and the remainder, which is our estimate of the causal impact of the minimum wage law.

**Figure 2: The Difference in Difference Strategy**



The most straightforward approach to evaluating the effects of the Minimum Wage Ordinance is analogous to simple “before” and “after” snapshots of labor market trends (i.e., the “observable change”). That is, we examine what occurred in the period when the minimum wage was implemented and compare it to previous periods in Seattle’s recent history. For example, we plot outcomes, notably the share of worker earning under \$11, over time and look for changes in the level or trend of the outcomes following the introduction of the Minimum Wage Ordinance. This method, known as “interrupted time series” relies on the strong assumption that pre-ordinance time-trends would have continued if the ordinance had not passed. But there may be other contemporaneous changes that also affect the outcomes. For example, a sizeable change in national economic conditions could affect business and labor market outcomes in Seattle.

We improve our estimates of the ordinance’s impacts by benchmarking the Seattle experience to both Seattle’s own prior history and to that of comparison regions. This approach, which is called



“difference-in-differences”, compares the difference in outcomes that Seattle experiences over time to the difference in outcomes of a valid comparison group. The change in outcomes in comparison regions serves as the counterfactual for the changes in Seattle. The method captures external influences such as changes in the macroeconomy that affect outcomes in both areas, and removes the effect of such changes from the estimate of the policy impact.

Our comparison regions consist of the following areas:

- King County outside Seattle and SeaTac<sup>4</sup>
- Counties that surround King County, namely Snohomish, Kitsap, and Pierce
- “Synthetic Seattle,” defined as a set of regions in the state of Washington that have matched Seattle’s labor market trends in recent years
- “Synthetic Seattle excluding King County,” to account for potential spillover of the Seattle Minimum Wage Ordinance into labor market of suburban King County

Each comparison region has strengths and limitations. King County outside of Seattle and SeaTac shares a similar industrial mix with Seattle, and therefore its experience would, in ordinary times, serve as a good counterfactual for Seattle. However, using King County outside Seattle as the benchmark may not be appropriate if, as expected, the effect of the ordinance spills over to the rest of King County. As we demonstrated in an earlier report for the City of Seattle<sup>5</sup>, the labor market for low-wage workers in Seattle is highly integrated with the labor markets of King County and surrounding counties. We found that “40% of workers in Seattle earning minimum wage live outside the city” (p. 7), and among Seattle workers earning the minimum wage, only “55% work in the city” (p. 8).

Using Snohomish, Kitsap, and Pierce counties (SKP) attempts to address this spillover problem by using changes in the outcomes of these surrounding counties as the comparison. As one moves further away from Seattle, however, the levels and trends in employment and wages prior to the law’s implementation are not as well matched to the levels and trends in Seattle. Moving from King County to SKP reduces the size of the spillover problem, but leaves us with a less similar comparison group.

A limitation of our methods is that there may be other contemporaneous changes that affect Seattle’s economy but not the economies of the comparison areas, or vice versa. For example, one of the city’s major employers might decide to expand or contract its workforce for reasons completely unrelated to the minimum wage. Or SKP’s economy might experience a significant expansion or contraction of military personnel that, again, would be completely unrelated to the minimum wage. If these differential trends continued after Seattle passed its Minimum Wage Ordinance, the differences in trends could falsely suggest an effect of the minimum wage law.

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<sup>4</sup> We exclude SeaTac from the comparison regions because it raised minimum wage to \$15 for hospitality and transportation workers.

<sup>5</sup> Klawitter, M.M., Long, M.C., and Plotnick, R.D. (2014). “Who Would be Affected by an Increase in Seattle’s Minimum Wage?,” *Report for the City of Seattle, Income Inequality Advisory Committee*.

Such events cannot be controlled for in our analysis, and thus form the main threat to the internal validity of our impact estimates.

To address this concern, our preferred comparison group is what we call “Synthetic Seattle.” This comparison group consists of an aggregate of those zip codes in the state of Washington that in the years 2005 to 2013 had similar levels and trends for the outcome and sample being studied. The details for how “Synthetic Seattle” is constructed are in Appendix B. We construct a second version of this measure that excludes the portions of any zip codes that lie in King County in order to address the possibility of spillover effects.

**Figure 3** on the next page illustrates the zip codes selected for Synthetic Seattle excluding King County and their relative sizes for one outcome (median wage rate) and one particular sample of interest (workers who had <\$11 wages in quarter 0 and who were employed in quarter 6). As can be seen in this figure, the bulk of zip codes selected lie in the Puget Sound region, but some zip codes along the I-5 corridor south to Vancouver, around Spokane, and other parts of the State are likewise selected. This amalgam, while not yielding a contiguous region that is easy to contemplate as a whole, nonetheless performs *very well* in mimicking Seattle in the pre-minimum wage period, as is demonstrated below.

No method for estimating the impact of Seattle’s Minimum Wage Ordinance from secondary data is free of limitations. However, we believe our use of multiple estimation methods yield a better understanding of the likely effects of the policy and how robust the findings are to different methods.

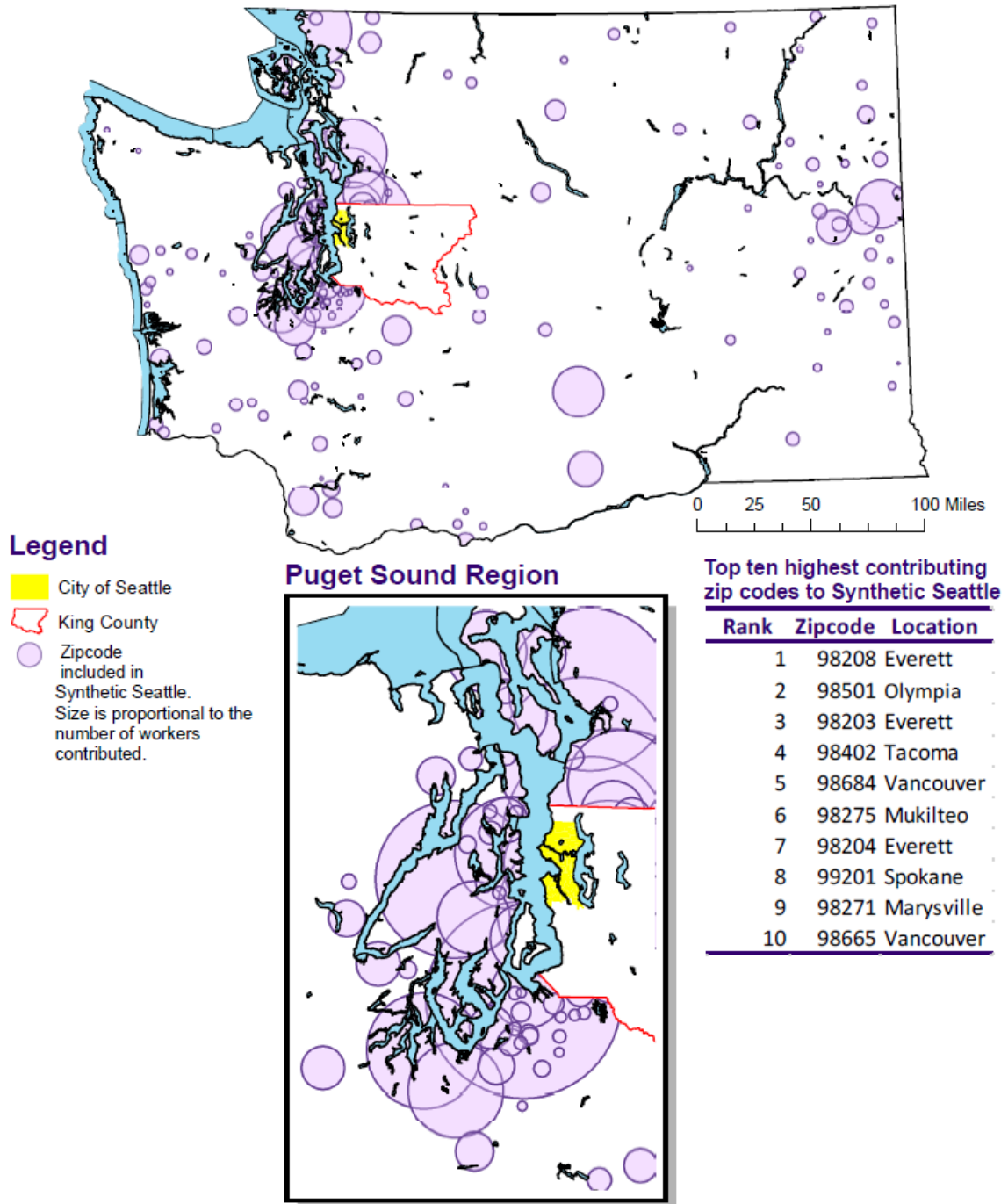
In the main text of this report, we highlight the results from “Synthetic Seattle” (including King County zip codes outside Seattle). We furthermore show the results for the other three comparison regions in tables in Appendix D, E, and F. If the results are sensitive to the choice of comparison region, we note this fact in the main text.

Finally, note that we present our results below as point estimates, but do not include estimates of standard errors on our estimates (that is the degree of statistical uncertainty in our estimated impacts). As we move our work on this project forward, we will carefully consider the right approach for constructing these standard errors. Because the ESD data are close to the full universe of all employees, rather than a sample, one defensible position is that our results are population parameters, not sample estimates, and so standard errors are not needed. Abadie et al. (2014) note that “If the researcher sees all relevant data, there is no need for inference, since any question can be answered by simply doing calculations on the data” – that is, for descriptive analysis of census data, standard errors are not necessary.<sup>6</sup> These same authors note that for causal interpretations, computation of standard errors is necessary as “these standard errors capture the fact that even if we observe outcomes for all units in the population of interest, there are for each unit missing potential outcomes for the treatment levels the unit was not exposed to” (abstract page). Given the lack of standard errors in this draft, some caution should be used in confidently asserting that the Minimum Wage Ordinance *caused* an impact of a particular size. That is, there is some degree of uncertainty in all our causal estimates. This degree of uncertainty is likely to be small for most of our estimates given the large sample sizes we are using.

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<sup>6</sup> “Finite Population Causal Standard Errors”, Alberto Abadie, Susan Athey, Guido W. Imbens, and Jeffrey M. Wooldridge. National Bureau of Economics Working Paper No. 20325 July 2014.

**Figure 3: Synthetic Seattle (Excluding King County)**  
 (For outcome = median wage rate  
 (For sample = workers who had <\$11 wages in quarter 0 and who  
 were employed in quarter 6)



An example can illustrate how our methods show both “what happened?” and “what happened relative to what would have happened without the law?” Consider an important outcome, the percentage of low-paid workers who maintain employment. To answer “what happened,” we first show that among Seattle workers who in the 2<sup>nd</sup> quarter of 2014 who were employed with wages less than \$11 per hour,<sup>7</sup> 65.0% were employed anywhere in the state of Washington at any wage level in the 4<sup>th</sup> quarter of 2015. This is, in the simplest sense, what happened to workers we might have expected to be most affected by the minimum wage increase.

We need to answer a second question though – “how does this employment rate compare to prior years?” We next measure “business as usual” by computing the same 6-quarter change in outcomes for workers in earlier years, namely the 2<sup>nd</sup> quarter of 2005 through 2013. We find that the average rate of employment maintenance for these prior years is 62.4%. By taking the difference of these two figures (65.0% - 62.4%), we find that the employment rate *improved* by 2.6 percentage points for Seattle’s low-wage workers relative to business as usual. Seattle’s low wage workers did better in this recent period than the average over the nine previous years.

It is necessary to assess, however, whether this strong performance reflects the impact of the minimum wage, or other factors. It is possible that 2015 would have been a good year for Seattle’s lowest-paid workers even in the absence of a minimum wage increase. To assess this possibility, and fully estimate “what happened relative to what would have happened,” we do the same differencing from “business as usual” for our comparison region, based on its usual 6-quarter changes in outcomes. Using Synthetic Seattle as the comparison region, for workers in these zip codes who in the 2<sup>nd</sup> quarter of 2014 were employed with wages less than \$11 per hour, we find that they also experienced an improvement in the employment rate relative to business as usual by 3.8 percentage points. While 2015 was a good year for the group of Seattle workers we track, it was an even better year for the workers employed in Synthetic Seattle.

Finally, we take the difference of the Seattle experience from the Synthetic Seattle experience (2.6% - 3.8%) to produce our estimate of the *impact* of the Seattle minimum wage, which is a 1.2 percentage point *decrease* in the employment rate for these low-wage workers. That is, we conclude that Seattle experienced improving employment for low-wage workers, but the minimum wage law somewhat held employment back from what it would have been in the absence of the law.

### **The Employment Security Department Data**

The data to answer our research questions come from administrative records kept by Washington’s Employment Security Department from employers’ records for workers covered by Unemployment Insurance. A detailed discussion of these data, and their limitations are included in Appendix A.

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<sup>7</sup> We have intentionally chosen 2014 Q2 as a baseline in order to capture any anticipatory effects of the ordinance. This allows us to capture early adjustment both from the employers who might raise wages to their workers to comply with the ordinance, and from the workers who might switch jobs or join the labor force in anticipation of the new law.

These data include business and worker IDs, employer addresses, individual quarterly hours, individual quarterly earnings, individual quarterly industry codes, and individual quarterly unemployment benefits. Using these data elements, our study is able to analyze changes in individual employment, hours, and wage levels from quarter to quarter as well as changes in establishment level employment, payroll, and turnover.

One challenge of using this dataset is that we have limited ability to properly locate the work done at large employers with multiple locations in state of Washington, such as retail or restaurant chains with company-owned stores; many of these multi-location firms file a single quarterly report to cover employees at all locations. While we can locate the address given by such multi-location firms, we are unsure whether an individual worker in these firms did his or her work in Seattle, and was thus covered by the Minimum Wage Ordinance, or in another part of the state. Consequently, we focus our analysis on single-location establishments, but separately report outcomes for the combination of single-location establishments and multi-location firms in our Appendix D, E, and F tables.

For our analysis of workers, we place workers into regions (e.g., Seattle, King County Excluding Seattle and SeaTac) based on the location of the worker's primary employer, defined as the one that paid that worker the most in baseline quarter.

In subsequent analyses (except where noted otherwise) we convert nominal quarterly earnings into "real" quarterly earnings by dividing by the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).<sup>8</sup> All wage rates and earnings should thus be considered to be in 2<sup>nd</sup> quarter of 2015 dollars.

## Outcomes Studied

### *Wages and Workers*

The central outcomes that we study for wages and workers are as follows:

- *employed*, defined as having non-zero earnings from at least one job in a given quarter;
- *earnings*, defined as the sum of earnings from all jobs in a given quarter;
- *hours worked*, defined as the sum of hours worked in all jobs in a given quarter;
- *hourly wage rate*, defined as the sum of earnings from all jobs in quarter divided by hours worked in all jobs in quarter;
- *remaining in the same region*, defined as having a job in the same region as in a baseline quarter.

### *Jobs*

We additionally investigate the impact of Seattle's Minimum Wage Ordinance on jobs. The Employment Security Department Data used in this report is an imperfect tool for counting the

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<sup>8</sup> We use the not seasonally adjusted CPI-W (rather than the more commonly used CPI-U) as the state of Washington indexes the state minimum wage to the CPI-W. A discussion of the differences between the two price indexes and the limitations of the CPI-W can be found in Stephen B. Reed and Kenneth J. Stewart, "Why does BLS provide both the CPI-W and CPI-U?," *Beyond the Numbers: Prices & Spending*, vol. 3, no. 5 (U.S. Bureau of Labor Statistics, February 2014), <http://www.bls.gov/opub/btn/volume-3/why-does-bls-provide-both-the-cpi-w-and-cpi-u.htm>.

number of jobs in Seattle. When it comes to counting jobs, the tally of persons employed in Seattle – or anywhere – can and does fluctuate remarkably from day to day or month to month. Each job is counted uniquely; if a person has three jobs, they will be counted in three separate data points. The central outcomes that we study for jobs are as follows:

- *total headcount in quarter*, defined as the number of workers on payroll in the current quarter in establishments which were open in the current quarter;
- *number of jobs at the beginning of quarter*, defined as the number of workers on payroll in the current and previous quarter in establishments which were open in this and the previous quarter; this outcome most corresponds to a measure of employment published by the Quarterly Census of Employment and Wages (see Appendix A for discussion of the measures of employment in the ESD data)
- *total hours worked in quarter*, defined as the sum of hours worked in all jobs in the quarter in currently open establishments;
- *average hours worked per job*, defined as the total number of hours worked in the quarter divided by the total number of workers who were on payroll in the quarter in all currently open establishments.

The data allow us to count up the total number of employer-employee relationships that existed at any point over a three-month period. We refer to this concept as “headcount.” Headcount may overstate the number of jobs available on a given day. Consider a small business with one wage-earning employee. If that employee quits in April and is replaced by a new employee in May, the quarterly report for the business will report a headcount of 2, even though there is never more than a single job in the business at one time.

To more accurately measure the number of jobs available in Seattle at a given point in time, we focus attention on employer-employee relationships that we know to have existed at the beginning of an ESD reporting period. In the hypothetical example above, the small business in question would be counted as having one “persistent” job for the quarter, presuming that the employee who quit had been employed before April. Both headcount and persistent job measures are potentially useful in certain circumstances.

First, we study the changes in these outcomes for all currently open establishments, which include establishments which opened since baseline quarter and contributed to job creation.

Next, we study jobs, hours and total wages paid by establishments which are likely to be particularly vulnerable to the increase in minimum wage – those establishments which paid more than 40% of their workers less than \$11 in the baseline quarter. We track this group of establishments over time, and report the total number of jobs, hours, and wages paid for those establishments which remained open in each subsequent quarter after the baseline.

### ***Establishments***

We will also present results of labor market outcomes for Seattle businesses. There were nearly 21,000 single-location establishments in Seattle in 2014 Q2. The outcomes of interest are:

- *Share of Establishments in Current Quarter Which Opened Since Baseline Quarter*
- *Share of Establishments Which Closed Since Baseline Quarter*

### 3. Impact of Seattle’s Minimum Wage Ordinance on Wages

**Figure 4** tallies the number of workers primarily employed at single-location Seattle businesses with wages in specific one-dollar increments in the baseline quarter during which the Seattle minimum wage was passed (2<sup>nd</sup> quarter of 2014) and six quarters later (4<sup>th</sup> quarter of 2015). This figure includes only workers earning less than \$25 per hour as we do not anticipate Seattle’s Minimum Wage Ordinance to have cascading effects on wages above this level. Tallies from the earlier period are represented by solid bars and from the more recent period by transparent outlines.

Note that in the baseline quarter, the state of Washington’s minimum wage was \$9.32 per hour, and we see that a large share of workers in this figure were earning between \$9 and \$10 per hour.<sup>9</sup> Six quarters later, we see a clear decrease in the share of Seattle’s workers earning between \$9 and \$11 per hour, which would suggest that the minimum wage caused an upgrading of worker’s wages. We see sizable gains in the share of workers earning between \$11 and \$16 per hour.<sup>10</sup>

The figure clearly shows a stark reduction in the number of workers earning between \$9 and \$10 per hour; there were 19,056 such workers in mid-2014 but only 7,330 at the end of 2015. The number of workers earning between \$10 and \$11 per hour fell from 21,470 to 15,469.

As the number of workers earning under \$11 shrank, the number earning \$11-13/hour rose significantly, and the number earning \$13-19/hour rose enough to be noticeable on this chart. The number of workers with average hourly wages in each increment above \$19/hour shows very little change.

A direct comparison of the size of the bars in **Figure 4** shows that the total number of workers represented declined over time. In other words, the reduction in the number of workers earning under \$11/hour exceeds the increase in workers earning \$11-19/hour shown here. Over a time period where the Seattle economy added tens of thousands of jobs, the number of workers employed at single-location firms earning wages under \$25 declined by 7,385, or about 3.3% of the baseline number, with all of that change accounted for by a decline in workers earning under \$19/hour.

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<sup>9</sup> There is a small share of workers who *appear* to be earning less than \$9 per hour. We caution readers to be aware that this result could be due to inaccuracies in the employer’s report of the employee’s number of hours worked in the quarter. Inaccurate reports that overstate hours would result in our computed hourly wage rate being too low. This could also reflect accurate reporting of hourly wage rates for certain employees who are exempt from the minimum wage law.

<sup>10</sup> Note that in our report in April, 2016 based on surveys of firms, we noted “Roughly one-fifth of all firms reported a wage level higher or lower than the Ordinance required, with almost one in ten firms (11.9%) indicating the Ordinance required them to pay a \$15 per hour minimum wage as of April 1, 2015.” (The Seattle Minimum Wage Study Team. 2016. *Report on Baseline Employer Survey and Worker Interviews*. Seattle. University of Washington.)

Figure 4: Nominal Hourly Wage Rate Distribution of Seattle’s Workers (for those earning <\$25 per hour)

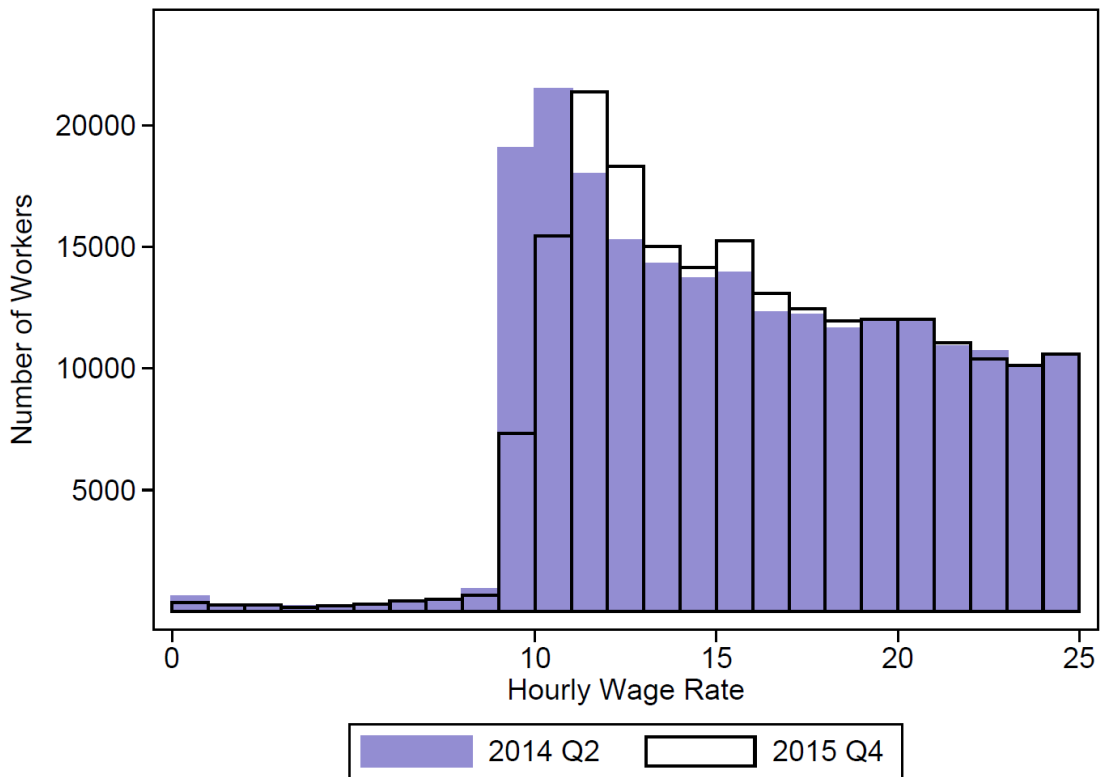


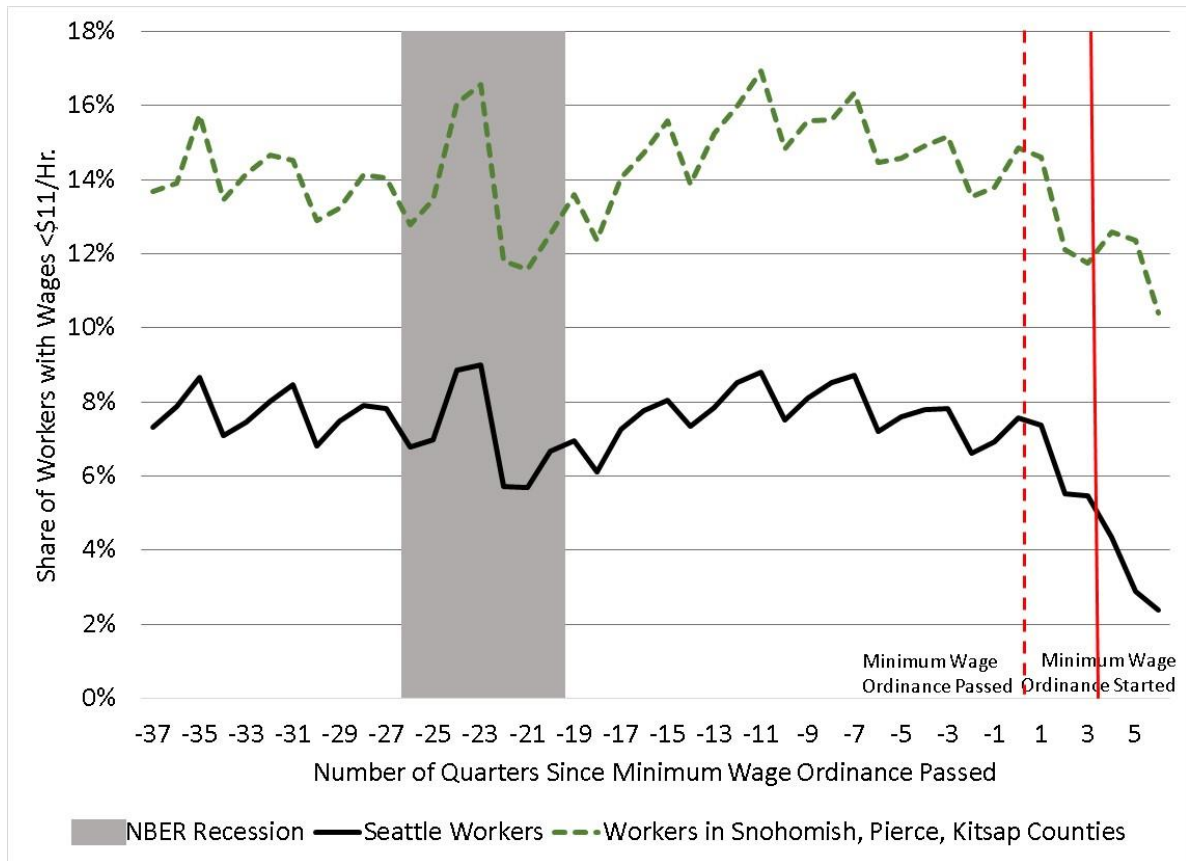
Figure 5 charts the proportion of workers with (inflation-adjusted) wages under \$11 per hour from 2005 through the end of 2015. The period between late 2007 and early 2009, identified as the beginning and end dates of the most recent recession, is marked in gray on this graph. This figure is not seasonally adjusted; the regular dips and peaks reflect seasonal fluctuations in the economy.

In this figure we show that the share of Seattle’s workers earning less than \$11 per hour was relatively stable prior to the passage of the Minimum Wage Ordinance<sup>11</sup>, aside from seasonal fluctuations. It began falling rapidly after passage of the law. This result suggests that firms began responding immediately to the new ordinance by raising wages in anticipation of the ordinance coming into force.

<sup>11</sup> The regular ups and downs shown in this time series reflects the importance of seasonal variation in types of employment; low-wage employment peaks are generally in summer months during tourist season and summer closure. The shaded region on Figure 5 shows the period of the Great Recession according to the National Bureau of Economic Research (<http://www.nber.org/cycles.html>).



Figure 5: Temporal Changes in the Wage Rate Distribution in Seattle and Snohomish, Pierce, Kitsap Counties Between 2005 and 2015.



However, when we do the same interrupted time series analysis for workers in Snohomish, Pierce, and Kitsap counties, we see a very similarly timed drop in the share of workers earning less than \$11 per hour. The similarity of the timing of the decline suggests that broader macroeconomic forces, and to some extent typical seasonal fluctuation, may have been the cause of the decline in the share of workers earning less than \$11 per hour. The next sections of this report will endeavor to more carefully and systematically rule out these other possible explanations.

Finally, it is worth reflecting on the differences between the time series evidence for Seattle versus Snohomish, Pierce, and Kitsap counties. Historically, Seattle has had a lower share of workers earning less than \$11 per hour than in SKP, and the variability and seasonality of the share of workers earning less than \$11 has been less in Seattle than in SKP. These results suggest that SKP may not be a perfect comparison group for Seattle – more specifically, the macroeconomy may be affecting SKP differently than Seattle. This concern motivates our use of “Synthetic Seattle” as our favored comparison region, as “Synthetic Seattle” is chosen so as to specifically match Seattle’s pre-minimum wage levels and trends in outcomes.

**Key findings:**

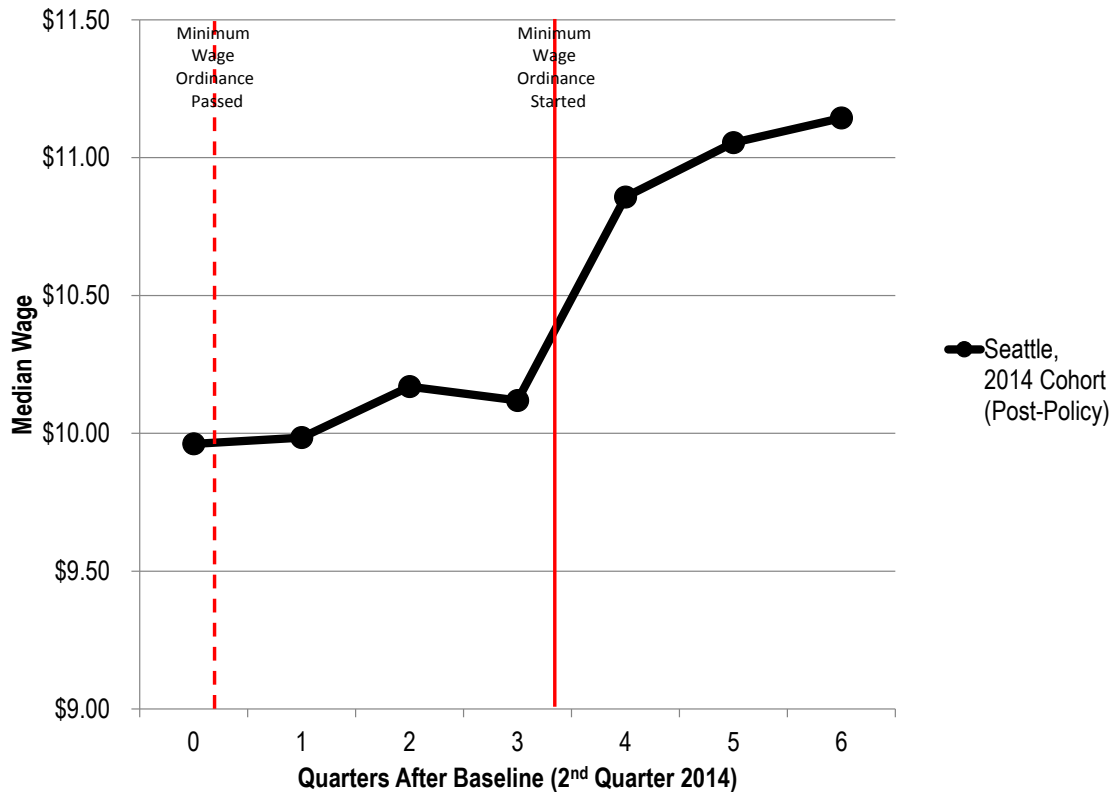
- The distribution of wages shifted as expected.
- The share of workers earning less than \$11 per hour declined sharply.
- Decline began shortly after the ordinance was passed.
- However, similar declines were seen outside of Seattle, suggesting an improving economy may be the cause of the change in the distribution of wages.

## 4. Impact of Seattle’s Minimum Wage Ordinance on Low-Wage Workers

While the prior section tells us that the distribution of wages changed in the expected manner (i.e., a large reduction in the share of workers earning less than \$11 per hour). This section, builds on the prior section by evaluating how this change in the wage distribution affected low-wage workers. In this section, we follow cohorts of low-wage workers longitudinally to see how their labor market outcomes changed. We focus on five key outcomes: Wages, Employment, Hours Worked, Quarterly Earnings, and Remaining Employed in Seattle.

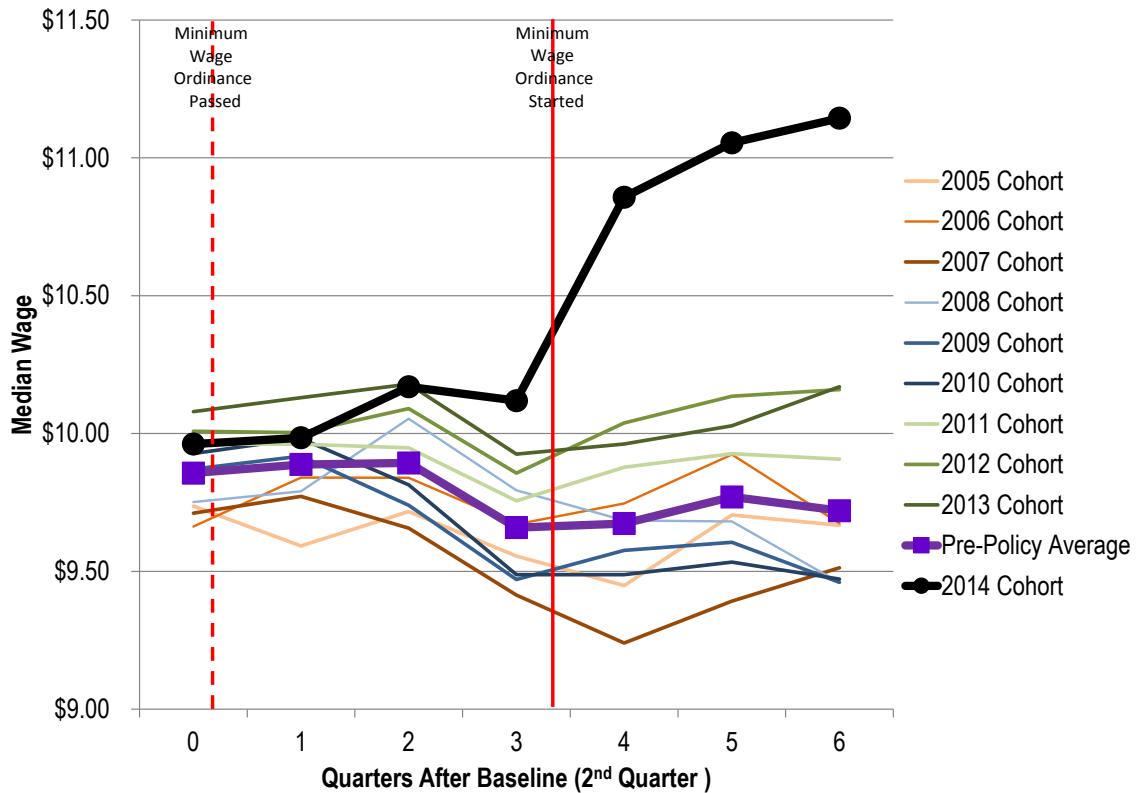
**Wages:** Figure 6 shows the median wage for a “post-policy” cohort of workers who in the baseline quarter (2<sup>nd</sup> quarter of 2014) were working in Seattle and earning less than \$11 per hour. We follow this cohort of workers forward in time for the next six quarters and compute their median wage (with \$0 per hour imputed for those who are not working in the state of Washington in that quarter). We find that median wage for this cohort of workers increased from \$9.96 to \$11.14 over the next six quarters. While it would be intuitive to attribute this increase to the Minimum Wage Ordinance, our methodology requires us to compare “what happened” to estimates of what “would have happened” in the absence of the Minimum Wage Ordinance.

Figure 6: Median Wages for Cohort of Seattle Workers Who Earned < \$11 Per Hour in 2<sup>nd</sup> Quarter of 2014



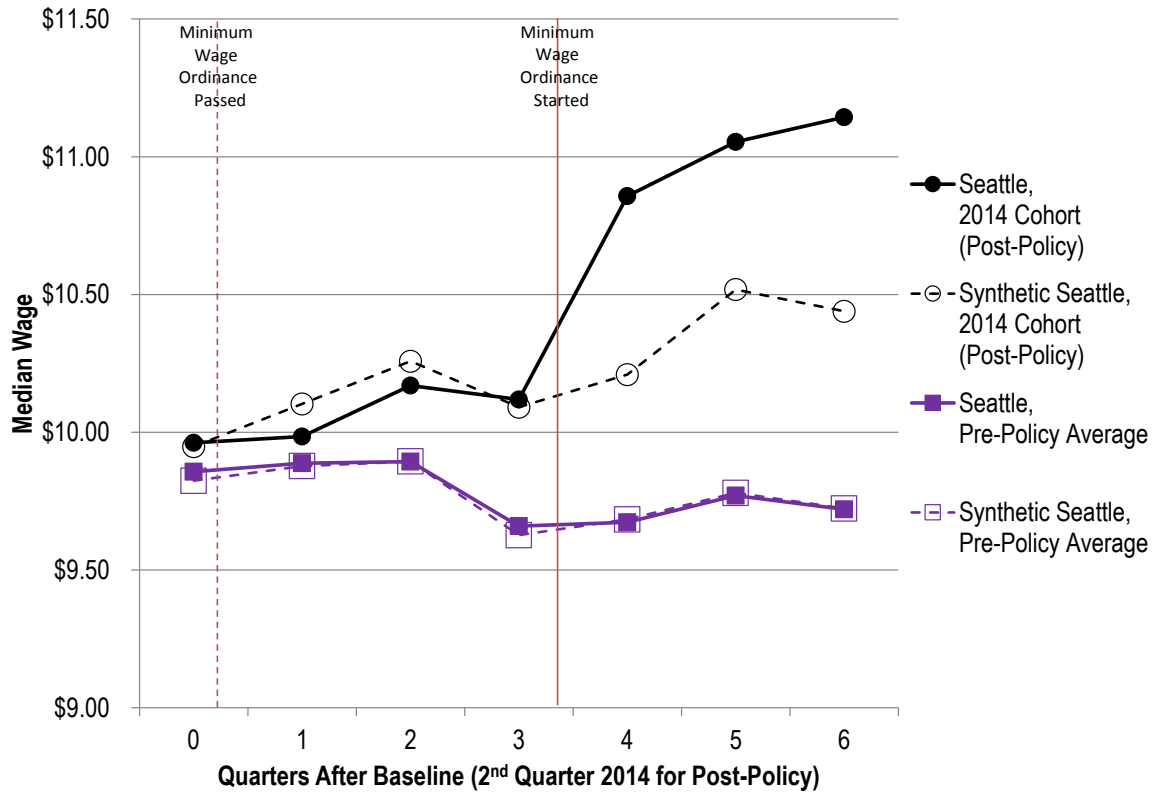
**Figure 7** repeats this analysis for the prior nine cohorts (2005 to 2013), with the baseline always beginning in the 2<sup>nd</sup> quarter of the year. We characterize “business as usual” as the average of the 2005 to 2013 cohorts. There are two things to note from this chart. First, the increase in median wages experienced by the 2014 cohort between the 3<sup>rd</sup> and 4<sup>th</sup> quarter post baseline (i.e., at the time that the minimum wage started) was *far* outside of the historical norm. This result provides strong evidence that the minimum wage likely caused these workers’ wages to rise. Second, while there was some improvement in recent years, as demonstrated by 2011, 2012, and 2013 cohorts, the experience of the 2014 cohort vastly exceeds these recent cohorts beginning at the time the minimum wage law went into effect.

**Figure 7: Median Wages for Cohorts of Seattle Workers Who Earned < \$11 Per Hour in 2<sup>nd</sup> Quarter of 2005, 2006, ..., and 2014**



Next, to assess whether the result shown above is due to the minimum wage law or macroeconomic forces, we repeat this analysis for Synthetic Seattle and report the differences with Seattle. **Figure 8** presents the results. First, note that Synthetic Seattle is a very good match for Seattle in the pre-policy year, as can be seen by the similarity of the solid and dashed purple lines. Second, note that the strong economy can be seen in Synthetic Seattle by comparing the dashed black line for post-policy Synthetic Seattle with the dashed purple line for the pre-policy average cohort in Synthetic Seattle. Thus, some of the gain in wages seen in Seattle for these low-wage workers is likely due to the strong economy. However, Seattle begins to diverge and exceed Synthetic Seattle just as Seattle’s Minimum Wage Ordinance comes into effect.

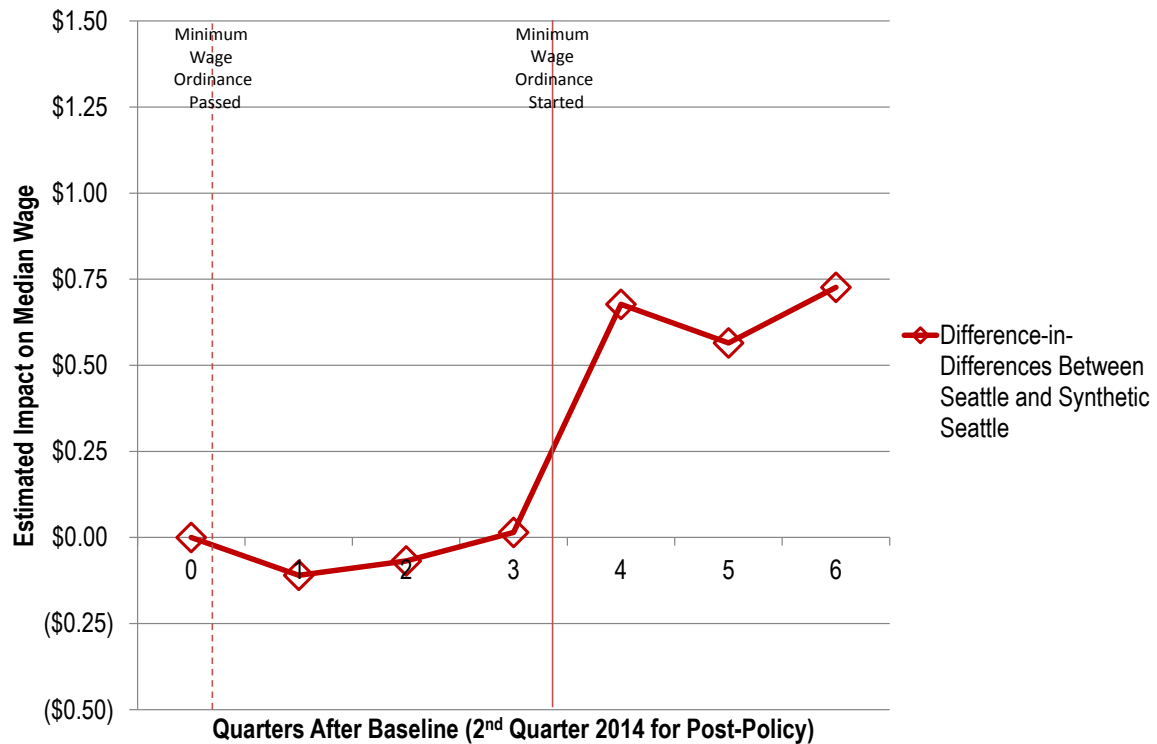
Figure 8: Median Wages for Seattle and Synthetic Seattle Workers Who Earned < \$11 Per Hour in the 2<sup>nd</sup> Quarter



We find that these low-wage workers’ median hourly wage increased by \$1.18. “Business as usual” for such workers (as given by the historical change in Seattle for such workers) is a \$0.14 loss in hourly wage rate. Thus, relative to Seattle’s own history, such workers’ median hourly wage rate rose by \$1.32. A sizable portion of this gain, however, can be attributed to the strong macroeconomy. Therefore, we estimate *the effect of Seattle’s Minimum Wage Ordinance as a \$0.73 increase in these workers’ median hourly wage rate* (based on the difference-in-differences between Seattle and Synthetic Seattle. **Figure 9** graphically shows our estimate of the impact of the Minimum Wage Ordinance (i.e., the difference-in-differences) on median wages for these low-wage workers.

In the remainder of this report, in the interest of brevity, we evaluate changes between the baseline (t=0) and six quarters hence (t=6), but do not report the intervening quarters (t=1 to t=5). In the main text of the report, we discuss the central findings. The full results are in Appendix D.

Figure 9: Estimated Impact of Seattle’s Minimum Wage Ordinance on the Median Wages for Seattle Workers Who Earned < \$11 Per Hour in the 2nd Quarter of 2014



Our evaluation for other labor market outcomes for these low-wage workers parallels the above analysis of wages.

**Employment:** While the intended effect of the Minimum Wage Ordinance (i.e., raising low-wage workers’ wages) appears to have been successful, there appears to have been some negative impacts on these worker’s rates of employment and hours worked. As noted previously, the rate of employment of these workers increased by 2.6 percentage points. However, the comparison regions all experienced even better employment rate increases (3.8% for Synthetic Seattle, 3.9% for Synthetic Seattle Excluding King County, 3.5% for SKP and 2.9% for King County Excluding Seattle and SeaTac). Thus, it appears that the *Minimum Wage Ordinance modestly held back Seattle’s employment of low-wage workers relative to the level we could have expected.*

**Hours worked:** Hours worked shows a similar pattern. Among workers earning less than \$11 per hour at baseline in Seattle, hours worked increased by 12.2 relative to business as usual.<sup>12</sup> So, again, Seattle’s employment situation for low-wage workers improved after the Minimum Wage Ordinance was passed. Hours worked increased, however, by more in the comparison regions (16.4 for Synthetic Seattle, 13.0 for Synthetic Seattle Excluding King County, 21.5 for SKP and 22.5 for King County Excluding Seattle and SeaTac). Thus, on balance, it appears that the *Minimum Wage Ordinance modestly lowered hours worked* (e.g., 4.1 hours per quarter relative to Synthetic Seattle, or 19 minutes per week).

<sup>12</sup> On average, these low-wage workers worked 276 hours in the 2<sup>nd</sup> Quarter of 2014.

**Quarterly earnings:** Given the gains in hourly wage rates, but the offsetting declines in rates of employment and hours for low-wage workers relative to similar workers in comparison regions, it should not come as a surprise that we find small effects on low-wage workers' quarterly earnings. Quarterly earnings for Seattle workers earning less than \$11 per hour at baseline increased by \$463 relative to "business as usual" – again, this was a good six quarter stretch for low-wage Seattle workers. Most if not all of this gain in quarterly earnings can be explained by the robust economy rather than the Minimum Wage Ordinance. For example, similarly situated workers in Synthetic Seattle saw their quarterly earnings rise by \$391 – which would suggest that the Seattle Minimum Wage Ordinance *increased* quarterly earnings by \$72 (or \$5.54 per week). This modest positive result is sensitive to the comparison region; King County outside Seattle and SeaTac and SKP saw quarterly earnings rise by \$531 and \$495, respectively, for similarly situated workers, which would suggest that the Seattle Minimum Wage Ordinance *decreased* quarterly earnings by \$68 or \$32 respectively (or \$5.22 or \$2.43 per week, respectively). The bottom-line here is that *the effect of the Seattle Minimum Wage Ordinance on low-wage workers' earnings is ambiguous and likely fairly small.*

**Effects for those who remained employed:** When we restrict our analysis to workers who earned less than \$11 per hour in the baseline quarter *and were employed anywhere in Washington six quarters hence* we find clearly positive impacts of Seattle's Minimum Wage Ordinance. For such workers in Seattle, median hourly wage rates increased \$1.03 relative to "business as usual" and this growth in earnings exceeded that experienced by all comparison regions; using Synthetic Seattle as the comparison region, for workers who kept their jobs, we find that the impact of the ordinance was to raise these workers' median hourly wages by \$0.31. These Seattle workers increased their hours worked by 7 hours per quarter relative to baseline, but this was less than all comparison regions. Using Synthetic Seattle as our comparison region, we find that the impact on hours for those who kept their jobs was -3.2 hours per quarter, or 15 minutes per week. From the perspective of the workers, a modest cut in hours might be considered a *good* thing if it doesn't adversely affect earnings. Yet, we find that earnings for these Seattle workers who kept their jobs increased by \$542 per quarter (a sizable gain given their baseline quarterly earnings of \$2,524) and this increase was greater than all comparison regions, which suggests that Seattle's Minimum Wage Ordinance raised these workers' earnings by \$164 using Synthetic Seattle as our comparison region, or \$13 per week, a 6.5% increase relative to earnings in the baseline quarter. Thus, *if you kept working, you were modestly better off as a result of the Minimum Wage Ordinance, having \$13 more per week in earnings and working 15 minutes less per week.*

**Remaining in Seattle:** While low-wage workers may be finding employment opportunities, it is not necessarily the case that they are finding such work in Seattle, per se. Among those workers who earned less than \$11 per hour in the baseline quarter and who were employed somewhere in Washington six quarters hence, only 70.1% of them are still working in Seattle. While this figure may sound like a large drop, the typical rate found for the prior nine cohorts was 73.4% of such workers remaining in Seattle. Thus, relative to business as usual, we find a decline of 3.3 percentage points in the share of such workers remaining in Seattle. We compare this relative to decline to that experienced in Snohomish, Kitsap, and Pierce counties (as remaining in "Synthetic Seattle" is a not well defined concept). We find that, relative to business as usual, there was a decline of 0.5 percentage points in the share of such low-wage workers remaining employed in SKP rather than elsewhere in the state. Differencing these results, we conclude that the *Seattle*

*Minimum Wage Ordinance reduced the probability of low-wage workers continuing to work in the Seattle (rather than elsewhere in the state) by 2.8 percentage points.*

**Table 1** summarizes the estimated impacts for key outcomes for workers earning <\$11, \$11-\$13, \$13-\$15, and \$15-18 at baseline using Synthetic Seattle as the comparison region, and documents if the sign of the effect (i.e., positive or negative) varies when using different comparison regions. (Detailed tables from which these results are drawn are in Appendix **Table D 1-Table D 4**) Across all baseline wage groups, we find a positive estimated impact of Seattle’s Minimum Wage Ordinance on median wage rates, and these estimated impacts are smaller for groups that started with higher baseline wages. Second, note that most of the estimated impacts on likelihood of employment, hours worked, and quarterly earnings are sensitive to the selected comparison group for those whose baseline wage rates are \$11-\$13, \$13-\$15, and \$15-18. Thus, while there is some evidence that the Minimum Wage Ordinance caused increasing hourly wages for those who began above \$11 per hour, there is less clear evidence that it affected these workers’ other labor market outcomes.

**Table 1: Estimated Impacts for Key Outcomes for Workers Earning <\$11, \$11-\$13, \$13-\$15, and \$15-18 at baseline, and Sensitivity of Results to Selected Comparison Regions**

	<\$11	\$11-\$13	\$13-\$15	\$15-\$18
<b>PANEL A: ALL WORKERS</b>				
Median Wage	\$0.73	\$0.22	\$0.38 *	\$0.27
Share Employed	-1.2%	-0.1% *	0.0% *	-0.5% *
Mean Hours Worked	-4.1	3.3 *	6.8 *	3.0 *
Median Quarterly Earnings	\$72 *	-\$23 *	\$301 *	\$219 *
<b>PANEL B: WORKERS EMPLOYED IN 4TH QUARTER OF 2015</b>				
Median Wage	\$0.31	\$0.25	\$0.11 *	\$0.10
Mean Hours Worked	-3.2	-1.2	1.3 *	3.0 *
Median Quarterly Earnings	\$164	\$11 *	\$107 *	-\$36 *
Share Who Remain in the Same Region	-2.8%	-0.7%	-0.7%	-1.3%

\* Denotes that the sign of this apparent impact is reversed using a different comparison region

**Key findings:**

- Seattle workers who started out with wages <\$11 saw their median wage rise by \$1.18.
  - This growth was greater than in prior years.
  - This growth was greater than in comparison regions.
  - Our best estimate of the impact of the Seattle Minimum Wage Ordinance is a \$0.73 increase in median wages of low-wage Seattle workers.
- Seattle workers who started out with wages <\$11 experienced an improved likelihood of being employed and worked longer hours relative to prior years.



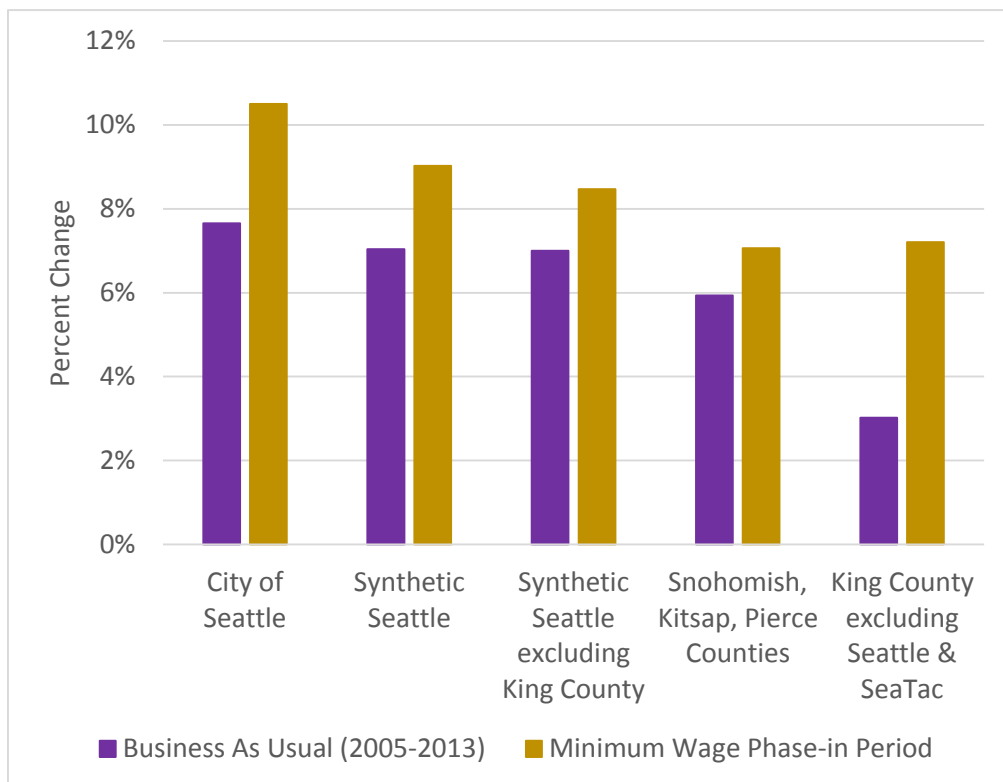
- However, this growth was less than in comparison regions.
  - Our best estimate of the impact of the Seattle Minimum Wage Ordinance is a 1.2 percentage point decrease in likelihood of low-wage Seattle workers remaining employed and a 4 hour per quarter decrease in hours worked.
- The net effect on earnings is sensitive to the comparison region selected.
- Our best estimate is a \$72 increase per quarter (3% above baseline).
- The effects of the Seattle Minimum Wage Ordinance on low-wage workers who remained employed are mostly encouraging.
- Our best estimate of the impact of the Seattle Minimum Wage Ordinance on these workers is a \$0.31 per hour increase in wages, 3.2 hour per week decrease in hours worked per quarter, and a \$184 increase in quarterly earnings. Thus, for those who keep their jobs, the ordinance appears to lead to higher earnings and fewer hours worked.
  - However, these workers were 3.3 percentage points less likely to remain employed in Seattle (rather than elsewhere in the state of Washington), and this change appears to be mostly due to the Minimum Wage Ordinance.

## 5. Impact of Seattle’s Minimum Wage Ordinance on Jobs

The Minimum Wage Ordinance came into effect in a period of rapid employment growth in the City of Seattle. Between the spring of 2014, when the Minimum Wage Ordinance was passed, to the end of calendar 2015, the number of persistent jobs at single-location businesses in Seattle rose 10.5%. This is more than three times the growth rate for the United States as a whole, based on the Bureau of Labor Statistics’ Current Employment Statistics (Establishment Survey).

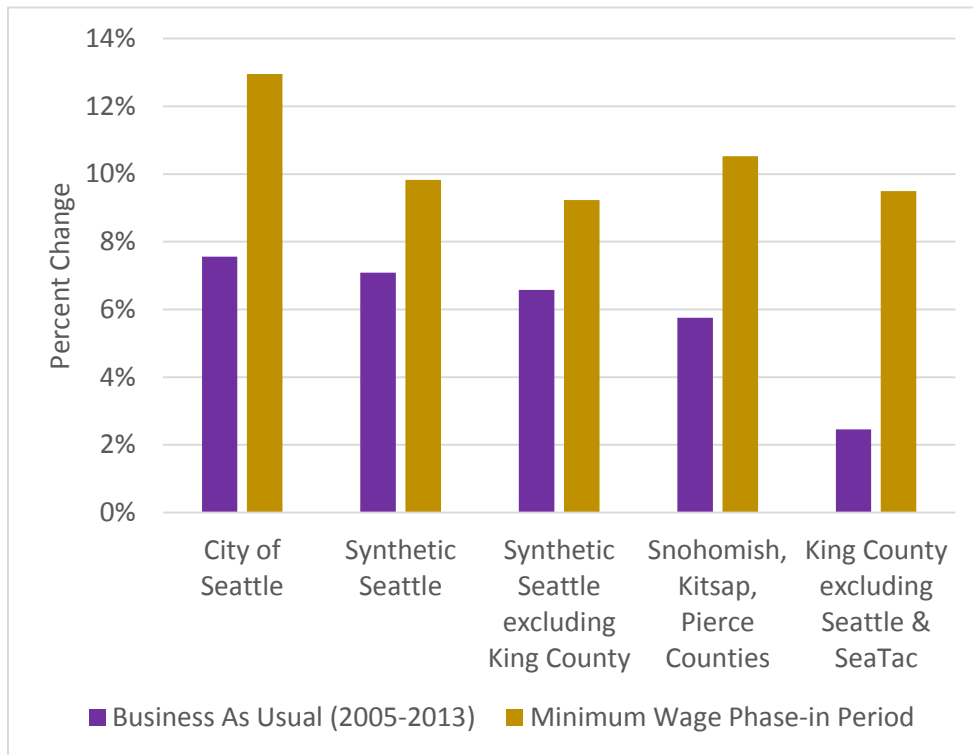
Seattle has a strong track record of employment growth in prior periods – between 2005 and 2013, persistent jobs grew an average of 7.7% over six quarters starting each spring. Even compared to this baseline, however, 2015 was clearly a very strong year. Appendix [Table E 1](#) shows that 2015 was also a strong year in the comparison regions we use to infer what might have happened in Seattle in the absence of the minimum wage. Compared to recent history as shown in [Figure 10](#), the 2015 boom appears to have been even stronger in King County outside Seattle and SeaTac, and slightly weaker farther afield. Only the City of Seattle, however, posted growth in the double-digits.

Figure 10: Change in Persistent Jobs (all single-location businesses)



Seattle’s boom appears even stronger when we measure work effort not by the number of persistent jobs but by the total number of hours worked. This measure grew by 13% between mid-2014 and the end of 2015. By this measure as well, the boom appears strongest relative to the historical pattern in the region immediately surrounding Seattle and weaker further afield, as shown in **Figure 11**. We caution against interpreting Seattle’s boom in job growth as an outcome of the Minimum Wage Ordinance. There are clearly other stories to be told about the impressive run of job growth in Seattle: large businesses are adding high-salary jobs at an impressive rate, and opportunities in industries such as construction are plentiful in a City enjoying population growth.

**Figure 11: Change in Total Hours Worked (all single-location businesses)**

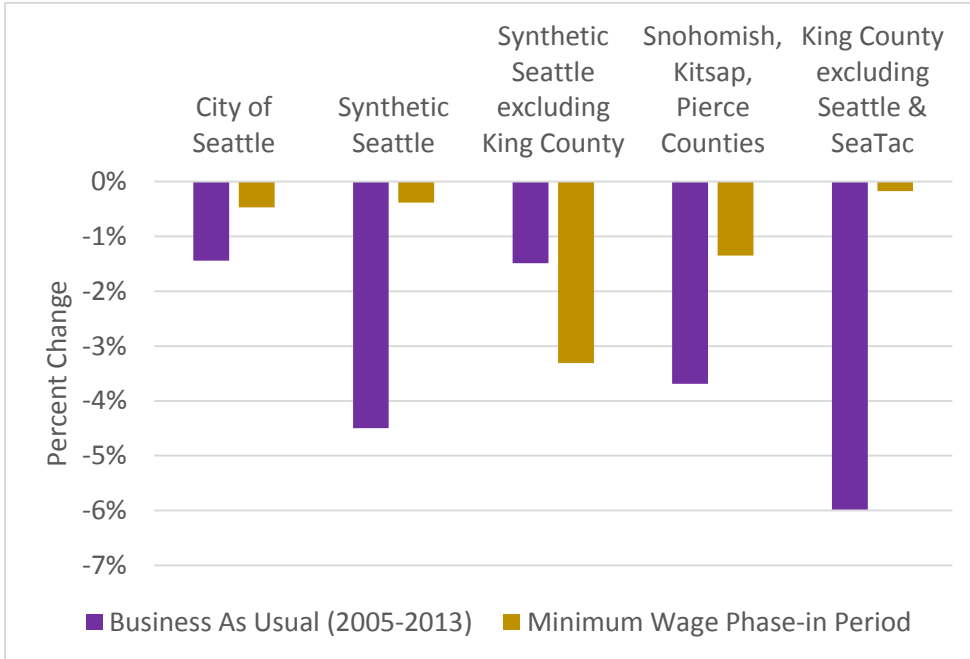


The more relevant question is what happened to jobs and hours worked at businesses reliant on low-wage labor. Note that the seasonality of low-wage work in Seattle is a more important phenomenon for these low-wage employers; businesses reliant on low-wage labor tend to contract from second to fourth quarters. (Recall that the baseline period represents April-June 2014, and the post-minimum wage period October-December 2015). We focus on a set of businesses where over 40% of those employed in the second quarter of 2014 earned less than \$15 per hour. Of 21,238 total single-location businesses in Seattle, 7,792 (37%) fell into this category.<sup>13</sup>

<sup>13</sup> These businesses tend to be smaller than the average for our data; although they comprise 37% of all businesses they account for only 23% of all jobs.

Compared to the Seattle economy as a whole, these businesses have had a more modest recent track record. Between 2005 and 2013, when comparing employment in a given 2<sup>nd</sup> quarter to the tally of persistent jobs six quarters later, the typical pattern is a decline, as shown in [Figure 12](#). It is clear that low-wage businesses have not been the growth engine of the Seattle economy.

**Figure 12: Change in Persistent Jobs at Single-Location Businesses Where Over 40% of Those Employed in 2<sup>nd</sup> Quarter of 2014 Earned <\$15 Per Hour**

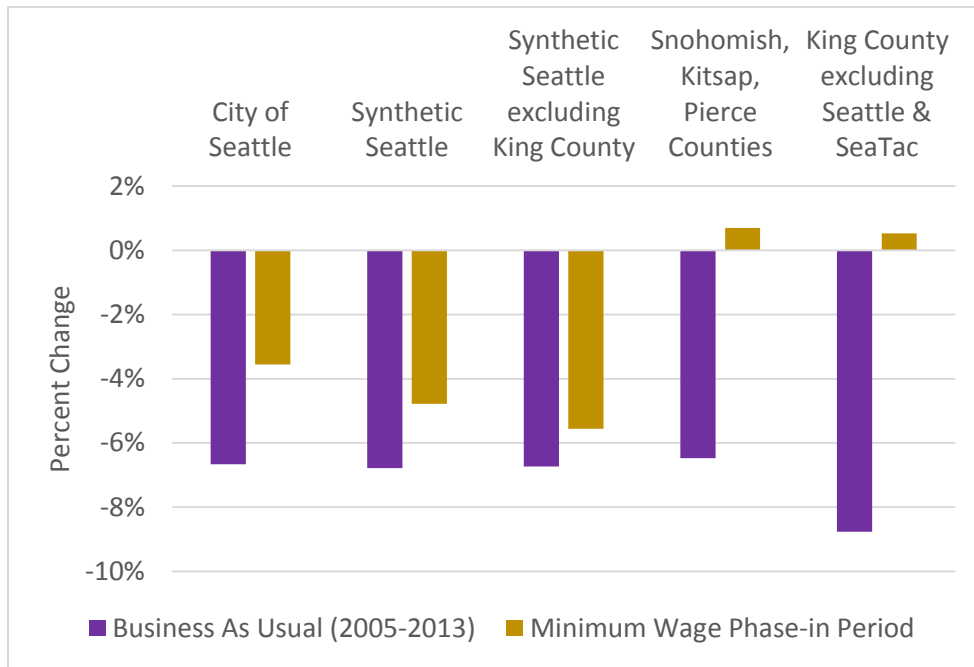


The half-percentage-point reduction in persistent jobs at these businesses between mid-2014 and late-2015 is actually a positive development, as these businesses contracted more slowly than usual in the historical record. We find the exact same pattern in Synthetic Seattle, *suggesting that the minimum wage had little or no net impact on the number of persistent jobs*. This result varies substantially across alternate comparison regions, with some estimates suggesting positive effects and others negative.<sup>14</sup>

<sup>14</sup> Measuring employment by headcount rather than by persistent jobs changes the picture only slightly. Once again, the basic historical trend suggests that businesses reliant on low-wage labor tend to contract over a six-quarter period. The contraction observed between mid-2014 and late-2015 was once again modest relative to this historical pattern. We do not observe a comparable trend in Synthetic Seattle, leading us to attribute a more positive effect of the minimum wage on headcount. The estimate once again shows some sensitivity to the choice of comparison region. The pattern of strong headcount effects relative to persistent job effects suggests that the minimum wage may be increasing turnover in the low-wage labor market. This may be a healthy development, reflective of employees identifying new opportunities and leaving their jobs voluntarily. It could, however, also reflect increased firings and dismissals. Lacking data on the reasons why employees leave their jobs, we are unable to distinguish between these explanations.

A final method of measuring employment opportunities for lower-paid workers focuses on total hours worked rather than jobs. Like measures of headcount and persistent jobs, hours worked at businesses reliant on low-wage labor tend to contract over six-quarter periods, both because of seasonality and the general slow growth of this economic sector in Seattle. This result is shown in **Figure 13**. Consistent with the results above, 2014-15 proved to be less negative than the historical average in Seattle. While this is also true to some extent in Synthetic Seattle, our basic estimate indicates that Seattle outperformed this comparison region. Also consistent with previous results, there is some sensitivity of this result across comparison groups.

**Figure 13: Change in Total Hours Worked at Single-Location Businesses Where Over 40% of Those Employed in 2<sup>nd</sup> Quarter of 2014 Earned <\$15 Per Hour**



A clear pattern appears when comparing our results for hours with our results for headcount. Our basic Seattle-versus-Synthetic-Seattle comparison indicates that headcount expanded 4.8% while hours expanded only 1.1%. A comparable pattern holds when considering other comparison regions. The clear implication here is that hours per person employed declined, an implication confirmed by our direct analysis of this measure. Hours per worker, which shows a tendency to expand over time in the historical record, grew more slowly than expected in Seattle but more rapidly than expected in each of the comparison regions. Relative to “business as usual” at these low-wage businesses and the 2015 experiences of comparison regions, we estimate that hours per employee declined between 7.5 and 9.9 over a quarter, or 35-40 minutes per week.

Again, this could be either a positive or negative development. We may observe fewer hours because more workers are switching jobs mid-quarter. It could also reflect cutbacks in hours per employee. It is important to remember that even though our basic employment estimates are

positive, they still occur in an environment where “business as usual” involves cutting back headcount.

Our worker-level analysis, which would not show a reduction in hours if an employee switched from one job to another mid-quarter while keeping the same hours, shows consistency with this pattern (see Section 4). Workers show some tendency to work fewer hours in the difference-in-difference analysis.

This analysis is subject to many limitations. Although we present estimates for a broader set of businesses in appendix tables, we are confident about workplace location for only a fraction of the Seattle workforce. Our focus on employment patterns in low-wage dependent businesses diverts attention from low-wage workers in businesses that employ a relatively small number of them. The seasonality of low-wage employment further complicates the analysis. And finally, our study of employment patterns six to nine months after the minimum wage rose on April 1 cannot reveal the longer-run consequences of the policy action.

### **Key findings**

- Overall, the Seattle labor market was exceptionally strong over the 18 months from mid-2014 to the end of 2015.
  - The City’s job growth rate tripled the national average.
  - The City’s job growth rate outpaced its robust performance in recent years.
  - Surrounding portions of King County also had a very good year; the boom appears to fade with geographic distance.
- There are mixed signals about the effect of the minimum wage on job opportunities for less-skilled workers.
  - The seasonality of low-wage work complicates the picture. Low-wage employers tend to contract towards the end of the calendar year.
  - Estimates of the impact of the minimum wage on the number of persistent jobs in businesses that rely heavily on low-wage labor are small and sensitive to choice of comparison region.
- Estimates of the impact of the minimum wage on hours per employee more consistently indicate a reduction.
  - At the level of an individual business, fewer hours per employee could reflect higher turnover rather than cutbacks in staffing.
  - These results are nonetheless consistent with the experiences of workers tracked longitudinally, as reported in the preceding section.

## 6. Impact of Seattle’s Minimum Wage Ordinance on Establishments

Our final analysis concerns establishments. A great concern among business leaders and labor representatives before the ordinance was passed was that the ordinance would lead to business closures or relocations out of the City of Seattle. We find only mild evidence to substantiate this concern, at least for the first 3 quarters after implementation as well as evidence of increased business openings

In **Table F 1**, we show that among Seattle’s single-location establishments that were open during the 2<sup>nd</sup> quarter of 2014, 17.8% had ceased to employ workers by the 4<sup>th</sup> quarter of 2015. While that sounds like a lot of closure, it is in fact less than the historical closure rate of 18.3%. Thus, Seattle’s closure rate *declined*, relative to expectation, by 0.5 percentage points. Synthetic Seattle had an even better improvement, lowering its business closure rate by 1.2 percentage points relative to expectation. Thus, the estimated impact of Seattle’s Minimum Wage Ordinance is a 0.7 percentage point increase in business closure rates. Repeating this analysis for single-location establishments that paid more than 40% of the workers less than \$15 per hour at baseline, we find a slightly larger negative impact of 1.0 percentage points.

Yet, this modest increase in business closure rates was more than offset by an increase in the rate of business openings. Among Seattle’s establishments that were open at the end of 2015, 21.6% of them were not open six quarters prior. This business openings rate compares favorably with Seattle’s historical rate of 20.7%; that is, Seattle experience a 0.95 percentage point increase in its business openings rate relative to expectations during this period. Moreover, this gain compares favorably with Synthetic Seattle, which only experienced a 0.05 percentage point increase in business openings rate relative to expectations. The net effect is an estimated 0.9 percentage point increase in business openings as a result of the Minimum Wage Ordinance.

This increase in both business closures *and* business openings perhaps should not come as a surprise. A higher minimum wage changes the type of business that can succeed profitably in Seattle, and we should thus expect some extra churning. Our results are consistent with those of Aaronson, French, and Sorkin (2016), who conclude that minimum wage laws prompt increases in both entries and exits (particularly in chains), with closures coming from more labor intensive industries and establishments, and more openings occurring in more capital intensive industries.

### Key findings:

- Seattle establishments closed less frequently than in prior years.
  - However, this improvement was not as strong as in comparison regions.
  - Our best estimate of the impact of the Seattle Minimum Wage Ordinance is a 0.7 percentage point increase in the rate of business closures.

- Seattle establishments opened more frequently than in prior years.
  - Moreover, this improvement was stronger than in comparison regions.
  - Our best estimate of the impact of the Seattle Minimum Wage Ordinance is a 0.9 percentage point increase in the rate of business openings.
- Combining these results, we can conclude that any increase in business closures induced by the Minimum Wage Ordinance was more than offset by a corresponding increase in business openings.



## 7. Conclusion and Discussion of Next Steps

The major conclusion one should draw from this analysis is that the Seattle Minimum Wage Ordinance worked as intended by raising the hourly wage rate of low-wage workers, yet the unintended, negative side effects on hours and employment muted the impact on labor earnings.

The Seattle economy (as well as comparison regions in the state of Washington) is booming, and this strong macroeconomy has led to improved outcomes for low-wage workers. Yet, our best estimates find that the Seattle Minimum Wage Ordinance appears to have lowered employment rates of low-wage workers. This negative unintended consequence (which are predicted by *some* of the existing economic literature) is concerning and needs to be followed closely in future years, because the long-run effects are likely to be greater as businesses and workers have more time to adapt to the ordinance. Finally, we find only modest impacts on earnings. The effects of disemployment appear to be roughly offsetting the gain in hourly wage rates, leaving the earnings for the average low-wage worker unchanged. Of course, we are talking about the average result.

More specifically, we find that median wages for low-wage workers (those earning less than \$11 per hour during the 2<sup>nd</sup> quarter of 2014) rose by \$1.18 per hour, and we estimate that the impact of the Ordinance was to increase these workers' median wage by \$0.73 per hour. Further, while these low-wage workers increased their likelihood of being employed relative to prior years, this increase was less than in comparison regions. We estimate that the impact of the Ordinance was a 1.1 percentage point *decrease* in likelihood of low-wage Seattle workers remaining employed. While these low-wage workers increased their quarterly earnings relative to prior years, the estimated impact of the Ordinance on earnings is small and sensitive to the choice of comparison region. Finally, for those who kept their job, the Ordinance appears to have improved wages and earnings, but decreased their likelihood of being employed in Seattle relative other parts of the state of Washington.

We find that Seattle employers closed less frequently than in prior years. Yet, this improvement was not as strong as in comparison regions. We estimate that the impact of the Ordinance was a 0.7 percentage point increase in the rate of business closures. However, Seattle establishments opened more frequently than in prior years, and we estimate that the impact of the Ordinance was a 0.9 percentage point increase in the rate of business openings. Thus, any effect of the Ordinance on business closures was more than offset by a corresponding increase in business openings.

We caution the reader to not interpret these results as likely to be generalizable to other cities nor to the state of Washington (whose legislature is currently considering raising the state's minimum wage). Seattle's strong economy may make it capable of absorbing higher wages for low-wage workers, and this capacity may not be present in other regions.

## Appendix A. The Employment Security Department Data

### Data elements

With limited exceptions, employers in the state of Washington are required to pay unemployment taxes on their employees' wages and submit tax and wage reports to the Employment Security Department (ESD) on a quarterly basis. Therefore, ESD acts as a hub of statewide employment information. Washington is one of only four states that also requires employers to report the number of hours worked by each employee.

Through a Data Sharing Agreement with WA State ESD, the Minimum Wage Study has access to quarterly employment data on individuals from the first quarter of 2000 through the last quarter of 2015.

### Data limitations

While the ESD data is an extremely valuable resource – it will enable the most comprehensive analysis of the minimum wage on individual and firm-level labor market outcomes ever conducted in the United States – it was designed for administrative use and not for research. As such, certain features of the data will place restrictions on our analysis.

1) *Jobs not covered by unemployment insurance program:* The ESD data provide information only on those jobs which are covered by Unemployment Insurance program. As explained by the Frequently Asked Questions for the Quarterly Census of Employment and Wages, which relies on the same data source as ESD, “major exclusions from U[n]employment I[n]surance coverage include self-employed workers, most agricultural workers on small farms, all members of the Armed Forces, elected officials in most states, most employees of railroads, some domestic workers, most student workers at schools, and employees of certain small nonprofit organizations.”<sup>15</sup>

2) *Retirement, dropping out of labor force and migration out of the state of Washington:* Since we observe only filled jobs in the state of Washington, we would not be able to distinguish between cases when a worker loses a job and becomes unemployed and cases when a worker separates from a job and moves to a different state in the U.S. or remains in the state of Washington, but drops out of labor force due to retirement, becoming a full-time student, inability to find a job etc. In our analysis, all these cases will look like reduction in employment. Similarly, the ESD data do not provide information on workers who joined the labor force, like young people looking for their first jobs, but never found a job. Because of this limitation, we focus our analysis on employment outcomes and do not study the impact of Minimum Wage on unemployment or easiness of finding a job.

3) *Working in informal sector:* Employment arrangements that are not reported to ESD, including both formal-sector jobs like 1099 contractor positions and informal sector jobs, cannot be incorporated into our analysis. Were the minimum wage to cause some firms to shift employment “under the table,” we would observe a reduction in employment. Such an event would cause reported income to decrease even though actual income might not.

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15 Source: <http://www.bls.gov/cew/cewfaq.htm#Q14>

4) While ESD data is supposed to include tips, there is a large degree of underreporting. It is theoretically unclear what effect the Minimum Wage Ordinance is likely to have on workers with tips. On the one hand, for employers moving from tips to service charges, reported income may increase more than actual income. However, if tips in general are underreported, and are a function of the size of a check, and prices went up, reported income may increase less than actual income.

5) *Multi-location establishments*: Some large employers with multiple locations in the state of Washington, such as retail or restaurant chains with company-owned stores, file a single quarterly report to cover employees at all locations. In our analysis, we will call an establishment a business which has a separate account with the ESD. For these establishments, we will not be able to observe any adjustments in headcount, payroll or hours across locations. Furthermore, we will not be able to determine what share of workers employed by these establishments is located in Seattle versus in other parts of the state of Washington. See additional discussion in Appendix C.

### Comparing ESD to other data sources

The ESD data provide details on jobs rather than employment, so a worker who transitioned from one jobs to another in a quarter will be counted twice in the data. To reduce the double counting of jobs, we follow the methodology of the Quarterly Workforce Indicators<sup>16</sup> and use beginning-of-quarter number of jobs as a measure of employment. Beginning-of-quarter number of jobs is calculated as the number of workers who were on payroll with an establishment in a current quarter and in the previous quarter. Beginning-of-quarter number of jobs can be thought of as a point-in-time estimate of the number of jobs, and is similar to employment count produced by Quarterly Census of Employment and Wages. However, the beginning-of-quarter number of jobs is likely to count multiple job holders twice.

In addition to this measure of employment, we also report the total headcount in quarter, which is calculated as the number of jobs on payroll in quarter in all establishments. This measure of jobs is higher than the beginning-of-quarter number of jobs, because it includes transitions between jobs and temporary jobs as well.

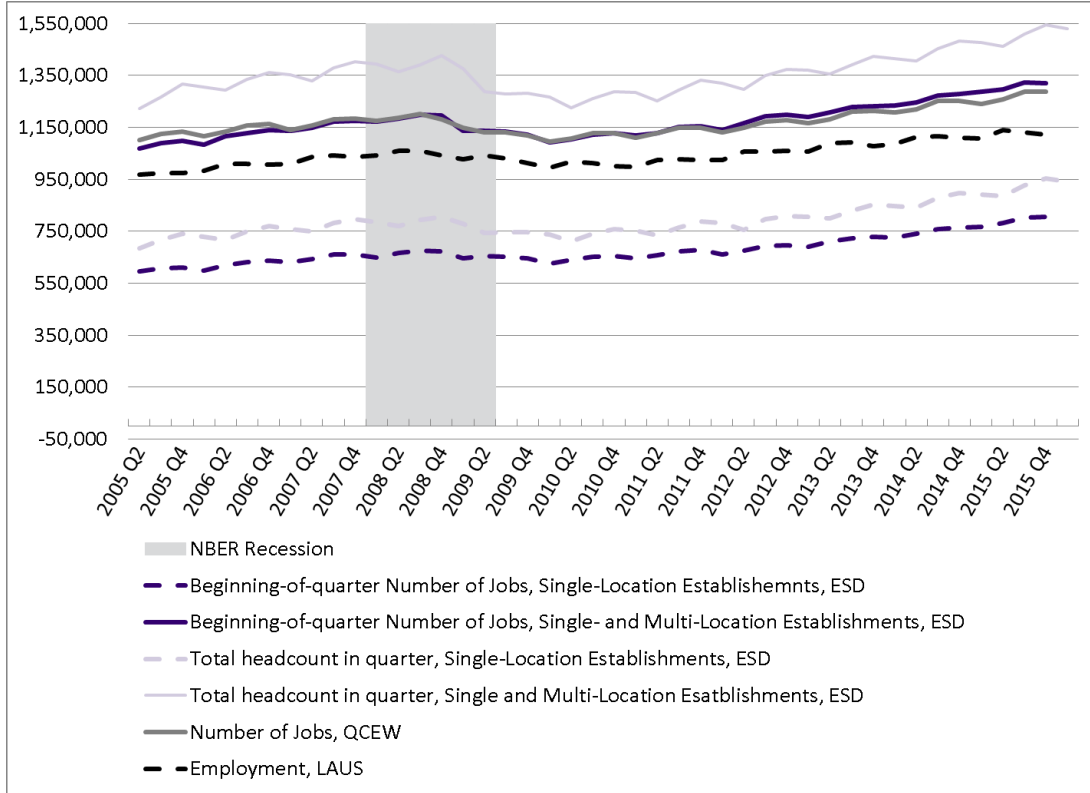
**Figure A 1** compares employment counts for King county using the data from the ESD, Quarterly Census of Employment and Wages (QCEW) and Local Area Unemployment Statistics produced by the Bureau of Labor Statistics based on the data from the Current Population Survey. It shows that both the beginning-of-quarter number of jobs and total headcount in quarter are larger (by 15% and by 30% respectively) than employment counts provided by LAUS. This discrepancy is explained by the multiple job holders and temporary jobs. However, beginning-of-quarter number of jobs in single and multi-location establishments is very close to the number of jobs reported by QCEW, which is the reason why it is our preferred measure of employment. Finally, **Figure A 1** also demonstrated that single-location establishments provide about 60% of jobs in

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16 [http://lehd.ces.census.gov/doc/QWI\\_101.pdf](http://lehd.ces.census.gov/doc/QWI_101.pdf)

King county. This number is even smaller for Seattle, where single-location establishments provide about 50% of jobs.

Figure A1: Comparison of Employment Counts in King County across Different Data Sources



## Appendix B: Detailed Discussion of Methodology

### Analysis timeline

Seattle's Minimum Wage Ordinance went into effect on April, 1st of 2015 (beginning of the second quarter of 2015). However, we start our analysis in the second quarter of 2014, when the ordinance was passed, and track outcomes for workers, jobs and establishments for six subsequent quarters until the fourth quarter of 2015, which is the last period for which data are currently available. This timeline allows us to evaluate if there was any adjustment in anticipation of the minimum wage increase, as well as to capture the impact of the ordinance after it went into effect.

### Measuring the impact of minimum wage

We consider the second quarter of 2014 our baseline, and calculate how much an outcome  $Y$  (for example, median hourly wage rate) in Seattle changed over six quarters (from the second quarter of 2014 to the fourth quarter of 2015), i.e. observable change in  $Y$  is  $\Delta Y_{Seattle, Year=2014} = Y_{Seattle, t=6} - Y_{Seattle, t=0}$ , where  $t$  denotes the number of quarters since baseline.

We separate this observable change into the contribution of three effects:

- *business as usual*, or the change in outcome over six quarters which we would expect if economic conditions or economic policy were not changing;
- *economic climate*, or an additional change in outcome over six quarters which occurs due to unusually good or bad economic conditions;
- *impact of minimum wage*, or an additional change in outcome over six quarters which cannot be explained either by the effect of business as usual or economic climate.

We measure business as usual change in outcome over six quarters as the historical change which was observed in Seattle in the prior years, before the ordinance went into effect. For each outcome and each year between 2005 and 2013, we calculate  $\Delta Y_{Seattle, Year} = Y_{Seattle, Year, t=6} - Y_{Seattle, Year, t=0}$  where  $t=0$  corresponds to the second quarter of each year, or the baseline quarter, and  $t=6$  corresponds to six quarters after that baseline quarter, or the fourth quarter of the subsequent year. Then, we define the historical change in 2005 to 2013 as the average observable change:  $\Delta Y_{Seattle, Historical} = 1/9 \times \sum \Delta Y_{Seattle, Year}$

To evaluate the contribution of the economic climate between the second quarter of 2014 and the fourth quarter of 2015, we calculate the difference between the observable change in outcome in comparison regions in the state of Washington, which did not experience an increase in minimum wage, and the historical change in outcome for that region:

$$\Delta Y_{Economic Climate in 2014} = \Delta Y_{Comparison Region, Year=2014} - \Delta Y_{Comparison Region, Historical}$$

Then we can isolate the impact of minimum wage in Seattle by calculating the difference-in-differences between the deviation of the change in outcome in Seattle from its historical average and the deviation of the change in outcome in comparison region from its historical average:

$$\begin{aligned} \Delta Y_{Seattle, Minimum Wage} &= (\Delta Y_{Seattle, Year=2014} - \Delta Y_{Seattle, Historical}) \\ &- (\Delta Y_{Comparison Region, Year=2014} - \Delta Y_{Comparison Region, Historical}) \\ &= \Delta Y_{Seattle, Year=2014} - \Delta Y_{Economic Climate in 2014} - \Delta Y_{Seattle, Historical} \end{aligned}$$

This difference-in-differences estimate will correctly estimate the impact of the Minimum Wage Ordinance on the outcome of interest if the contribution of economic climate between the second quarter of 2014 and the fourth quarter of 2015 was the same in Seattle and in comparison region.

### Comparison regions

We estimate how the outcomes in Seattle would have changed between the second quarter of 2014 and the fourth quarter of 2015 in the absence of the minimum wage increase by comparing Seattle to four regions:

- “Synthetic Seattle”, composed of ZIP codes in WA which demonstrated a similar trend to Seattle in the pre-policy years;
- “Synthetic Seattle excluding King county”, composed of ZIP codes in WA outside of King county which demonstrated a similar trend to Seattle in the pre-policy years.
- Snohomish, Pierce and Kitsap counties;
- King County excluding Seattle and SeaTac;

The latter two comparison regions have some advantages, namely by being geographies with known characteristics, it is easier to understand what is occurring in these regions. However, these regions may be experiencing trends in outcomes that differ from Seattle. Synthetic Seattle (including or excluding King County) has the advantage of matching Seattle levels and trends in outcomes, by construction.

**Figure B 1** through **Figure B 6** demonstrate that Synthetic Seattle’s “business as usual” pattern for the pre-policy cohorts tightly matches Seattle’s “business as usual” pattern for the pre-policy cohorts, and thus is a better comparison group than Snohomish, Pierce and Kitsap counties or King County excluding Seattle and SeaTac.

Figure B1: Historical Change in Median Hourly Wage Rate for Workers Employed by Single-Location Establishments at Baseline Quarter and Paid Less Than \$11 at Baseline Quarter

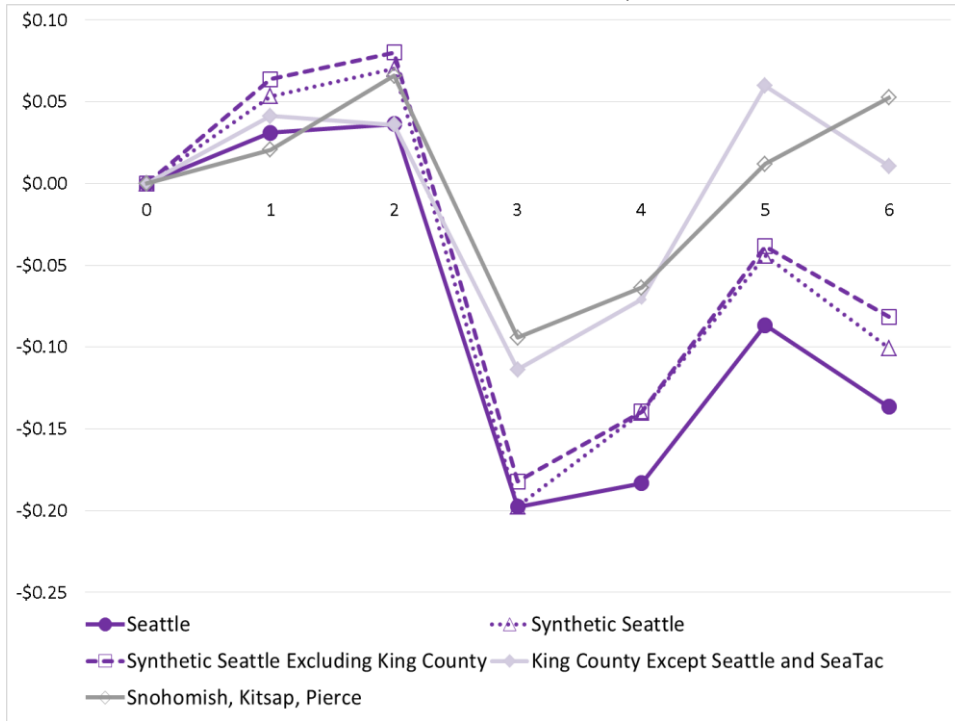


Figure B2: Historical Change in Percentage Employed for Workers Employed by Single-Location Establishments at Baseline Quarter and Paid Less Than \$11 at Baseline Quarter

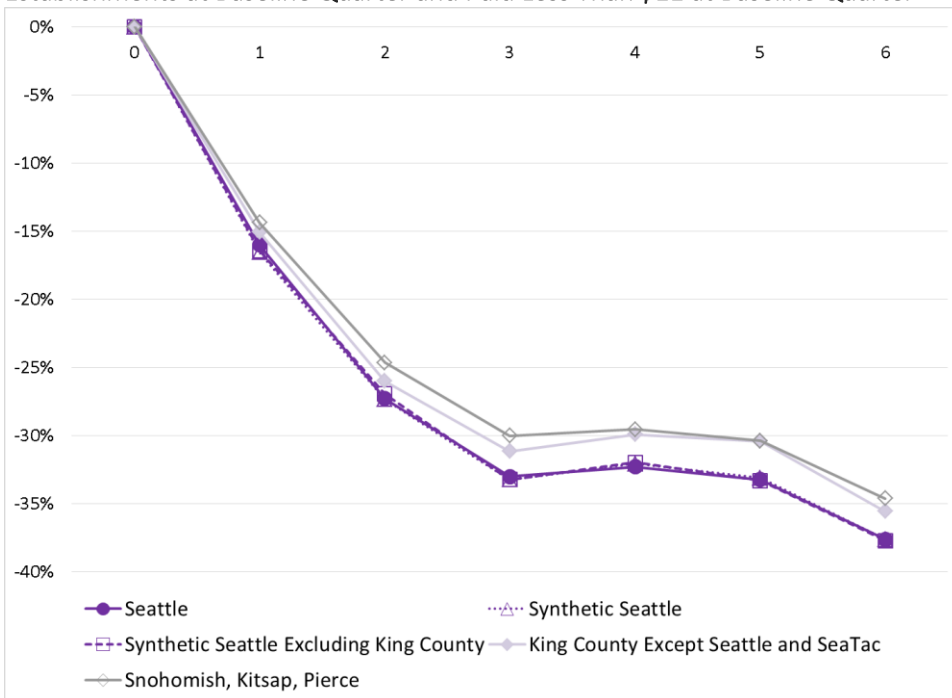


Figure B3: Historical Change in Mean Hours Worked for Workers Employed by Single-Location Establishments at Baseline Quarter and Paid Less Than \$11 at Baseline Quarter

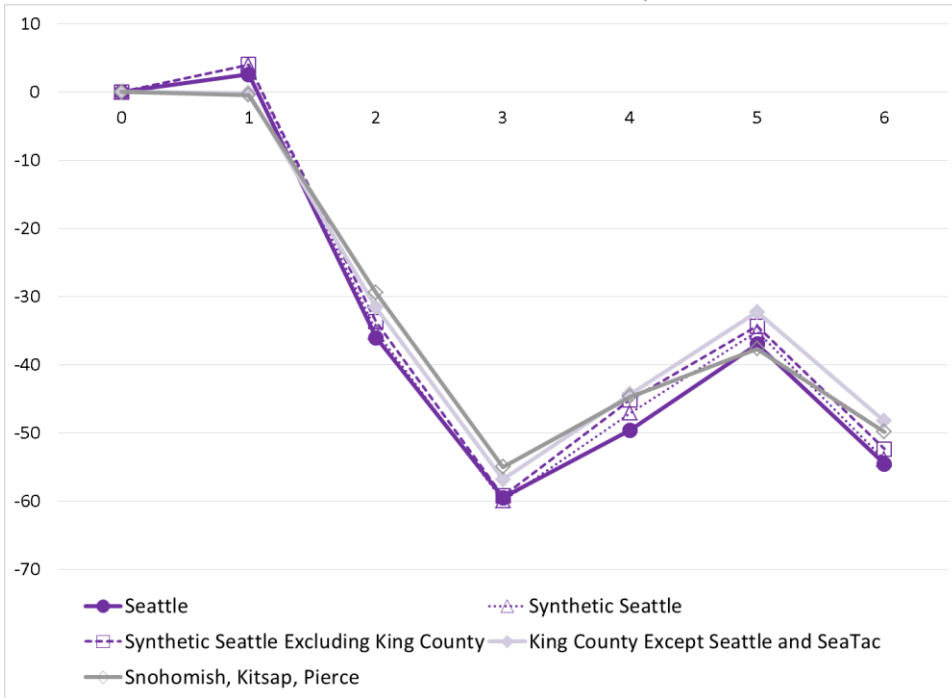


Figure B4: Historical Change in Median Earnings for Workers Employed by Single-Location Establishments at Baseline Quarter and Paid Less Than \$11 at Baseline Quarter

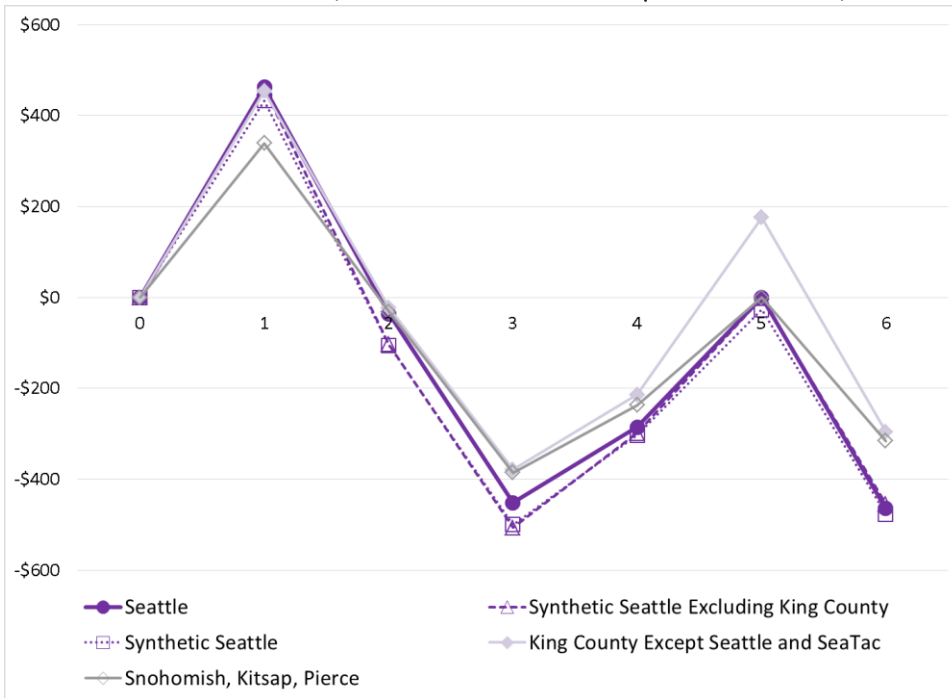




Figure B5: Historical Growth Rate of the Beginning-of-Quarter Number of Jobs , Single-Location Establishments with More than 40% of Workers Paid Less than \$15 in Baseline Quarter

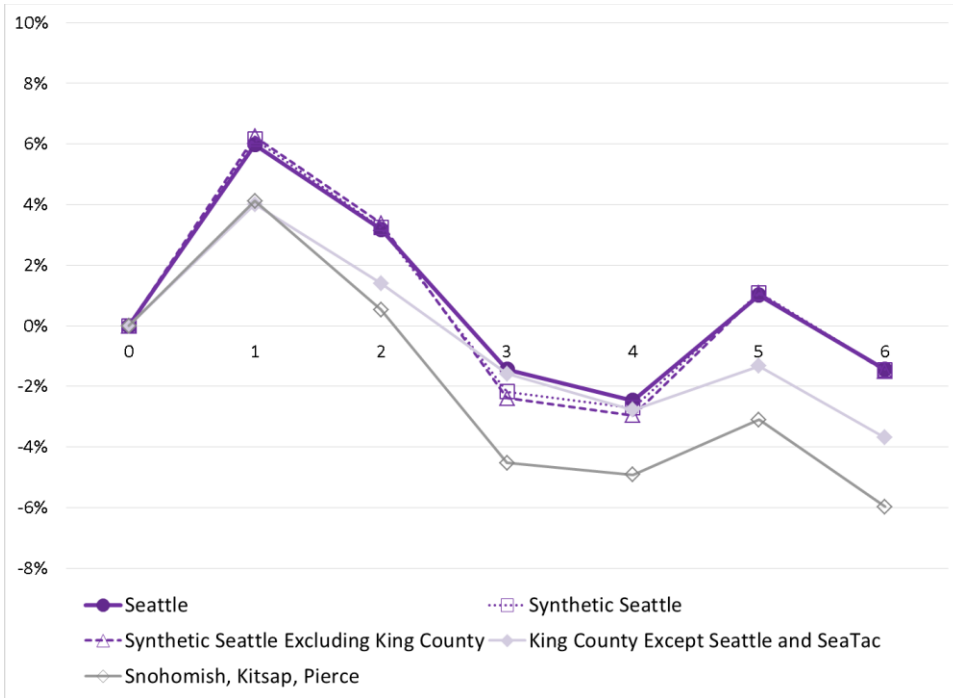


Figure B6: Historical Growth Rate of Total Headcount in Quarter, Single-Location Establishments with More than 40% of Workers Paid Less than \$15 in Baseline Quarter

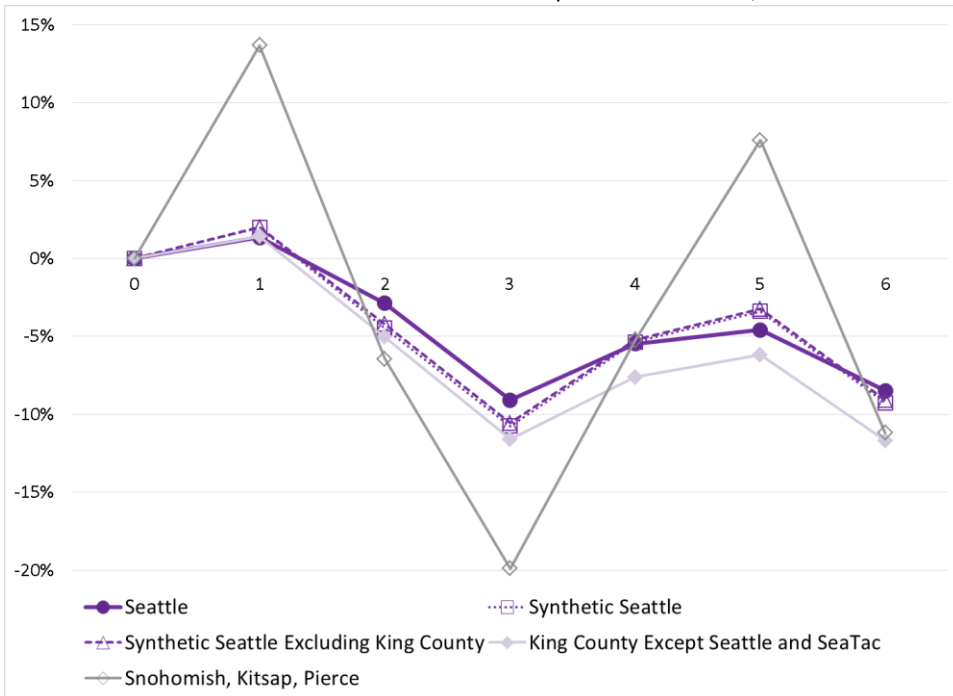


Figure B7: Historical Growth Rate of the Total Hours in Quarter, Single-Location Establishments with More than 40% of Workers Paid Less than \$15 in Baseline Quarter

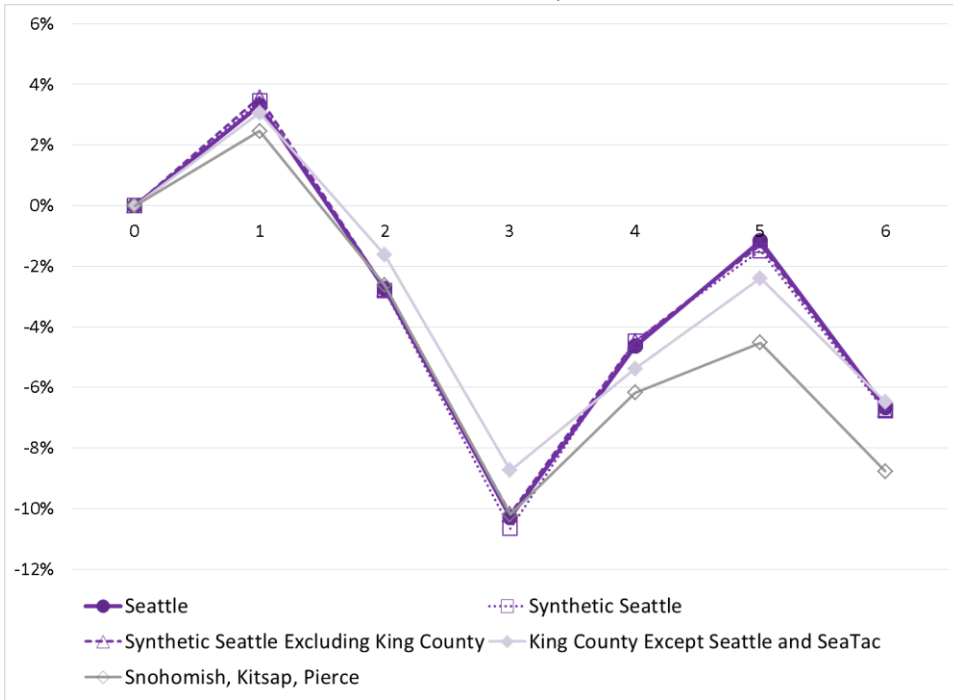
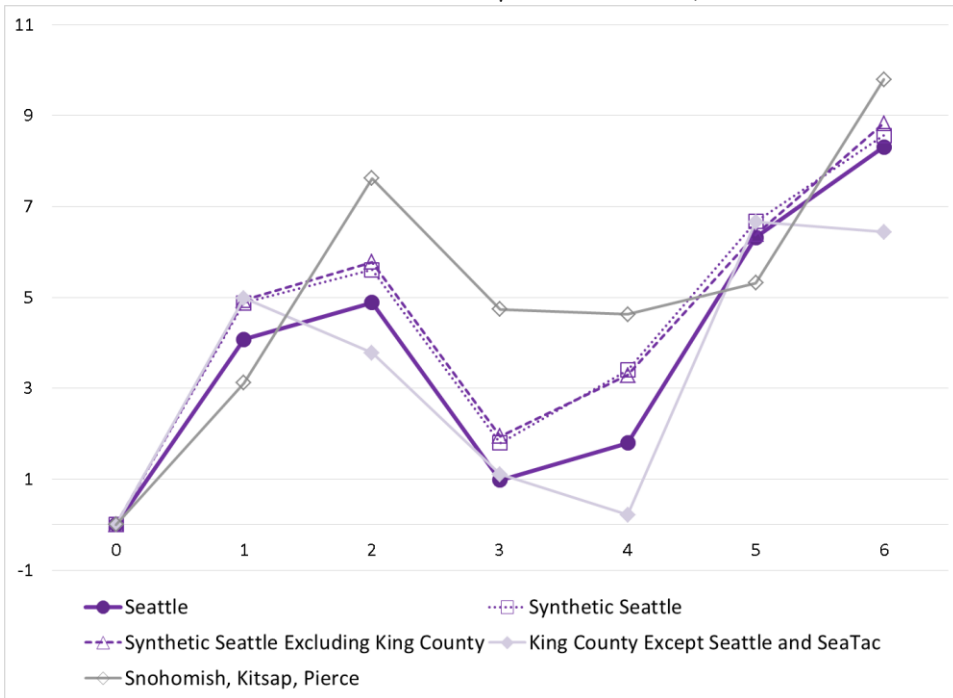


Figure B8: Historical Change in the Average Hours per Job, Single-Location Establishments with More than 40% of Workers Paid Less than \$15 in Baseline Quarter



## Synthetic Seattle

Because of our concern that the areas surrounding Seattle can exhibit different outcome levels and different growth trends than Seattle, which would prevent us from correctly estimating the contribution of the economic climate to changes in outcomes between the second quarter of 2014 and fourth quarter of 2015, we construct a “Synthetic Seattle” from ZIP codes in WA which demonstrate the same outcome levels and trends as Seattle in the pre-policy years (2005 – 2013).

We use the following procedure to find such ZIP codes.

Step 1:

For each zip code  $i$  (excluding those in SeaTac), compute the deviation from Seattle as follows:

$$\begin{aligned} & (Y_{Seattle,t=0,Year=2005} - Y_{i,t=0,Cohort=2005})^2 + \dots \\ & + (Y_{Seattle,t=6,Year=2005} - Y_{i,t=6,Cohort=2005})^2 \\ & + (Y_{Seattle,t=0,Year=2006} - Y_{i,t=0,Cohort=2006})^2 + \dots \\ & + (Y_{Seattle,t=6,Year=2006} - Y_{i,t=6,Cohort=2006})^2 + \dots \\ & (Y_{Seattle,t=0,Year=2013} - Y_{i,t=0,Cohort=2013})^2 + \dots \\ & + (Y_{Seattle,t=6,Year=2013} - Y_{i,t=6,Cohort=2013})^2 \end{aligned}$$

Step 2:

Identify the zip code with the smallest deviation from Seattle for Step 1. This ZIP code will be included in Synthetic Seattle.

Step 3:

Repeat Step 1, but replace  $Y_i$  with a weighted average of  $Y_i$  and  $Y$  for the zip code included in Synthetic Seattle, where the weight is the number of workers at baseline quarter in each ZIP code for workers’ outcomes or the number of beginning-of-quarter jobs at baseline quarter in each ZIP code for job’s outcomes.

Step 4:

Identify the ZIP code with the smallest deviation to Seattle for Step 3. Add this ZIP code into Synthetic Seattle and compute the weighted average  $Y$  for the zip codes in Synthetic Seattle.

Step 5:

Repeat Steps 3 and 4 until there are at least as many workers (or at least as many jobs) in Synthetic Seattle as there are in Seattle at baseline quarter.

## Appendix C: Geographic Attribution of Establishments

In this appendix we describe data limitations which can lead to incorrect attribution of a job as covered by Seattle’s Minimum Wage Ordinance when it is not (and vice versa), and discuss how the analysis addresses these data limitations.

### Multi-location establishments

Some large employers with multiple locations in the state of Washington, such as retail or restaurant chains with company-owned stores, file a single quarterly report to cover employees at all locations. This quarterly report may list a single location, such as a corporate headquarters, in the address field and not provide any method of ascertaining whether a specific employee worked at a Seattle location. The single address may be in Seattle or elsewhere. An ESD file exists that breaks out, for some employers, the aggregate headcount/payroll by location, however we do not have access to this file. Moreover, the aggregate statistics will not reveal the hourly wages or quarterly earnings for individual employees.

If the effects of the Minimum Wage Ordinance are comparable in single-location establishments and multi-location firms, then including multi-location firms introduces a form of bias – known as attenuation bias – meaning that our analysis will tend to underestimate the magnitude of minimum wage effects. This bias emerges because some “treated” units are erroneously counted in the “control group”, and vice-versa, thereby reducing the differences between the observed treatment and control groups. In our baseline analysis we focus on single-location establishments for which we can determine with certainty if they are subject to the ordinance. About 70% of employer accounts which listed a street address in Seattle in ESD data belong to single-location establishments, and these establishments employ on average 50% of the workforce in Seattle.

However, because single-location establishments are likely to be smaller and younger than multi-location establishments, they might experience a different impact of an increase in minimum wage. To alleviate this concern, we repeat our analysis on the sample of all establishments in Seattle, attributing all establishments which listed their street address in Seattle as covered by ordinance, even if their street address is a headquarters address rather than the physical location of a business. Since the analysis based on the sample of all establishments suffers from potential incorrect attribution of a job as covered by the ordinance, it will underestimate the impact of the ordinance.

### Outsourcing payroll

The address of record in ESD files may not be the location where employees work, even for a single-location establishment. This could occur, for example, if a company “outsources” the ESD filing to a payroll processing company. To check how common this might be, we checked the data for instances of multiple companies filing reports with the exact same mailing address. The vast majority of single-location establishments report from either a unique addresses or addresses shared with a small number of other companies. Nonetheless, there are instances of many companies reporting from the same address. To minimize instances when the listed address belong to a payroll processing company, we exclude from the analysis employer accounts which

list an address with 20 or more account listed at the same address in the same quarter. This excluded from the analysis 6.7% of jobs in Seattle.

### **Identifying establishments located in Seattle**

Even though all businesses report their street address to ESD, identifying business location on the basis of address is not always straightforward. Many locations outside Seattle (Shoreline, White Center, Bryn Mawr-Skyway, Tukwila, Burien, etc.) may list themselves as having a Seattle mailing address – in many cases, the USPS recommends that they do so – though they are not subject to the Seattle Minimum Wage Ordinance. To avoid classifying such businesses as covered by the ordinance, we use ZIP code information to more accurately determine which employers are in Seattle. However, some ZIP codes straddle the city limits. To determine if establishments located in such ZIP codes are subject to the ordinance, we geocode street addresses which these establishments reported to ESD. Together, these two procedures allow us to determine precise location of 93.5% of jobs in King County. The remaining 7.5% of jobs in King County are in establishments which are located in ZIP codes which straddle Seattle boundaries, and provided an incomplete street address that cannot be geocoded. Since we cannot determine with certainty if these establishments are covered by Seattle’s Minimum Wage Law, we exclude them from our baseline analysis. However, we included these establishments into the analysis which covers both single-location establishments and multi-location firms.

## Appendix D: Tables for Impact on Low-Wage Workers

Table D1: Workers Employed By Single-Location Establishments with Hourly Wage Rate Less Than \$11 at Baseline in Seattle and in Comparison Regions

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014		2015		Difference - in - Differences Between Seattle and Comparison Region	
			Q2	Q4	Q2	Q4	Change Over Six Quarters	Historical Change Over Six Quarters
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>								
Median Hourly Wage Rate	Seattle	26,881	\$9.96	\$11.14	\$1.18	-\$0.14	\$1.32	
	Synthetic Seattle	27,005	\$9.95	\$10.44	\$0.49	-\$0.10	\$0.59	\$0.73
	Synthetic Seattle Excluding King County	27,234	\$9.94	\$10.45	\$0.51	-\$0.08	\$0.59	\$0.73
	Snohomish, Kitsap, Pierce Counties	57,710	\$9.92	\$10.45	\$0.53	\$0.05	\$0.48	\$0.84
	King County Except Seattle and SeaTac	47,853	\$9.92	\$10.55	\$0.63	\$0.01	\$0.62	\$0.70
Share Employed	Seattle	26,881	100%	64.98%	-35.02%	-37.59%	2.57%	
	Synthetic Seattle	27,094	100%	66.15%	-33.85%	-37.60%	3.75%	-1.17%
	Synthetic Seattle Excluding King County	27,351	100%	66.20%	-33.81%	-37.69%	3.88%	-1.31%
	Snohomish, Kitsap, Pierce Counties	57,710	100%	68.85%	-31.15%	-34.60%	3.46%	-0.89%
	King Except Seattle and SeaTac	47,853	100%	67.36%	-32.64%	-35.55%	2.91%	-0.34%
Mean Hours Worked	Seattle	26,881	276.2	233.9	-42.3	-54.5	12.2	
	Synthetic Seattle	26,944	281.0	243.5	-37.6	-53.9	16.4	-4.1
	Synthetic Seattle Excluding King County	27,214	284.1	244.7	-39.4	-52.4	13.0	-0.7
	Snohomish, Kitsap, Pierce	57,710	283.9	255.5	-28.4	-49.9	21.5	-9.2
	King County Except Seattle and SeaTac	47,853	279.7	253.9	-25.8	-48.3	22.5	-10.2
Median Quarterly Earnings	Seattle	\$26,881	\$1,995	\$1,994	-0.69	-464.06	463.37	
	Synthetic Seattle	\$26,953	\$2,240	\$2,154	-85.76	-477.13	391.37	72.01
	Synthetic Seattle Excluding King County	\$27,019	\$2,261	\$2,160	-101.23	-454.33	353.10	110.28
	Snohomish, Kitsap, Pierce Counties	\$57,710	\$2,379	\$2,559	179.31	-315.66	494.97	-31.60
	King County Except Seattle and SeaTac	\$47,853	\$2,196	\$2,431	235.59	-295.67	531.25	-67.88
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>								
Median Hourly Wage Rate	Seattle	17,468	\$9.96	\$12.19	\$2.23	\$1.20	\$1.03	
	Synthetic Seattle	17,497	\$9.98	\$11.91	\$1.93	\$1.21	\$0.72	\$0.31
	Synthetic Seattle Excluding King County	17,985	\$9.97	\$11.83	\$1.86	\$1.22	\$0.64	\$0.39
	Snohomish, Kitsap, Pierce Counties	39,736	\$9.95	\$11.72	\$1.77	\$1.14	\$0.64	\$0.39
	King County Except Seattle and SeaTac	32,234	\$9.95	\$11.95	\$2.00	\$1.19	\$0.81	\$0.22
Mean Hours Worked	Seattle	17,468	308.4	359.9	51.5	44.5	7.0	
	Synthetic Seattle	17,621	323.3	372.9	49.6	39.4	10.2	-3.2
	Synthetic Seattle Excluding King County	17,587	317.2	371.6	54.4	39.9	14.5	-7.4
	Snohomish, Kitsap, Pierce Counties	39,736	312.0	371.0	59.0	38.7	20.4	-13.4
	King County Except Seattle and SeaTac	32,234	311.6	376.9	65.3	42.8	22.5	-15.5
Median Quarterly Earnings	Seattle	17,468	\$2,524	\$4,559	\$2,035	\$1,493	\$542	
	Synthetic Seattle	17,975	\$2,735	\$4,482	\$1,747	\$1,369	\$378	\$164
	Synthetic Seattle Excluding King County	17,532	\$2,839	\$4,438	\$1,599	\$1,296	\$303	\$239
	Snohomish, Kitsap, Pierce Counties	39,736	\$2,807	\$4,503	\$1,696	\$1,299	\$398	\$144
	King County Except Seattle and SeaTac	32,234	\$2,728	\$4,640	\$1,912	\$1,482	\$431	\$111
Share Who Remain in the Same Region	Seattle	17,468	100%	70.09%	-29.91%	-26.57%	-3.33%	
	Snohomish, Kitsap, Pierce Counties	39,736	100%	74.63%	-25.37%	-24.85%	-0.53%	-2.81%
	King County Except Seattle and SeaTac	32,234	100%	68.15%	-31.85%	-29.24%	-2.61%	-0.72%

**Table D2: Workers Employed By Single-Location Establishments with Hourly Wage Rate \$11 - \$13 at Baseline in Seattle and in Comparison Regions**

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014 Q2		2015 Q4		Change Over Six Quarters	Historical Change Over Six Quarters	Difference - in - Differences Between Seattle and Comparison Region
			2014 Q2	2015 Q4	2014 Q2	2015 Q4			
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>									
Median Hourly Wage Rate	Seattle	20270	\$11.97	\$13.07	\$1.10	\$0.07	\$1.03		
	Synthetic Seattle	20727	\$11.99	\$12.86	\$0.88	\$0.07	\$0.80	\$0.22	
	Synthetic Seattle Excluding King County	20407	\$11.99	\$12.70	\$0.71	\$0.08	\$0.63	\$0.39	
	Snohomish, Kitsap, Pierce Counties	35783	\$11.96	\$12.91	\$0.95	\$0.08	\$0.87	\$0.16	
	King County Except Seattle and SeaTac	32316	\$11.98	\$13.09	\$1.11	\$0.12	\$1.00	\$0.03	
Share Employed	Seattle	20270	100%	73.49%	-26.51%	-28.55%	2.04%		
	Synthetic Seattle	20328	100%	73.48%	-26.52%	-28.65%	2.14%	-0.10%	
	Synthetic Seattle Excluding King County	20634	100%	73.03%	-26.97%	-28.65%	1.68%	0.36%	
	Snohomish, Kitsap, Pierce Counties	35783	100%	75.89%	-24.11%	-26.62%	2.51%	-0.47%	
	King County Except Seattle and SeaTac	32316	100%	75.83%	-24.17%	-27.00%	2.83%	-0.79%	
Mean Hours Worked	Seattle	20270	358.09	309.31	-48.79	-55.50	6.71		
	Synthetic Seattle	20370	357.31	303.52	-53.78	-57.16	3.38	3.33	
	Synthetic Seattle Excluding King County	20325	359.56	300.37	-59.19	-59.79	0.61	6.11	
	Snohomish, Kitsap, Pierce	35783	371.21	323.30	-47.91	-66.65	18.74	-12.03	
	King County Except Seattle and SeaTac	32316	368.39	328.79	-39.60	-59.39	19.80	-13.08	
Median Quarterly Earnings	Seattle	20270	\$4,569.03	\$4,852.96	\$283.94	-\$349.27	\$633.21		
	Synthetic Seattle	20316	\$4,504.42	\$4,777.39	\$272.97	-\$383.09	\$656.06	-\$22.85	
	Synthetic Seattle Excluding King County	20295	\$4,593.14	\$4,672.01	\$78.86	-\$454.03	\$532.89	\$100.31	
	Snohomish, Kitsap, Pierce Counties	35783	\$4,750.93	\$5,004.25	\$253.32	-\$471.10	\$724.42	-\$91.21	
	King County Except Seattle and SeaTac	32316	\$4,742.78	\$5,196.67	\$453.88	-\$312.22	\$766.11	-\$132.90	
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>									
Median Hourly Wage Rate	Seattle	14896	\$11.99	\$14.18	\$2.19	\$1.09	\$1.10		
	Synthetic Seattle	14976	\$11.99	\$13.94	\$1.95	\$1.09	\$0.85	\$0.25	
	Synthetic Seattle Excluding King County	16203	\$12.00	\$13.87	\$1.87	\$1.08	\$0.79	\$0.31	
	Snohomish, Kitsap, Pierce Counties	27157	\$11.96	\$13.81	\$1.85	\$0.99	\$0.86	\$0.24	
	King County Except Seattle and SeaTac	24506	\$11.99	\$14.05	\$2.07	\$1.01	\$1.05	\$0.05	
Mean Hours Worked	Seattle	14896	387.69	420.89	33.21	27.99	5.22		
	Synthetic Seattle	14911	384.69	415.06	30.37	23.96	6.41	-1.20	
	Synthetic Seattle Excluding King County	14931	388.91	413.80	24.89	19.00	5.89	-0.68	
	Snohomish, Kitsap, Pierce Counties	27157	397.25	426.00	28.74	11.67	17.08	-11.86	
	King County Except Seattle and SeaTac	24506	397.57	433.57	36.00	21.24	14.76	-9.54	
Median Quarterly Earnings	Seattle	14896	\$5,060.47	\$6,617.52	\$1,557.05	\$1,049.69	\$507.36		
	Synthetic Seattle	15093	\$4,939.59	\$6,400.59	\$1,461.00	\$964.35	\$496.65	\$10.70	
	Synthetic Seattle Excluding King County	15709	\$5,016.78	\$6,347.20	\$1,330.42	\$870.64	\$459.78	\$47.58	
	Snohomish, Kitsap, Pierce Counties	27157	\$5,103.02	\$6,389.87	\$1,286.84	\$715.46	\$571.38	-\$64.02	
	King County Except Seattle and SeaTac	24506	\$5,190.59	\$6,677.49	\$1,486.90	\$878.25	\$608.65	-\$101.29	
Share Who Remain in the Same Region	Seattle	14896	100%	76.48%	-23.52%	-21.08%	-2.43%		
	Snohomish, Kitsap, Pierce Counties	27157	100%	79.71%	-20.29%	-18.57%	-1.72%	-0.71%	
	King County Except Seattle and SeaTac	24506	100%	75.35%	-24.65%	-22.23%	-2.42%	-0.02%	

**Table D3: Workers Employed By Single-Location Establishments with Hourly Wage Rate \$13 - \$15 at Baseline in Seattle and in Comparison Regions**

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014		2015		Difference - in - Differences Between Seattle and Comparison Region	
			Q2	Q4	Q2	Q4	Difference	Differences Between Seattle and Comparison Region
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>								
Median Hourly Wage Rate	Seattle	20,549	\$14.07	\$15.23	\$1.15	\$0.30	\$0.85	
	Synthetic Seattle	20,835	\$14.05	\$14.82	\$0.78	\$0.31	\$0.47	\$0.38
	Synthetic Seattle Excluding King County	20,814	\$14.03	\$14.77	\$0.74	\$0.30	\$0.44	\$0.41
	Snohomish, Kitsap, Pierce Counties	32,867	\$14.02	\$15.12	\$1.11	\$0.13	\$0.98	-\$0.13
	King County Except Seattle and SeaTac	33,515	\$14.07	\$15.22	\$1.15	\$0.20	\$0.95	-\$0.10
Share Employed	Seattle	20,549	100%	77.13%	-22.87%	-24.35%	1.48%	
	Synthetic Seattle	20,839	100%	77.07%	-22.93%	-24.37%	1.44%	0.04%
	Synthetic Seattle Excluding King County	20,573	100%	76.65%	-23.35%	-24.30%	0.95%	0.53%
	Snohomish, Kitsap, Pierce Counties	32,867	100%	78.88%	-21.12%	-22.38%	1.26%	0.22%
	King Except Seattle and SeaTac	33,515	100%	79.40%	-20.60%	-22.42%	1.82%	-0.34%
Mean Hours Worked	Seattle	20,549	400.5	345.9	-54.6	-67.6	13.1	
	Synthetic Seattle	20,873	407.3	345.5	-61.8	-68.0	6.2	6.8
	Synthetic Seattle Excluding King County	20,645	407.5	343.7	-63.8	-68.9	5.1	8.0
	Snohomish, Kitsap, Pierce	32,867	403.3	353.7	-49.6	-70.5	21.0	-7.9
	King County Except Seattle and SeaTac	33,515	401.3	358.0	-43.4	-63.8	20.4	-7.3
Median Quarterly Earnings	Seattle	\$20,549	\$6,314	\$6,829	\$515	-\$259.58	\$774.49	
	Synthetic Seattle	\$20,807	\$6,382	\$6,592	\$210	-\$263.64	\$473.15	\$301.34
	Synthetic Seattle Excluding King County	\$21,873	\$6,391	\$6,586	\$194	-\$276.17	\$470.62	\$303.87
	Snohomish, Kitsap, Pierce Counties	\$32,867	\$6,217	\$6,476	\$259	-\$489.45	\$748.35	\$26.13
	King County Except Seattle and SeaTac	\$33,515	\$6,276	\$6,762	\$486	-\$399.34	\$885.17	-\$110.68
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>								
Median Hourly Wage Rate	Seattle	17,468	\$9.96	\$12.19	\$2.23	\$1.20	\$1.03	
	Synthetic Seattle	17,497	\$9.98	\$11.91	\$1.93	\$1.21	\$0.72	\$0.31
	Synthetic Seattle Excluding King County	17,985	\$9.97	\$11.83	\$1.86	\$1.22	\$0.64	\$0.39
	Snohomish, Kitsap, Pierce Counties	32,234	\$9.95	\$11.95	\$2.00	\$1.19	\$0.81	\$0.22
	King County Except Seattle and SeaTac	39,736	\$9.95	\$11.72	\$1.77	\$1.14	\$0.64	\$0.39
Mean Hours Worked	Seattle	17,468	308.4	359.9	51.5	44.5	7.0	
	Synthetic Seattle	17,621	323.3	372.9	49.6	39.4	10.2	-3.2
	Synthetic Seattle Excluding King County	17,587	317.2	371.6	54.4	39.9	14.5	-7.4
	Snohomish, Kitsap, Pierce Counties	32,234	311.6	376.9	65.3	42.8	22.5	-15.5
	King County Except Seattle and SeaTac	39,736	312.0	371.0	59.0	38.7	20.4	-13.4
Median Quarterly Earnings	Seattle	17,468	\$2,524	\$4,559	\$2,035	\$1,493	\$542	
	Synthetic Seattle	17,975	\$2,735	\$4,482	\$1,747	\$1,369	\$378	\$164
	Synthetic Seattle Excluding King County	17,532	\$2,839	\$4,438	\$1,599	\$1,296	\$303	\$239
	Snohomish, Kitsap, Pierce Counties	32,234	\$2,728	\$4,640	\$1,912	\$1,482	\$431	\$111
	King County Except Seattle and SeaTac	39,736	\$2,807	\$4,503	\$1,696	\$1,299	\$398	\$144
Share Who Remain in the Same Region	Seattle	17,468	100%	70.09%	-29.91%	-26.57%	-3.33%	
	Snohomish, Kitsap, Pierce Counties	32,234	100%	68.15%	-31.85%	-29.24%	-2.61%	-0.72%
	King County Except Seattle and SeaTac	39,736	100%	74.63%	-25.37%	-24.85%	-0.53%	-2.81%



**Table D4: Workers Employed By Single-Location Establishments with Hourly Wage Rate \$15 - \$18 at Baseline in Seattle and in Comparison Regions**

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014 Q2		2015 Q4		Change Over Six Quarters	Historical Change Over Six Quarters	Difference - in - Differences Between Seattle and Comparison Region
			2014 Q2	2015 Q4	2014 Q2	2015 Q4			
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>									
Median Hourly Wage Rate	Seattle	27,963	\$16.51	\$17.91	\$1.39	\$0.43	\$0.96		
	Synthetic Seattle	28,027	\$16.51	\$17.63	\$1.12	\$0.43	\$0.68	\$0.27	
	Synthetic Seattle Excluding King County	28,999	\$16.53	\$17.59	\$1.06	\$0.43	\$0.63	\$0.33	
	Snohomish, Kitsap, Pierce Counties	42,886	\$16.49	\$17.59	\$1.10	\$0.22	\$0.88	\$0.08	
	King County Except Seattle and SeaTac	45,385	\$16.47	\$17.73	\$1.26	\$0.31	\$0.96	\$0.00	
Share Employed	Seattle	27,963	100%	79.58%	-20.42%	-21.76%	1.34%		
	Synthetic Seattle	28,020	100%	80.10%	-19.90%	-21.69%	1.80%	-0.45%	
	Synthetic Seattle Excluding King County	28,089	100%	78.90%	-21.10%	-21.73%	0.63%	0.71%	
	Snohomish, Kitsap, Pierce Counties	42,886	100%	82.08%	-17.92%	-19.51%	1.59%	-0.24%	
	King Except Seattle and SeaTac	45,385	100%	82.10%	-17.90%	-19.44%	1.55%	-0.21%	
Mean Hours Worked	Seattle	27,963	433.5	369.0	-64.5	-71.7	7.2		
	Synthetic Seattle	28,595	433.7	366.5	-67.2	-71.4	4.2	3.0	
	Synthetic Seattle Excluding King County	28,467	433.2	361.0	-72.1	-72.8	0.7	6.6	
	Snohomish, Kitsap, Pierce	42,886	437.8	381.8	-55.9	-70.0	14.1	-6.9	
	King County Except Seattle and SeaTac	45,385	436.7	385.4	-51.2	-66.6	15.4	-8.2	
Median Quarterly Earnings	Seattle	\$27,963	\$7,966	\$8,598	\$632.76	-\$53.54	\$686.30		
	Synthetic Seattle	\$30,973	\$7,926	\$8,491	\$564.84	-\$71.14	\$635.98	\$50.32	
	Synthetic Seattle Excluding King County	\$28,010	\$7,931	\$8,361	\$429.85	-\$91.36	\$521.21	\$165.09	
	Snohomish, Kitsap, Pierce Counties	\$42,886	\$7,832	\$8,399	\$566.84	-\$338.69	\$905.53	-\$219.23	
	King County Except Seattle and SeaTac	\$45,385	\$7,874	\$8,668	\$793.52	-\$179.71	\$973.24	-\$286.94	
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>									
Median Hourly Wage Rate	Seattle	15,850	\$14.05	\$16.05	\$2.00	\$1.15	\$0.85		
	Synthetic Seattle	15,858	\$14.04	\$15.92	\$1.88	\$1.15	\$0.74	\$0.11	
	Synthetic Seattle Excluding King County	16,345	\$14.03	\$15.90	\$1.86	\$1.13	\$0.73	\$0.12	
	Snohomish, Kitsap, Pierce Counties	25,926	\$14.01	\$15.67	\$1.67	\$0.89	\$0.77	\$0.08	
	King County Except Seattle and SeaTac	26,611	\$14.06	\$15.90	\$1.84	\$0.96	\$0.88	-\$0.03	
Mean Hours Worked	Seattle	15,850	427.8	448.5	20.7	10.4	10.3		
	Synthetic Seattle	16,415	435.4	451.2	15.7	6.7	9	1.3	
	Synthetic Seattle Excluding King County	15,919	443.2	450.4	7.2	4.6	2.7	7.6	
	Snohomish, Kitsap, Pierce Counties	25,926	427.7	448.4	20.8	0.8	19.9	-9.6	
	King County Except Seattle and SeaTac	26,611	425.5	450.8	25.3	8.8	16.5	-6.2	
Median Quarterly Earnings	Seattle	15,850	\$6,580	\$7,994	\$1,414	\$752	\$662		
	Synthetic Seattle	16,159	\$6,627	\$7,899	\$1,272	\$717	\$555	\$107	
	Synthetic Seattle Excluding King County	15,852	\$6,654	\$7,895	\$1,240	\$686	\$555	\$107	
	Snohomish, Kitsap, Pierce Counties	25,926	\$6,485	\$7,722	\$1,237	\$514	\$723	-\$61	
	King County Except Seattle and SeaTac	26,611	\$6,542	\$7,963	\$1,420	\$637	\$784	-\$122	
Share Who Remain in the Same Region	Seattle	15,850	100%	78.41%	-21.59%	-18.86%	-2.73%		
	Snohomish, Kitsap, Pierce Counties	25,926	100%	83.14%	-16.86%	-15.40%	-1.46%	-1.27%	
	King County Except Seattle and SeaTac	26,611	100%	79.52%	-20.48%	-18.59%	-1.89%	-0.83%	

**Table D5: Workers Employed By Single- Location Establishments and Multi-Location Firms with Hourly Wage Rate Less Than \$11 at Baseline in Seattle and in Comparison Regions**

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014		2015		Difference - in - Differences Between Seattle and Comparison Region	
			Q2	Q4	Q2	Q4	Change Over Six Quarters	Historical Change Over Six Quarters
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>								
Median Hourly Wage Rate	Seattle	49,872	\$9.96	\$11.14	\$1.18	\$0.06	\$1.13	
	Synthetic Seattle	51,090	\$9.96	\$10.76	\$0.80	\$0.09	\$0.71	\$0.42
	Synthetic Seattle Excluding King County	50,925	\$9.92	\$10.56	\$0.64	\$0.10	\$0.54	\$0.58
	Snohomish, Kitsap, Pierce Counties	78,213	\$9.87	\$10.65	\$0.78	\$0.10	\$0.68	\$0.45
	King County Except Seattle and SeaTac	93,697	\$9.78	\$10.52	\$0.75	\$0.11	\$0.64	\$0.49
Share Employed	Seattle	49,872	100%	67.46%	-32.54%	-35.14%	2.60%	
	Synthetic Seattle	51,053	100%	67.76%	-32.24%	-35.22%	2.98%	-0.38%
	Synthetic Seattle Excluding King County	49,956	100%	67.44%	-32.56%	-35.21%	2.66%	-0.06%
	Snohomish, Kitsap, Pierce Counties	78,213	100%	69.03%	-30.97%	-33.20%	2.23%	0.37%
	King Except Seattle and SeaTac	93,697	100%	69.42%	-30.58%	-33.89%	3.31%	-0.71%
Mean Hours Worked	Seattle	49,872	265.57	244.12	-21.44	-41.00	19.56	
	Synthetic Seattle	50,312	279.50	251.72	-27.78	-43.10	15.32	4.24
	Synthetic Seattle Excluding King County	50,082	277.00	252.46	-24.54	-42.96	18.42	1.14
	Snohomish, Kitsap, Pierce	78,213	281.63	263.03	-18.60	-48.87	30.27	-10.71
	King County Except Seattle and SeaTac	93,697	277.82	259.99	-17.83	-41.14	23.31	-3.75
Median Quarterly Earnings	Seattle	\$49,872	\$2,169	\$2,483.98	\$314.62	-\$189.51	\$504.13	
	Synthetic Seattle	\$50,185	\$2,379	\$2,552.25	\$172.76	-\$228.32	\$401.08	\$103.05
	Synthetic Seattle Excluding King County	\$50,689	\$2,419	\$2,562.27	\$143.47	-\$247.92	\$391.40	\$112.73
	Snohomish, Kitsap, Pierce Counties	\$78,213	\$2,341	\$2,799.38	\$458.57	-\$118.45	\$577.01	-\$72.88
	King County Except Seattle and SeaTac	\$93,697	\$2,372	\$2,732.09	\$359.94	-\$183.29	\$543.23	-\$39.10
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>								
Median Hourly Wage Rate	Seattle	33,642	\$9.96	\$12.16	\$2.19	\$1.22	\$0.97	
	Synthetic Seattle	34,022	\$9.99	\$11.98	\$1.99	\$1.22	\$0.77	\$0.21
	Synthetic Seattle Excluding King County	33,783	\$9.95	\$11.76	\$1.80	\$1.22	\$0.58	\$0.39
	Snohomish, Kitsap, Pierce Counties	53,991	\$9.93	\$11.86	\$1.94	\$1.16	\$0.77	\$0.20
	King County Except Seattle and SeaTac	65,048	\$9.83	\$11.73	\$1.90	\$1.17	\$0.73	\$0.25
Mean Hours Worked	Seattle	33,642.0	293.3	361.9	68.6	52.5	16.1	
	Synthetic Seattle	33,712.0	308.0	373.4	65.4	47.4	17.9	-1.8
	Synthetic Seattle Excluding King County	33,659.0	310.2	370.7	60.4	43.5	16.9	-0.8
	Snohomish, Kitsap, Pierce Counties	53,991.0	311.3	381.0	69.7	42.5	27.2	-11.1
	King County Except Seattle and SeaTac	65,048.0	306.6	374.5	67.9	44.8	23.1	-7.0
Median Quarterly Earnings	Seattle	33,642	\$2,598	\$4,689	\$2,092	\$1,525	\$567	
	Synthetic Seattle	33,730	\$2,840	\$4,730	\$1,890	\$1,468	\$423	\$144
	Synthetic Seattle Excluding King County	34,928	\$2,816	\$4,569	\$1,753	\$1,392	\$361	\$206
	Snohomish, Kitsap, Pierce Counties	53,991	\$2,792	\$4,729	\$1,937	\$1,452	\$486	\$81
	King County Except Seattle and SeaTac	65,048	\$2,783	\$4,584	\$1,801	\$1,366	\$435	\$132
Share Who Remain in the Same Region	Seattle	33,642	100%	62.96%	-37.04%	-33.33%	-3.71%	
	Snohomish, Kitsap, Pierce Counties	53,991	100%	64.27%	-35.73%	-34.45%	-1.28%	-2.43%
	King County Except Seattle and SeaTac	65,048	100%	69.26%	-30.74%	-29.25%	-1.49%	-2.22%

**Table D6: Workers Employed By Single- Location Establishments with Hourly Wage Rate \$11 - \$13 at Baseline in Seattle and in Comparison Regions**

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014		2015		Change Over Six Quarters	Historical Change Over Six Quarters	Difference	Difference - in - Differences Between Seattle and Comparison Region
			Q2	Q3	Q4	Q1				
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>										
Median Hourly Wage Rate	Seattle	37,249	\$11.95	\$13.08	\$11.12	\$0.20	\$0.92			
	Synthetic Seattle	38,721	\$11.97	\$12.97	\$1.00	\$0.19	\$0.81	\$0.11		
	Synthetic Seattle Excluding King County	37,540	\$11.97	\$12.80	\$0.83	\$0.19	\$0.64	\$0.28		
	Snohomish, Kitsap, Pierce Counties	52,250	\$11.95	\$13.06	\$1.10	\$0.19	\$0.91	\$0.01		
	King County Except Seattle and SeaTac	51,266	\$11.97	\$13.10	\$1.13	\$0.16	\$0.97	-\$0.05		
Share Employed	Seattle	37,249	100%	76.44%	-23.56%	-26.45%	2.89%			
	Synthetic Seattle	37,770	100%	74.52%	-25.48%	-26.48%	1.00%	1.89%		
	Synthetic Seattle Excluding King County	37,664	100%	74.06%	-25.94%	-26.46%	0.52%	2.37%		
	Snohomish, Kitsap, Pierce Counties	52,250	100%	76.43%	-23.57%	-24.97%	1.40%	1.49%		
	King Except Seattle and SeaTac	51,266	100%	77.20%	-22.80%	-25.23%	2.42%	0.47%		
Mean Hours Worked	Seattle	37,249	359.4	323.2	-36.1	-48.4	12.3			
	Synthetic Seattle	37,398	365.5	316.0	-49.5	-54.8	5.2	7.1		
	Synthetic Seattle Excluding King County	37,391	364.1	312.9	-51.2	-56.6	5.4	6.9		
	Snohomish, Kitsap, Pierce	52,250	378.7	329.9	-48.9	-61.8	12.9	-0.6		
	King County Except Seattle and SeaTac	51,266	376.4	337.2	-39.2	-52.1	12.9	-0.6		
Median Quarterly Earnings	Seattle	\$37,249	\$4,510	\$5,175.55	\$665.97	-\$52.91	\$718.87	NA		
	Synthetic Seattle	\$38,137	\$4,537	\$4,783.47	\$246.08	-\$138.19	\$384.27	\$334.61		
	Synthetic Seattle Excluding King County	\$37,315	\$4,622	\$4,715.69	\$93.50	-\$202.61	\$296.11	\$422.76		
	Snohomish, Kitsap, Pierce Counties	\$52,250	\$4,801	\$5,168.52	\$367.46	-\$225.42	\$592.88	\$126.00		
	King County Except Seattle and SeaTac	\$51,266	\$4,806	\$5,377.66	\$571.93	-\$155.29	\$727.22	-\$8.35		
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>										
Median Hourly Wage Rate	Seattle	28,473	\$11.95	\$13.96	\$2.00	\$1.12	\$0.88			
	Synthetic Seattle	29,204	\$11.98	\$13.95	\$1.97	\$1.11	\$0.86	\$0.02		
	Synthetic Seattle Excluding King County	31,728	\$11.97	\$13.91	\$1.94	\$1.11	\$0.83	\$0.05		
	Snohomish, Kitsap, Pierce Counties	39,937	\$11.95	\$13.90	\$1.94	\$1.02	\$0.92	-\$0.04		
	King County Except Seattle and SeaTac	39,575	\$11.98	\$13.97	\$2.00	\$0.96	\$1.04	-\$0.16		
Mean Hours Worked	Seattle	28,473.0	383.7	422.9	39.2	29.7	9.5	NA		
	Synthetic Seattle	28,495.0	389.8	420.0	30.2	22.7	7.5	2.1		
	Synthetic Seattle Excluding King County	28,631.0	393.2	416.1	22.9	16.3	6.7	2.9		
	Snohomish, Kitsap, Pierce Counties	39,937.0	403.8	431.6	27.8	12.8	15.0	-5.4		
	King County Except Seattle and SeaTac	39,575.0	402.6	436.8	34.2	26.7	7.5	2.1		
Median Quarterly Earnings	Seattle	28,473	\$4,890	\$6,545	\$1,655	\$1,094	\$561			
	Synthetic Seattle	28,555	\$4,874	\$6,442	\$1,568	\$998	\$571	-\$9		
	Synthetic Seattle Excluding King County	28,579	\$4,929	\$6,385	\$1,456	\$945	\$511	\$50		
	Snohomish, Kitsap, Pierce Counties	39,937	\$5,123	\$6,501	\$1,378	\$806	\$571	-\$10		
	King County Except Seattle and SeaTac	39,575	\$5,158	\$6,710	\$1,552	\$862	\$690	-\$129		
Share Who Remain in the Same Region	Seattle	28,473	100%	72.02%	-27.98%	-26.02%	-1.96%	NA		
	Snohomish, Kitsap, Pierce Counties	39,937	100%	76.58%	-23.42%	-21.73%	-1.69%	-0.28%		
	King County Except Seattle and SeaTac	39,575	100%	73.71%	-26.29%	-24.83%	-1.46%	-0.50%		

**Table D7: Workers Employed By Single- Location Establishments and Multi-Location Firms with Hourly Wage Rate \$13 - \$15 at Baseline in Seattle and in Comparison Regions**

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014 Q2		2015 Q4		Change Over Six Quarters	Historical Change Over Six Quarters	Difference in - Difference Between Seattle and Comparison Region	
			2014 Q2	2015 Q4	2014 Q2	2015 Q4			Difference	Difference
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>										
Median Hourly Wage Rate	Seattle	33,407	\$14.02	\$15.23	\$1.21	\$0.36	\$0.85			
	Synthetic Seattle	33,503	\$14.02	\$15.05	\$1.04	\$0.36	\$0.68	\$0.16		
	Synthetic Seattle Excluding King County	33,451	\$14.01	\$14.95	\$0.94	\$0.34	\$0.60	\$0.24		
	Snohomish, Kitsap, Pierce Counties	46,000	\$14.01	\$15.20	\$1.19	\$0.27	\$0.92	-\$0.07		
	King County Except Seattle and SeaTac	48,027	\$14.02	\$15.23	\$1.20	\$0.29	\$0.91	-\$0.07		
Share Employed	Seattle	33,407	100%	78.84%	-21.16%	-22.07%	0.91%			
	Synthetic Seattle	33,693	100%	78.07%	-21.93%	-22.10%	0.16%	0.75%		
	Synthetic Seattle Excluding King County	33,874	100%	77.98%	-22.02%	-22.11%	0.09%	0.82%		
	Snohomish, Kitsap, Pierce Counties	46,000	100%	80.12%	-19.88%	-20.63%	0.74%	0.16%		
	King Except Seattle and SeaTac	48,027	100%	80.28%	-19.72%	-21.05%	1.33%	-0.42%		
Mean Hours Worked	Seattle	33,407	402.0	354.8	-47.1	-61.3	14.2			
	Synthetic Seattle	33,605	411.2	355.5	-55.6	-63.4	7.7	6.4		
	Synthetic Seattle Excluding King County	33,444	415.9	354.5	-61.4	-64.8	3.5	10.7		
	Snohomish, Kitsap, Pierce	46,000	414.8	365.5	-49.3	-67.2	17.9	-3.7		
	King County Except Seattle and SeaTac	48,027	412.5	367.3	-45.2	-60.9	15.7	-1.5		
Median Quarterly Earnings	Seattle	\$33,407	\$6,260	\$6,963.21	\$703.01	-41.77	744.78			
	Synthetic Seattle	\$33,765	\$6,350	\$6,768.90	\$418.68	-60.12	478.80	265.98		
	Synthetic Seattle Excluding King County	\$33,862	\$6,370	\$6,699.39	\$329.48	-86.17	415.66	329.12		
	Snohomish, Kitsap, Pierce Counties	\$46,000	\$6,362	\$6,822.63	\$460.91	-217.75	678.66	66.12		
	King County Except Seattle and SeaTac	\$48,027	\$6,374	\$7,076.98	\$703.14	-174.80	877.94	-133.16		
Share Who Remain in the Same Region	Seattle	33,407	100%	79.34%	-20.66%	-18.82%	-1.84%			
	Snohomish, Kitsap, Pierce Counties	46,000	100%	82.87%	-17.13%	-16.13%	-1.00%	-0.84%		
	King Except Seattle and SeaTac	48,027	100%	79.58%	-20.42%	-19.14%	-1.28%	-0.56%		
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>										
Median Hourly Wage Rate	Seattle	26,337	\$14.01	\$15.94	\$1.93	\$1.05	\$0.88			
	Synthetic Seattle	26,817	\$14.01	\$15.86	\$1.86	\$1.05	\$0.81	\$0.06		
	Synthetic Seattle Excluding King County	26,353	\$13.99	\$15.81	\$1.82	\$1.04	\$0.78	\$0.10		
	Snohomish, Kitsap, Pierce Counties	36,855	\$14.01	\$15.75	\$1.74	\$0.92	\$0.82	\$0.06		
	King County Except Seattle and SeaTac	38,556	\$14.02	\$15.93	\$1.91	\$1.00	\$0.91	-\$0.03		
Mean Hours Worked	Seattle	26,337.0	425.0	450.1	25.1	10.8	14.4			
	Synthetic Seattle	26,340.0	436.3	451.2	14.9	5.0	9.8	4.5		
	Synthetic Seattle Excluding King County	26,408.0	441.4	451.0	9.6	4.4	5.3	9.1		
	Snohomish, Kitsap, Pierce Counties	36,855.0	436.6	456.2	19.5	0.2	19.4	-5.0		
	King County Except Seattle and SeaTac	38,556.0	434.9	457.5	22.7	9.8	12.9	1.5		
Median Quarterly Earnings	Seattle	26,337	\$6,493	\$7,987	\$1,494	\$758	\$736			
	Synthetic Seattle	26,425	\$6,528	\$7,932	\$1,404	\$730	\$674	\$62		
	Synthetic Seattle Excluding King County	27,294	\$6,611	\$7,858	\$1,248	\$668	\$580	\$156		
	Snohomish, Kitsap, Pierce Counties	36,855	\$6,575	\$7,846	\$1,271	\$594	\$677	\$59		
	King County Except Seattle and SeaTac	38,556	\$6,593	\$8,066	\$1,474	\$683	\$791	-\$55		
Share Who Remain in the Same Region	Seattle	26,337	100%	77.07%	-22.93%	-20.68%	-2.26%			
	Snohomish, Kitsap, Pierce Counties	36,855	100%	81.63%	-18.37%	-17.21%	-1.15%	-1.10%		
	King County Except Seattle and SeaTac	38,556	100%	77.97%	-22.03%	-20.63%	-1.40%	-0.85%		

**Table D8: Workers Employed By Single- Location Establishments and Multi-Location Firms with Hourly Wage Rate \$15 - \$18 at Baseline in Seattle and in Comparison Regions**

Quarterly Outcome for Workers	Region	Number of Workers in 2014 Q2	2014 Q2		2015 Q4		Difference - in - Differences Between Seattle and Comparison Region	
			2014 Q2	2015 Q4	Change Over Six Quarters	Historical Change Over Six Quarters	Difference	Differences Between Seattle and Comparison Region
<b>Panel A. All Workers Employed At T=0 (Baseline Quarter)</b>								
Median Hourly Wage Rate	Seattle	44,765	\$16.51	\$17.92	\$1.40	\$0.53	\$0.88	
	Synthetic Seattle	45,039	\$16.52	\$17.74	\$1.22	\$0.52	\$0.70	\$0.18
	Synthetic Seattle Excluding King County	44,957	\$16.52	\$17.65	\$1.13	\$0.48	\$0.65	\$0.23
	Snohomish, Kitsap, Pierce Counties	60,196	\$16.47	\$17.70	\$1.23	\$0.32	\$0.91	-\$0.03
	King County Except Seattle and SeaTac	62,990	\$16.46	\$17.77	\$1.31	\$0.40	\$0.92	-\$0.04
Share Employed	Seattle	44,765	100%	81.49%	-18.51%	-19.43%	0.93%	
	Synthetic Seattle	46,262	100%	81.05%	-18.95%	-19.31%	0.36%	0.56%
	Synthetic Seattle Excluding King County	44,781	100%	80.74%	-19.26%	-19.36%	0.10%	0.83%
	Snohomish, Kitsap, Pierce Counties	60,196	100%	83.23%	-16.77%	-17.93%	1.16%	-0.24%
	King Except Seattle and SeaTac	62,990	100%	82.78%	-17.22%	-18.37%	1.15%	-0.22%
Mean Hours Worked	Seattle	44,765	436.8	384.1	-52.7	-64.5	11.8	
	Synthetic Seattle	45,040	446.8	381.4	-65.4	-65.1	-0.3	12.1
	Synthetic Seattle Excluding King County	45,001	445.1	378.4	-66.7	-65.6	-1.0	12.8
	Snohomish, Kitsap, Pierce	60,196	446.1	393.5	-52.7	-66.9	14.2	-2.4
	King County Except Seattle and SeaTac	62,990	447.2	394.4	-52.8	-64.6	11.8	0.0
Median Quarterly Earnings	Seattle	\$44,765	\$7,937	\$8,855.08	\$918.32	162.4254	755.892	
	Synthetic Seattle	\$47,192	\$7,996	\$8,754.62	\$758.81	134.60015	624.2109	131.6811
	Synthetic Seattle Excluding King County	\$45,526	\$8,018	\$8,694.72	\$677.12	107.77062	569.3466	186.54541
	Snohomish, Kitsap, Pierce Counties	\$60,196	\$7,922	\$8,634.51	\$712.94	-89.866374	802.8029	-46.910916
	King County Except Seattle and SeaTac	\$62,990	\$7,971	\$8,898.68	\$928.04	-1.322103	929.3612	-173.46918
<b>Panel B. Workers Employed At T=6 (6 Quarters After The Baseline)</b>								
Median Hourly Wage Rate	Seattle	36,481	\$16.52	\$18.71	\$2.19	\$1.33	\$0.86	
	Synthetic Seattle	36,597	\$16.52	\$18.69	\$2.17	\$1.29	\$0.88	-\$0.02
	Synthetic Seattle Excluding King County	36,742	\$16.53	\$18.56	\$2.03	\$1.22	\$0.81	\$0.05
	Snohomish, Kitsap, Pierce Counties	50,103	\$16.47	\$18.34	\$1.87	\$1.01	\$0.86	\$0.01
	King County Except Seattle and SeaTac	52,145	\$16.46	\$18.49	\$2.03	\$1.13	\$0.89	-\$0.03
Mean Hours Worked	Seattle	36,481	455.2	471.3	16.1	4.0	12.1	
	Synthetic Seattle	37,199	464.8	468.3	3.5	-0.1	3.6	8.4
	Synthetic Seattle Excluding King County	37,195	466.2	470.4	4.2	-0.1	4.3	7.8
	Snohomish, Kitsap, Pierce Counties	50,103	462.1	472.7	10.6	-4.0	14.6	-2.5
	King County Except Seattle and SeaTac	52,145	463.2	476.5	13.3	0.8	12.5	-0.4
Median Quarterly Earnings	Seattle	36,481	\$8,077	\$9,631	\$1,554	\$816	\$738	
	Synthetic Seattle	37,005	\$8,163	\$9,620	\$1,457	\$757	\$700	\$38
	Synthetic Seattle Excluding King County	37,438	\$8,197	\$9,561	\$1,364	\$687	\$677	\$61
	Snohomish, Kitsap, Pierce Counties	50,103	\$8,049	\$9,375	\$1,326	\$574	\$752	-\$14
	King County Except Seattle and SeaTac	52,145	\$8,096	\$9,622	\$1,526	\$673	\$853	-\$115
Share Who Remain in the Same Region	Seattle	36,481	100%	81.54%	-18.46%	-17.10%	-1.36%	
	Snohomish, Kitsap, Pierce Counties	50,103	100%	84.37%	-15.63%	-14.64%	-0.99%	-0.36%
	King County Except Seattle and SeaTac	52,145	100%	80.96%	-19.04%	-17.91%	-1.12%	-0.23%

## Appendix E: Tables for Impact on Jobs

Table E1: Jobs at All Single-Location Establishments

Quarterly Outcome for Workers	Region	2014 Q2	2015 Q4	Change Over Six Quarters	Historical Change Over Six Quarters	Difference	Difference - in - Differences Between Seattle and Comparison Region
<b>Panel A. All Currently Open Establishments</b>							
Number of Jobs at the Beginning of Quarter	Seattle	100%	110.50%	10.50%	7.66%	2.84%	
	Synthetic Seattle	100%	109.03%	9.03%	7.04%	1.99%	0.86%
	Synthetic Seattle Excluding King County	100%	108.47%	8.47%	7.00%	1.48%	1.37%
	Snohomish, Kitsap, Pierce Counties	100%	107.21%	7.21%	3.02%	4.18%	-1.34%
	King County Except Seattle and SeaTac	100%	107.06%	7.06%	5.94%	1.12%	1.72%
Total Headcount in Quarter	Seattle	100%	107.87%	7.87%	5.52%	2.35%	
	Synthetic Seattle	100%	105.47%	5.47%	4.85%	0.61%	1.74%
	Synthetic Seattle Excluding King County	100%	104.97%	4.97%	4.48%	0.49%	1.87%
	Snohomish, Kitsap, Pierce Counties	100%	104.98%	4.98%	1.54%	3.44%	-1.08%
	King Except Seattle and SeaTac	100%	106.89%	6.89%	4.73%	2.17%	0.19%
Total Hours in Quarter	Seattle	100%	112.95%	12.95%	7.56%	5.39%	
	Synthetic Seattle	100%	109.83%	9.83%	7.09%	2.74%	2.65%
	Synthetic Seattle Excluding King County	100%	109.23%	9.23%	6.58%	2.65%	2.74%
	Snohomish, Kitsap, Pierce	100%	109.50%	9.50%	2.46%	7.04%	-1.65%
	King County Except Seattle and SeaTac	100%	110.53%	10.53%	5.75%	4.78%	0.61%
Average Hours Per Headcount in Quarter	Seattle	362.4	379.4	17.0	7.1	10.0	
	Synthetic Seattle	366.3	382.9	16.6	6.1	10.5	-0.5
	Synthetic Seattle Excluding King County	366.2	383.0	16.8	6.5	10.3	-0.3
	Snohomish, Kitsap, Pierce Counties	350.9	366.1	15.1	3.1	12.1	-2.1
	King County Except Seattle and SeaTac	379.9	392.8	12.9	3.7	9.2	0.7
<b>Panel B. Establishments with &gt;40% of Workers Paid &lt;\$15 in Baseline Quarter</b>							
Number of Jobs at the Beginning of Quarter	Seattle	100%	99.53%	-0.47%	-1.44%	0.97%	
	Synthetic Seattle	100%	99.62%	-0.38%	-1.45%	1.07%	-0.09%
	Synthetic Seattle Excluding King County	100%	96.69%	-3.31%	-1.49%	-1.81%	2.79%
	Snohomish, Kitsap, Pierce Counties	100%	99.83%	-0.17%	-5.98%	5.80%	-4.83%
	King Except Seattle and SeaTac	100%	98.65%	-1.35%	-3.69%	2.34%	-1.36%
Total Headcount in Quarter	Seattle	100%	95.20%	-4.80%	-9.27%	4.47%	
	Synthetic Seattle	100%	90.44%	-9.56%	-9.27%	-0.29%	4.76%
	Synthetic Seattle Excluding King County	100%	90.35%	-9.65%	-9.08%	-0.57%	5.04%
	Snohomish, Kitsap, Pierce Counties	100%	95.76%	-4.24%	-11.68%	7.43%	-2.97%
	King Except Seattle and SeaTac	100%	96.96%	-3.04%	-8.48%	5.44%	-0.98%
Total Hours in Quarter	Seattle	100%	96.44%	-3.56%	-6.66%	3.10%	
	Synthetic Seattle	100%	95.22%	-4.78%	-6.78%	2.00%	1.10%
	Synthetic Seattle Excluding King County	100%	94.44%	-5.56%	-6.73%	1.17%	1.93%
	Snohomish, Kitsap, Pierce Counties	100%	100.53%	0.53%	-8.77%	9.29%	-6.19%
	King Except Seattle and SeaTac	100%	100.70%	0.70%	-6.48%	7.18%	-4.08%
Average Hours Per Headcount in Quarter	Seattle	294.7	298.6	3.8	8.3	-4.5	
	Synthetic Seattle	292.3	303.8	11.5	8.6	3.0	-7.5
	Synthetic Seattle Excluding King County	292.3	306.0	13.7	8.8	4.8	-9.3
	Snohomish, Kitsap, Pierce Counties	304.8	320.0	15.2	9.8	5.4	-9.9
	King Except Seattle and SeaTac	293.3	304.6	11.3	6.4	4.9	-9.4

Table E2: Jobs at All Single- & Multi-Location Establishments

Quarterly Outcome for Workers	Region	2014 Q2	2015 Q4	Change Over Six Quarters	Historical Change Over Six Quarters	Difference	Difference - in - Differences Between Seattle and Comparison Region
<b>Panel A. All Currently Open Establishments</b>							
Number of Jobs at the Beginning of Quarter	Seattle	100%	105.64%	5.64%	6.03%	-0.39%	
	Synthetic Seattle	100%	104.13%	4.13%	5.78%	-1.65%	1.26%
	Synthetic Seattle Excluding King County	100%	104.52%	4.52%	5.51%	-0.99%	0.60%
	Snohomish, Kitsap, Pierce Counties	100%	105.57%	5.57%	3.57%	2.00%	-2.39%
	King County Except Seattle and SeaTac	100%	106.24%	6.24%	4.97%	1.27%	-1.66%
Total Headcount in Quarter	Seattle	100%	105.06%	5.06%	5.38%	-0.31%	
	Synthetic Seattle	100%	104.27%	4.27%	4.86%	-0.59%	0.28%
	Synthetic Seattle Excluding King County	100%	103.48%	3.48%	4.41%	-0.93%	0.62%
	Snohomish, Kitsap, Pierce Counties	100%	104.31%	4.31%	2.69%	1.62%	-1.93%
	King Except Seattle and SeaTac	100%	106.04%	6.04%	4.19%	1.86%	-2.17%
Total Hours in Quarter	Seattle	100%	110.41%	10.41%	6.28%	4.13%	
	Synthetic Seattle	100%	108.92%	8.92%	5.75%	3.17%	0.96%
	Synthetic Seattle Excluding King County	100%	108.06%	8.06%	5.41%	2.65%	1.47%
	Snohomish, Kitsap, Pierce	100%	108.51%	8.51%	3.21%	5.30%	-1.18%
	King County Except Seattle and SeaTac	100%	109.40%	9.40%	6.19%	3.21%	0.92%
Average Hours Per Headcount in Quarter	Seattle	383.9	403.4	19.5	3.3	16.2	
	Synthetic Seattle	381.0	399.4	18.4	3.9	14.5	1.7
	Synthetic Seattle Excluding King County	373.1	391.4	18.3	4.3	14.0	2.1
	Snohomish, Kitsap, Pierce Counties	353.4	367.6	14.2	1.7	12.5	3.7
	King County Except Seattle and SeaTac	385.2	397.4	12.2	7.5	4.8	11.4
<b>Panel B. Establishments with &gt;40% of Workers Paid &lt;\$15 in Baseline Quarter</b>							
Number of Jobs at the Beginning of Quarter	Seattle	100%	101.18%	1.18%	1.20%	-0.03%	
	Synthetic Seattle	100%	100.22%	0.22%	1.56%	-1.34%	1.32%
	Synthetic Seattle Excluding King County	100%	100.38%	0.38%	0.76%	-0.39%	0.36%
	Snohomish, Kitsap, Pierce Counties	100%	99.83%	-0.17%	-2.31%	2.14%	-2.16%
	King Except Seattle and SeaTac	100%	100.10%	0.10%	-1.92%	2.01%	-2.04%
Total Headcount in Quarter	Seattle	100%	99.61%	-0.39%	-2.49%	2.11%	
	Synthetic Seattle	100%	94.64%	-5.36%	-2.16%	-3.20%	5.30%
	Synthetic Seattle Excluding King County	100%	94.82%	-5.18%	-2.10%	-3.09%	5.19%
	Snohomish, Kitsap, Pierce Counties	100%	98.67%	-1.33%	-5.38%	4.05%	-1.94%
	King Except Seattle and SeaTac	100%	98.79%	-1.21%	-4.65%	3.44%	-1.34%
Total Hours in Quarter	Seattle	100%	101.69%	1.69%	-2.06%	3.74%	
	Synthetic Seattle	100%	99.36%	-0.64%	-2.31%	1.66%	2.08%
	Synthetic Seattle Excluding King County	100%	99.43%	-0.57%	-2.03%	1.46%	2.28%
	Snohomish, Kitsap, Pierce Counties	100%	101.99%	1.99%	-3.85%	5.83%	-2.09%
	King Except Seattle and SeaTac	100%	102.36%	2.36%	0.61%	1.75%	2.00%
Average Hours Per Headcount in Quarter	Seattle	300.6	306.8	6.3	1.3	4.9	
	Synthetic Seattle	302.6	311.3	8.7	5.3	3.4	1.5
	Synthetic Seattle Excluding King County	302.7	313.7	11.0	5.8	5.2	-0.2
	Snohomish, Kitsap, Pierce Counties	305.6	315.9	10.3	5.0	5.3	-0.4
	King Except Seattle and SeaTac	301.8	312.7	10.9	17.5	-6.6	11.6

## Appendix F: Tables for Impact on Establishments

Table F1: Single Location Establishments

Quarterly Outcome for Workers	Region	2014 Q2	2015 Q4	Change Over Six Quarters	Historical Change Over Six Quarters	Difference	Difference - in - Differences Between Seattle and Comparison Region
<b>Panel A. All Currently Open Establishments</b>							
Share of Establishments Open in T=6 Which Opened Since Baseline Quarter	Seattle	0%	21.62%	21.62%	20.67%	0.95%	
	Synthetic Seattle	0%	20.51%	20.51%	20.46%	0.05%	0.90%
	Synthetic Seattle Excluding King County	0%	20.22%	20.22%	20.28%	-0.07%	1.02%
	Snohomish, Kitsap, Pierce Counties	0%	20.99%	20.99%	21.53%	-0.54%	1.49%
	King County Except Seattle and SeaTac	0%	20.78%	20.78%	21.34%	-0.56%	1.51%
Share of Establishments Open in Baseline Quarter Which Closed by Current Quarter	Seattle	0%	17.78%	17.78%	18.30%	-0.52%	
	Synthetic Seattle	0%	16.92%	16.92%	18.15%	-1.23%	0.71%
	Synthetic Seattle Excluding King County	0%	16.82%	16.82%	18.18%	-1.36%	0.84%
	Snohomish, Kitsap, Pierce	0%	17.90%	17.90%	20.20%	-2.30%	1.77%
	King County Except Seattle and SeaTac	0%	17.20%	17.20%	18.99%	-1.79%	1.26%
<b>Panel B. Establishments With &gt;40% of Workers Paid &lt;\$15 at Baseline</b>							
Share of Establishments Open in Baseline Quarter Which Closed by Current Quarter	Seattle	0%	19.71%	19.71%	20.59%	-0.88%	
	Synthetic Seattle	0%	18.65%	18.65%	20.57%	-1.93%	1.05%
	Synthetic Seattle Excluding King County	0%	18.57%	18.57%	20.56%	-1.99%	1.11%
	Snohomish, Kitsap, Pierce Counties	0%	19.36%	19.36%	22.23%	-2.87%	1.99%
	King County Except Seattle and SeaTac	0%	17.95%	17.95%	21.29%	-3.35%	2.47%

Table F2: Single-Location Establishments and Multi-Location Firms

Quarterly Outcome for Workers	Region	2014 Q2	2015 Q4	Change Over Six Quarters	Historical Change Over Six Quarters	Difference	Difference - in - Differences Between Seattle and Comparison Region
<b>Panel A. All Currently Open Establishments</b>							
Share of Establishments Open in T=6 Which Opened Since Baseline Quarter	Seattle	0%	20.83%	20.83%	20.48%	0.35%	
	Synthetic Seattle	0%	19.66%	19.66%	20.25%	-0.59%	0.93%
	Synthetic Seattle Excluding King County	0%	19.82%	19.82%	20.21%	-0.39%	0.73%
	Snohomish, Kitsap, Pierce Counties	0%	20.81%	20.81%	21.34%	-0.52%	0.87%
	King County Except Seattle and SeaTac	0%	20.29%	20.29%	20.93%	-0.64%	0.99%
Share of Establishments Open in Baseline Quarter Which Closed by Current Quarter	Seattle	0%	17.54%	17.54%	18.35%	-0.81%	
	Synthetic Seattle	0%	16.86%	16.86%	18.30%	-1.45%	0.64%
	Synthetic Seattle Excluding King County	0%	16.75%	16.75%	18.13%	-1.38%	0.57%
	Snohomish, Kitsap, Pierce	0%	17.74%	17.74%	20.03%	-2.29%	1.48%
	King County Except Seattle and SeaTac	0%	16.91%	16.91%	18.69%	-1.79%	0.98%
<b>Panel B. Establishments With &gt;40% of Workers Paid &lt;\$15 at Baseline</b>							
Share of Establishments Open in Baseline Quarter Which Closed by Current Quarter	Seattle	0%	19.24%	19.24%	20.55%	-1.30%	
	Synthetic Seattle	0%	18.55%	18.55%	20.54%	-1.99%	0.69%
	Synthetic Seattle Excluding King County	0%	18.58%	18.58%	20.51%	-1.94%	0.63%
	Snohomish, Kitsap, Pierce Counties	0%	19.24%	19.24%	22.07%	-2.83%	1.52%
	King County Except Seattle and SeaTac	0%	17.70%	17.70%	20.95%	-3.24%	1.94%



## Appendix G: UW Minimum Wage Study Team

### University of Washington Investigators

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