MINIMUM WAGE AND TIME SPENT LOOKING FOR WORK

An Undergraduate Research Scholars Thesis

by

CAMILLA ADAMS

Submitted to the Undergraduate Research Scholars program at
Texas A&M University
in partial fulfillment of the requirements for the designation as an

UNDERGRADUATE RESEARCH SCHOLAR

Approved by Research Advisor: Dr. Jonathan Meer

May 2018

Major: Economics

TABLE OF CONTENTS

ABSTRACT

Minimum Wage and Time Spent Looking for Work

Camilla Adams
Department of Economics
Texas A&M University

Research Advisor: Dr. Jonathan Meer
Department of Economics
Texas A&M University

To evaluate the effect of minimum wage increases, theoretical search-and-matching models of the labor market rely on supply side responses attributed to increased incentives. The current minimum wage literature lacks an empirical supply side study of the impact of minimum wage on search effort. We conduct difference-in-difference regressions and a dynamic analysis with event study plots to show a supply side response to elevated minimum wage. Using American Time Use Survey (ATUS) and Current Population Survey (CPS) data from 2003-2016, we find increases to minimum wage lead to large yet transitory spikes in the amount of time individuals spend looking for work particularly the unemployed and those who report searching.

CHAPTER I

INTRODUCTION

Minimum wage policies continue to ignite debate. Minimum wage serves as a legally mandated lower bound on hourly wage. Its purpose is to ensure a higher standard of living for low wage employees. The policy's complete consequences are unknown. This article observes the impact of minimum wage increases on search effort.

Government involvement in the price of wages potentially initiates a series of economic inefficiencies. Inefficiencies can yield both positive and negative effects. Will consumers see higher wages passed on through elevated prices? Will companies lay off workers they can no longer afford? Conversely, there may be benefits to a higher minimum wage. Will low wage workers see increased pay on average? This paper finds increases to the minimum wage transform search behavior by increasing the amount of time individuals spend looking for work.

Difference-in-difference studies, beginning with Card and Krueger, are often used to evaluate the impact of minimum wage by observing a treatment group, those experiencing heightened wages, versus the untreated counterfactual. The difference following policy implementation in employment level indicates the effect of minimum wage (Card and Kruger, 1994). Evidence from Seattle's 2015 minimum wage increase shows 9 percent fewer hours worked and lower take home pay across all low wage industries. The Seattle study uses a synthetic control to generate a counterfactual Seattle, unaffected by treatment (Jardim et. al., 2017). Minimum wage changes however impact new employment growth rates, not necessarily employment levels (Meer and West, 2013).

Minimum wage increases also interact with other government programs such as Medicaid and unemployment insurance benefits. When changes to the minimum wage raise incomes above Medicaid availability, individuals reduce hours worked to retain eligibility (Clemens and Wither, 2013). Additionally, unemployment insurance (UI) benefits, transfers given by the government to those who have lost their job, change individual's compensation structure thus affecting the job search of the unemployed. Increased UI reduces the opportunity cost of a lengthy job search. Reduced opportunity cost allows searchers to wait for higher quality jobs (Acemoglu, 2001).

The minimum wage literature has surprisingly little focus on the supply side due to historic limitations regarding availability of data. The American Time Use Survey (ATUS) allows for detailed observation of daily activities. The ATUS is a diary survey observing each individual once. The following papers use the ATUS to study employment.

Krueger and Mueller study the impact of UI benefits on search effort. Using this supply side data, they find time spent looking for work is inversely related to generosity of UI benefits. Additionally, the relationship between employment status and search effort reveals employed job searchers are more successful than unemployed searchers. Success is evaluated as receiving more and higher offers of future employment (Faberman et al, 2017).

While Mueller finds that search effort scales with wage, the question of minimum wage's interaction with search effort persists (Mueller 2009). Pérez Pérez uses the ATUS to study an impact of minimum wage on commute times finding increases in minimum wage reduce the number of "low wage commuters." Evidence regarding the effect minimum wage increases on time spent looking for work is incomplete.

Our study's leading contribution is an analysis of minimum wage increases' impact on search effort. Through the ATUS, we observe supply side responses to minimum wage policy.

We show increased minimum wages result in increased time spent looking for work. The rest of the article is structured as follows. Section II presents our model and the data used. Section III presents the results. Section IIII is a conclusion of our findings.

CHAPTER II

METHODS

We plan to look at those employed at the minimum wage. While this is often not reported alone. Economist use proxy indicators to identify such workers. Often minimum wage workers are high school dropouts or fast food employees. We will use statistical software to review the data using difference-in-difference models and regressions.

Using STATA, a statistical software, we plan to run difference-in-difference regressions to analyze possible impacts of minimum wage increases. We will also use an event study to look at the impact of minimum wage increases before and after the policy changes. Additionally, the unique nature of our data's format enables us to analyze the work day. We will be reviewing the impact of minimum wage on number of breaks and the length of those breaks.

The paper, "Minimum Wage Increases, Wages, and Low-Wage Employment: Evidence from Seattle," uses detailed data from the City of Seattle prior to and after the policy change. The paper also uses a "synthetic control" to provide more precise counterfactual to Seattle yielding less biased estimators of the effect of minimum wage.

Many minimum wage papers use natural experiments to understand the impacts of minimum wage. While the results have been largely discredited, Card and Kruger famously conducted a minimum wage study variation in minimum wage in border towns.

Our research uses a large data set with over three million observations over more than ten years. While we do not focus on a natural experiment, the large size allows for more intense and detailed statistical analysis. We are not limited to one state, city, or year.

CHAPTER III

DATA

This paper uses 14 sequential years of data (2003-2016) from the ATUS. From 2003 to 2016, observation of 2 million individuals total over 5 million recorded activities. The ATUS acts as an extension of the Current Population Survey (CPS). Households are randomly selected for participation following completion of the CPS. The ATUS is conducted two to five months following CPS completion. Individuals are interviewed about their previous day during which they are asked to describe each activity's location, duration, and participants. The number of individuals observed in a state is proportional to the number of individuals in that given state. Black, Hispanic, and households with children however are oversampled. Given a household's selection for participation and being over the age of 15 selection for the survey is random.

The ATUS's diary format allows observation at the level thus each minute is observed and accounted. Surveys such as the CPS ask individuals about the behavior regarding similar topics; however, specifics regarding activities often are rounded or forgotten. Individuals round thirty eight hours of work to forty hours or forget leaving the office late. The ATUS provides an extremely detailed one time observation of an individual's daily activities.

The diary format allowed this study to uniquely observe time spent looking for work as reported by individuals. Additionally, the ATUS's observation of the previous day offers a more accurate description of time spent. To study search effort, this study aggregates variables relating to time spent looking for work. Variables included are: all activities coded as job search activities, job interviewing, waiting associated with job search or interviewing, security procedures related to job search/interviewing, and all job search and interviewing activities not

elsewhere classified. Minimum wage data was observed at the month and state level and obtained from the Department of Labor. Table 1 presents the summary statistics for our dataset.

Table 1: Summary Statistics

	Avg. Age	*Pct. White*	*Pct. Male*	*Pct. with Less than College Degree*	*Pct. Participating In Job Search*	*Avg. Daily Job Search (Mins)*	*Avg. Non-Zero Daily Job Search*
Labor Force Status							
Unemployed (n=8,720)	36.22	0.71	0.46	0.83	0.15	21.42	143.01
Employed (n=112,996)	42.70	0.82	0.49	0.62	0.00	0.53	108.34
Not in Labor Force (n=59,619)	56.84	0.80	0.34	0.80	0.00	0.42	130.51
Total (n=181,335)	47.04	0.81	0.44	0.69	0.01	1.50	132.47
Job Searchers							
Not Searching for Work (n=179,284)	47.13	0.81	0.44	0.69	0.00	0.00	-
Searching Status (n=2,051)	39.58	0.71	0.54	0.69	1.00	132.47	132.47
Total (n=181,335)	47.04	0.81	0.44	0.69	0.01	1.50	132.47

CHAPTER IV

MODELS

We use regression and an event study. The regressions present the coefficient on log minimum wage from regression of minutes searching for work on log minimum wage with state fixed effects, year fixed effects, and month fixed effects. We run this regression with a series of specifications. The event study graphs plot coefficients from the regressions of minutes searching for work on months before/after treatment dummies, controlling for individual state, year, and month effects. We observe changes of a dollar or greater. Many states index yearly for inflation yielding annual minimum wage changes. These fluctuations do not observe the impact of the policy changes we are interested in studying. Our regression uses state, month, and year fixed effects as controls. By introducing, these controls we identify changes independent of regional, annual, or yearly variation. These fixed effects allow useful observation highly seasonal minimum wage employment. The model observes the coefficient prior to the policy change. The first month of elevated minimum wage is the treatment month, or month 0. Subsequent months experience the elevated wage. We observe the preceding five months and following five months to avoid variation induced by the introduction of additional policy.

CHAPTER V

RESULTS

In Table 2, we observe the baseline model with a series of specification changes. The baseline model uses state, year, and month fixed effects reporting the coefficient on log minimum wage from the regression of minutes searching for work on dummy variables for years, states, and months. We add controls to observe specific subsets of our sample to check for consistency of results. Column 2 shows statistical significance at the 5 percent level prior to adding controls for age. Column 3 reports statistical significance when controlling for years of education. Column 4 reports statistical significance for level of available unemployment benefits. In column 6, we add controls only using data from 2010 onward. Our findings are not driven by the recession. The lack of significance is generated by a reduced sample size.

Table 2: Specification Changes

	(1) Baseline	(2)	(3)	(4)	(5)	(6)
log(minimum wage)	1.520*	1.533*	1.517*	1.681*	1.412	2.225
	(0.70)	(0.70)	(0.70)	(0.77)	(0.91)	(1.93)
N	181335	181335	181335	156057	181335	82557
State by Year FE	No	No	No	No	Yes	No
Age Control	No	Yes	No	No	No	No
Education Control	No	No	Yes	No	No	No
Unemployment Benefits Control	No	No	No	Yes	No	No
Sample from 2010 on	No	No	No	No	No	Yes

standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table reports coefficients and standard errors for regression of minutes searching for work on log minimum wage and other regressors. All models (1)-(6) includes state fixed effects, year fixed effects, month fixed effects, and robust standard errors clustered at the state level. (1) is the baseline model which reports the coefficient on log minimum wage from the regression of minutes searching for work on dummy variables for years, states and months. Columns (2) -(6) extend the baseline model. (2) controls for age. (3) controls for years of education. (4) controls for level of available unemployment benefits (5) adds state-by-year dummies. (6) only uses data from 2010 onward

In Table 3, we observe the baseline model for subgroups. Subgroups traditionally studied in the minimum wage literature were observed. The baseline model, those searching, unemployed, those with less than a college degree show elevated search effort. The ATUS allows those being surveyed to indicate job searching regardless of employment status. Unemployed individuals

have searched for a job in the last month and are not presently employed. Less than a college degree is those who attended college but failed to graduate.

Table 3: Subgroups and Baseline Model

	(1) Baseline	(2) Searchers	(3) Unemployed	(4) Less than College Degree	(5) College Degree or More	(6) Age 25-54	(7) Age 24 or less	(8) Searching and Unemployed
logmw	1.520*	145.9*	39.04**	2.295*	0.184	1.129	2.310	155.60*
	(0.700)	(61.28)	(14.46)	(0.877)	(1.518)	(1.121)	(1.725)	(81.71)
N	181335	2051	8720	124911	56424	101988	19419	1306

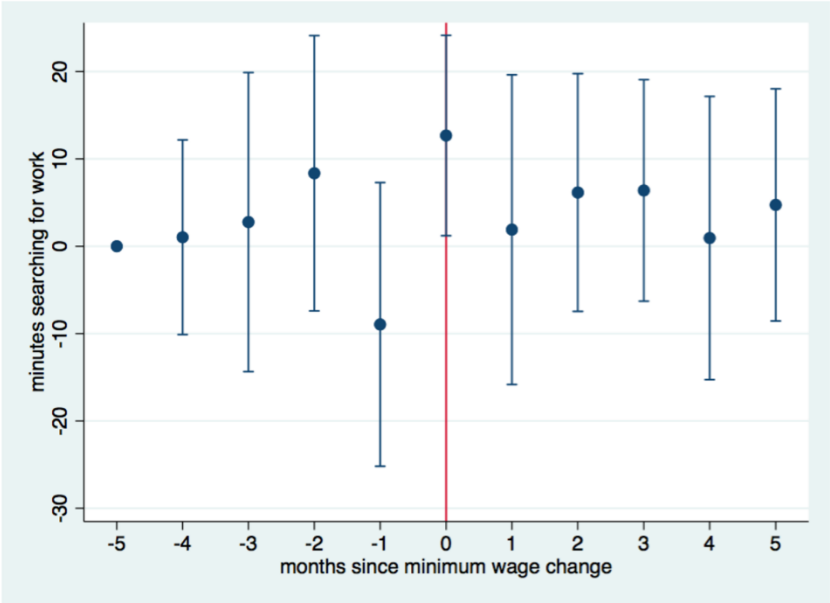
standard error in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Each column presents the coefficient on log minimum wage from regression of minutes searching for work on log minimum wage with individual state, year and month dummies. Standard errors are robust and clustered at the state level. (2) is run only on those who report searching for work. (3) is only unemployed. (4) is those with less than a college degree. (5) is those with more than a college degree. (6) is those ages 25-54 or "prime age". (7) is those less than 24 or "young". (8) is those who are both searching for work and unemployed.

Figure 1 shows elevated job search following treatment of increased minimum wage. We observe the coefficient for the unemployed. In the month prior to treatment, the depressed search effort could be attributed to knowledge of future wage increases. We see consistently elevated search effort following minimum wage increases.

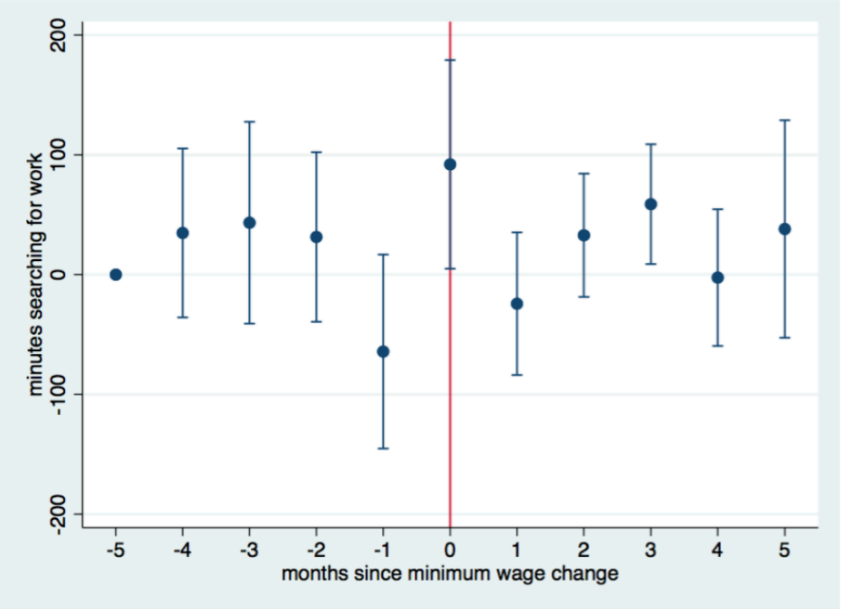
Figure 1: Coefficient plot Minutes Searching for Work (Unemployed Only)



Graph plots coefficients from regression of minutes searching for work on months before/after treatment dummies, controlling for individual state, year and month effects. Robust standard errors are clustered at the state level and the regression is run on only the unemployed

Figure 2 shows increases in the coefficient for unemployed individuals searching for employment. We observe increased search effort in the treatment month.

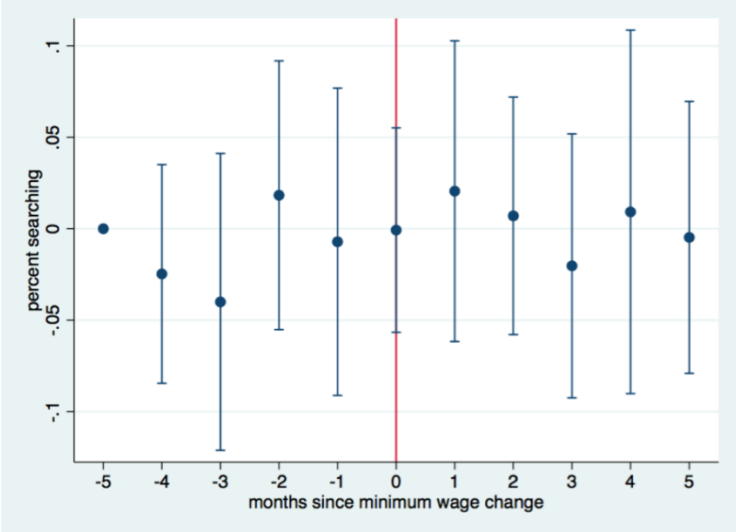
Figure 2: Coefficient plot Minutes Searching for Work (Unemployed searchers only)



Graph plots coefficients from regression of minutes searching on months before/after treatment dummies, controlling for individual state, year and month effects. Robust standard errors are clustered at the state level and the regression is run on only the unemployed who report searching.

Figure 3 shows the percentage of the population searching for employment is stable through treatment of minimum wage increases.

Figure 3: Coefficient plots for probability of Searching for Work



Graph plots coefficients from regression of probability of searching before/after treatment dummies, controlling for individual state, year and month effects. Robust standard errors are clustered at the state level.The entire sample is used.

CHAPTER VI

CONCLUSION

This paper shows increased minimum wage leads to increased search effort. We observe an elevated supply side response following policy changes. The ATUS data diary survey provides uniquely specific documentation of daily activities allowing for detailed observation of behavior changes. Using difference-in-difference presented in event studies, we see time spent searching for working increase during month of policy implementation.

Our study observes increased search effort, but the consequences of elevated search provide topic for further research. Specifically, the implications of increased search effort on better job matching, discouraged workers, and labor force participation.

REFERENCES

Acemoglu, Daron, 2001. "Good Jobs versus Bad Jobs," Journal of Labor Economics, University of Chicago Press, vol. 19(1), pages 1-21, January.

Card, David & Krueger, Alan B, 1994. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," American Economic Review, American Economic Association, vol. 84(4), pages 772-793, September.

Clemens, Jeffrey & Wither, Michael, 2016. Is Tinkering with Safety Net Programs Harmful to Beneficiaries? Evidence from the Medicaid Notch and the Minimum Wage in , Social Insurance Programs (Trans-Atlantic Public Economic Seminar - TAPES), National Bureau of Economic Research, Inc.

Faberman et al., 2016. "Job Search Behavior among the Employed and Non-Employed," 2016 Meeting Papers 1469, Society for Economic Dynamics.

Krueger, Alan B. & Mueller, Andreas I., 2008. "Job Search and Unemployment Insurance: New Evidence from Time Use Data," IZA Discussion Papers 3667, Institute for the Study of Labor (IZA).

Meer, Jonathan & West, Jeremy, 2016. "Effects of the Minimum Wage on Employment Dynamics," Journal of Human Resources, University of Wisconsin Press, vol. 51(2), pages 500-522.

Jardim, Ekaterina, et al., 2017. “Minimum Wage Increases, Wages, And Low-Wage Employment: Evidence from Seattle.” NBER Working Paper No. 23532, October.

Mueller, Andreas, 2010. "On-the-job search and wage dispersion: New evidence from time use data,"Economics Letters, Elsevier, vol. 109(2), pages 124-127, November.

Pérez Pérez, Jorge. “City Minimum Wages.” City Minimum Wages, Jan. 2018, Jorgeperezperez.Com/Files/Jorge_Perez_Jmp.Pdf.