

The Effect of Cutting Unemployment Compensation Duration on Unemployment Rate and Wages

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Abstract: *To estimate the effect of a decrease in unemployment compensation duration on unemployment rate and wages, this paper utilizes a quasi-experiment and implements a difference-in-differences (DID) methodology to evaluate the impact of cutting unemployment compensation (UC) duration from 26 weeks to 20 weeks in 2012 on unemployment rate by comparing the treatment group, the Michigan state, with the adjacent control states, Indiana and Ohio. This paper also implements a Triple-D methodology to evaluate the effect of cutting UC duration across regions and categorizes each state in Metropolitan Areas (metro), Micropolitan Areas (micro) and countryside. Lastly, this paper tests the effect of cutting UC duration on average weekly earnings in 2012 using the same DID method in three major industries of the Michigan State, Manufacturing Sector, Goods-Producing Sector and Private Service Providing Sector. My results conclude that the cutting of UC duration decreases unemployment rate by 1.377 percentage points state-widely and has a larger impact on the metro areas compare with micro areas. My findings report that there was a decrease in wages by approximately 90 dollars in 2012 Manufacturing and Goods-Producing sectors.*

Keywords: Unemployment Compensation; Difference-in-Difference; Triple-D methodology.

1. INTRODUCTION, LITERATURE REVIEW AND THEORY

1.1 Introduction

Since 1936, unemployment compensation has always been one of the most far-reaching programs in the United States. This is because UC program is either a taxing program or a benefit payment program. It reaches a considerable amount of people in the United States, and its activities fluctuate with business conditions, not only favoring employers but employees as well. Unemployed workers whose unemployment state is not caused by their fault are entitled to enjoy temporary financial assistance that is provided in the form of unemployment insurance payments (benefits). However, since the 1970s and 1980s, the initial rise in unemployment and the occurrence of recession have led to many unemployed workers. They all lived on the unemployment compensation, which may have caused them to become less likely to find a job; therefore, the unemployment compensation attracts the attention of economists and policymakers. Recent days, more and more researches claim that the benefit of unemployment compensation is outweighed by the concerns it raised gradually in the United States. That is, an extension in the UC duration increases the unemployment rate and leads to a persistent unemployed situation.

Admittedly, the UI benefit has some benefits to the society. The primary benefit of UI is preventing workers from decreasing consumption caused by losses of their job (Fujita, 2010). Previous research of Gruber (1994) underscores the critical role of unemployment benefits in mitigating the severe effects of continuing declines in consumptions and helps maintain consumption smoothing. Macroeconomically, Chimerine et al. (1999) and Maggio and Kermani (2016) show the effect of Unemployment Insurance as an automatic stabilizer that could boost the development of the economy. From the benefits of UI/UC, it could be seen that individual consumption levels remain unchanged and economy is stimulated.

However, improper duration and eligibility also lead to adverse effects on unemployment. O'Leary and Wandner (1997) demonstrates that when unemployed workers intentionally to be eligible for receiving the unemployment benefit (or the duration of the benefit goes too long), this situation normally leads to a rise in the unemployment rate. Intuitively, workers get money from unemployment insurance when they are unemployed. Once they find a job, they are not entitled to get the benefits any longer. Consequently, some workers choose to remain unemployed for the purpose of continuously getting money from the benefit; therefore, raising the unemployment duration and the unemployment rate.

In addition to the short-run issues, a more long-run consequences, hysteresis or systemic long-run unemployment,

can be created. As suggested by Blanchard and Summers (1986), unemployed workers are more likely to remain unemployed when their skills become obsolete due to extended periods of being absent in the job market. As unemployment becomes acceptable, a less-skilled labor force will lead to a long term of low-level production and rate of employment. Therefore, increase in unemployment has a direct effect on the natural rate of employment.

Therefore, this paper investigates whether cutting UC duration decreases the unemployment rate by implementing a quasi-experiment. As of early 2012, the state of Michigan past Act No. 14, Public Acts of 2011, the act of decreasing the UC duration weeks from 26 to 20. However, its adjacent states Indiana and Ohio did not (Issacs, 2018). This paper investigates (i) whether a decrease in UC duration reduces the unemployment rate by comparing Michigan with its adjacent states; (ii) testing whether there are heterogeneous effects of UC on unemployment rate across regions for example, Metropolitan Areas (metro), Micropolitan Areas (micro) and countryside; (iii) whether a decrease in UC duration decreases wages for most workers by comparing Michigan and its adjacent states in three sectors including Manufacturing, Goods-Producing and Private Service Providing as these three sectors are the major industries in Michigan.

I will first go over some previous literatures on all the research questions that I am going to investigate and come up some basic theories based on previous literatures. Then, I will introduce my theoretical models (DID and Triple-D) and datasets used. Lastly, the regression results, policy implication with cost benefit analysis and limitations will be discussed.

1.2 Literature Review and Theory

Recently most kinds of literature continuously show that long-time provision of unemployment compensation potentially discourages the motivation for unemployed workers to find a new job and encourages employed workers to quit more often (Katz and Meyer, 1988; Farber and Valletta, 2015; Card and Levine, 2000). More literature shows that reducing UC maximum duration increases the motivation for job searching and improves employment. Most literature discover sizable and significant disincentive effects of the UI system through analyzing destinations from unemployment, such as job hunting. They find that when benefits are exhausted, the rate of finding a job will be substantially increased, and the shortened entitlement period of receiving benefits also highly enhances the probability of job finding (Van Ours and Vodopivec, 2006b; Mitman, Manovskii, and Hagedorn 2015; Johnston and Mas, 2018) Therefore, cutting the duration of the benefit decreased the unemployment rate.

In this paper, I am also going to investigate the effect of cutting UC on the unemployment rate in the Metropolitan and the Micropolitan areas. Although to my best knowledge, there is no paper specifically testing whether cutting UC duration has a more significant impact on Metropolitan Areas (metro) compare with the Micropolitan Areas (micro), there exists one previous literature of Jensen (1982) analyzing fringe benefits in both metro and nonmetro areas. They found that the underlying differences between the employment compensation practices in nonmetro and metro areas provide evidence that the structures of two labor markets are significantly different. The most apparent differences are population size, work sets, and diverse industries.

It is evident from the definition of metro and micro areas that the populations in these two areas are significantly different. Since the metro areas contain one or more counties that have over 500,000 inhabitants, the probability of jobs available in metro areas could be higher than those in micro areas. Because of the massive vacant positions provided in metro areas, it is easier for unemployed workers to find a job, although the job may not match their potential abilities. Workers in metropolitan areas will have broader and more profound work skills compared to workers in micropolitan areas. Therefore, workers in metropolitan areas will be less likely to be unemployed. Moreover, metropolitan areas with industry diversities will provide more diverse jobs for workers, and it will be easier for workers to find suitable jobs; however, in micropolitan areas with a more homogenous labor structure, workers who cannot find suitable jobs may choose to remain unemployed. As a result, supported by the advantage of greater population, experienced workforce and diversified industry, I am expecting that the unemployment rate decreases more in metropolitan areas than micropolitan areas when cutting the UC duration.

Further in my paper, I am going to investigate the effect of cutting UC duration on re-employed wages for the worker. From the above literature review, some point out that UI extensions have some effects on reemployment wages with typically negative point estimates while some find positive estimates (Ceneto and Novo, 2008; Nekoie and Weber, 2017). On the contrary, more studies provided evidence that the duration of unemployment benefits have no effect on the wages earned of both younger male and female workers, though it appears to extend their

unemployment duration (Ehrenberg and Oaxaca, 1976; van Ours and Vodopivec, 2006a). Not only in the U.S., but the most recent test conducted in France also supports the view that extension in benefit duration did not affect wages. The study of Le Barbanchon, Rathelot and Roulet (2019) pointed out that they cannot find any significant effects of potential benefit duration (PBD) on wages. Therefore, it is unclear whether reduction in UC duration will have a direct effect on wages. Theoretically, cutting the UC duration will motivate workers to find a job, but the job quality is hard to remain unchanged. It is more likely that workers are rushed to find a job lower than their potential; therefore, it leads to a reduction in wages.

Overall, this paper will first test the effect of cutting UC duration on the unemployment rate and wages at statewide level; second, test whether cutting unemployment compensation will have a larger effect on the unemployment rate across regions. Both tests will compare Michigan State with its adjacent states, Indiana and Ohio.

2. DATA AND METHODOLOGY

All data sets are obtained from the Bureau of Labor Statistics (BLS). I collected monthly labor force and unemployment data for Michigan, Ohio and Indiana from January 2009 to November 2019. It is countable that there are 12 monthly data for one state in a year except for 2019 with only 11 monthly data. Therefore, there are 131 (12*10+11) statewide monthly data each for Michigan, Ohio and Indiana at statewide, metro, micro and countryside level respectively. Table 1 and 2 show the distribution of the observations.

Table 2: Distribution of Observations across Regions and Times

State	Level	# of Observ. before Jan 2012	# of Observ. after Jan 2012	Total Observ.
Michigan	statewide	36	95	131
	metro	36	95	131
	micro	36	95	131
	countryside	36	95	131
Indiana	statewide	36	95	131
	metro	36	95	131
	micro	36	95	131
	countryside	36	95	131
Ohio	statewide	36	95	131
	metro	36	95	131
	micro	36	95	131
	countryside	36	95	131

Table 3: Distribution of Observations across Sectors

Sector	State	# of Observ. before Jan 2012	# of Observ. after Jan 2012	Total Observ.
Manufacturing	Michigan	36	95	131
	Indiana	36	95	131
	Ohio	36	95	131
Goods Producing	Michigan	36	95	131
	Indiana	36	95	131
	Ohio	36	95	131
Private Service Providing	Michigan	36	95	131
	Indiana	36	95	131
	Ohio	36	95	131

This paper uses a quasi-experimental difference-in-differences regression model exploiting the effect of unemployment compensation duration on the unemployment rate at the statewide level.

$$Unemployment_Rate_{it} = \alpha + \beta_1 Post_t + \beta_2 Treatment_i + \beta_3 Post_t * Treatment_i + \beta_4 X_{it} + \Lambda_i + \epsilon_{it} \quad (1)$$

where $Unemployment_Rate_{it}$ represents the unemployment rate of workers in states of Michigan, Ohio and Indiana from 2009 to 2019. $Treatment_i$ is a dummy variable that equals 1 if an individual lives in Michigan and 0 if elsewhere. $Post_t$ is a dummy variable equal to 1 when time after and 0 when time before. $Post_t * Treatment_i$ represents the interaction term, which is the DID coefficient measuring the pure effect

of cutting unemployment compensation duration on unemployment rate. X_{it} includes control variables that varies within 2009 to 2019. Λ_i represents individual fixed effects and can control for time invariant variables at the individual level such as gender and race. ϵ_{it} is the error term. We rely on the assumption that these states have experienced the same economic, demographic, and social changes that could have affected unemployment compensation duration and unemployment rate. Therefore, by constructing this DID model, the robust model should show the effect of cutting in unemployment compensation duration in Michigan on the unemployment rate at the statewide level. The same DID model applies when testing the effect of cutting UC on wages across states.

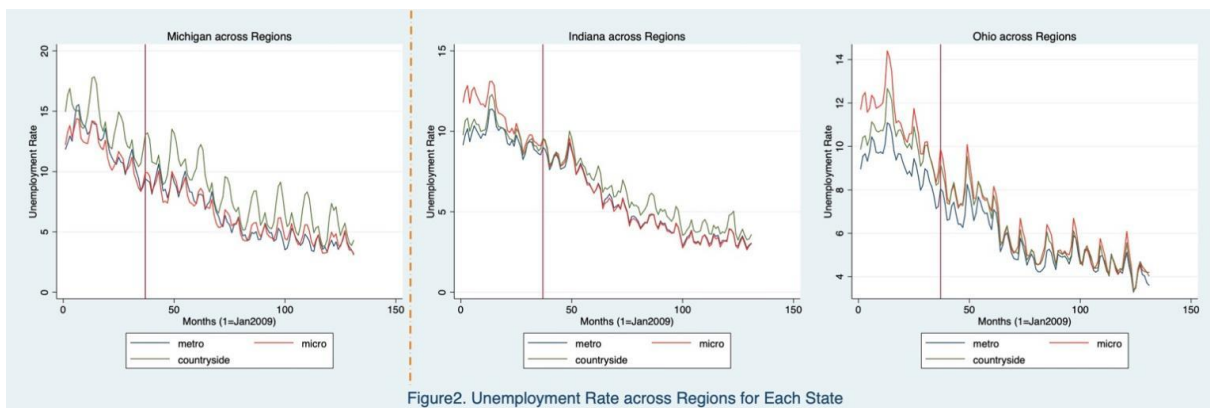
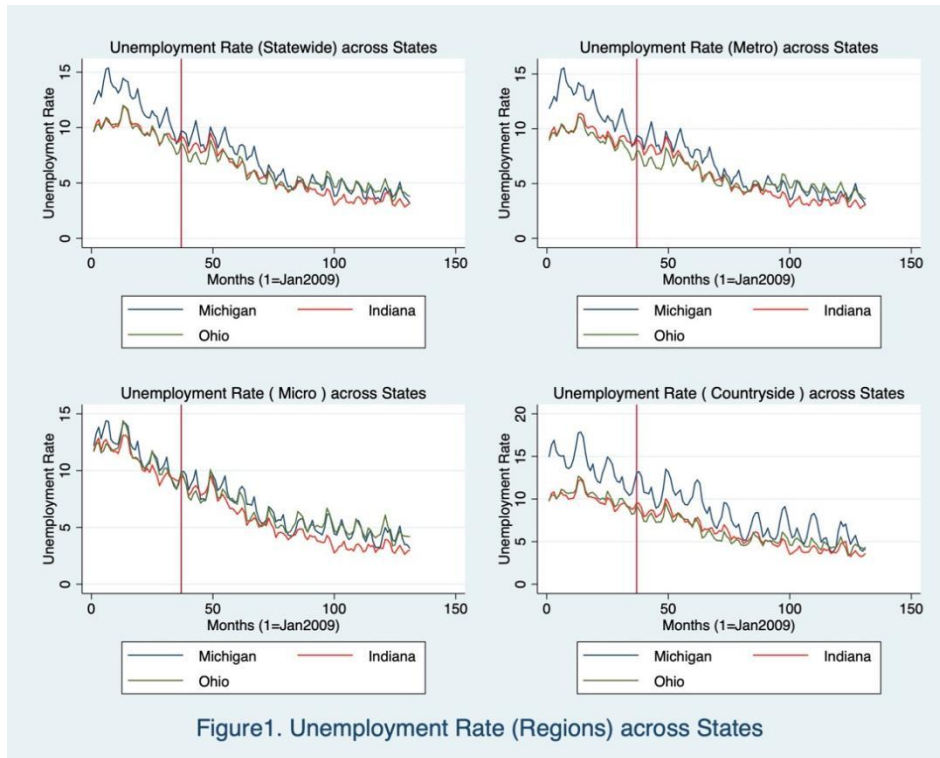
When it comes to investigate whether there are heterogenous effects across regions including Metropolitan Areas, Micropolitan Areas and countryside. With the same assumption applied, the Triple Difference model is now used and I am going to compare Metro, Micro and countryside pair-wisely as it would be easier to see the results.

$$\begin{aligned}
 & Unemployment_Rate_{it} \\
 & = \alpha + \beta_1 Post_t + \beta_2 Treatment_i \\
 & + \beta_3 Level_i + \beta_4 Post_t * (Treatment_i) + \beta_5 Post_t * (Level_i) \\
 & + \beta_6 Treatment_i * (Level_i) + \beta_7 Post_t * Treatment_i * (Level_i) \\
 & + \beta_4 X_{it} + \Lambda_i + \epsilon_{it}
 \end{aligned} \tag{2}$$

In order to see whether the cutting of UC Duration (from 26 weeks to 20 weeks) is effective visually, I draw graphs for unemployment rate before and after January 2012 across regions, comparing states. Figure 1 shows the graphs of unemployment rate by comparing different regions across states. Both the treatment and control groups are evolving at the same trend before January 2012 (the vertical red line represents January 2012). This indicates that this is an efficient random quasi-experiment. It could be seen that Michigan has a higher unemployment rate before January 2012 than Indiana and Ohio and the difference in the unemployment rate between the treatment group (Michigan) and the control group (Indiana and Ohio) has been shortened after the implementation of the law of cutting UC duration at statewide, metro and countryside level. However, similar graph does not show in Micro areas across states. It could be seen in micro areas across states, the difference in the unemployment rate between the treatment and control groups does not shortened after January 2012. This seems that the policy is not effective in micro areas of Michigan.

Figure 2 shows how the heterogeneous effects of unemployment rate across regions for each state. Michigan state as the treatment group has the highest unemployment rate before and after Jan 2012 in the countryside compare with Metropolitan Areas and Micropolitan Areas. The difference across regions remain unchanged after the implementation of cutting UC duration. However, both control groups of Indiana and Ohio has the largest unemployment rate in Micropolitan Areas before January 2012 and decreases after January 2012. It is not obvious from the graph whether there are more significant effects of cutting unemployment rate comparing metro, micro and countryside pair wisely. The empirical results will show the detailed results.

Figure 3 shows the effect of cutting UC duration on wages for each industry. It could be seen that both the Manufacturing and the Goods-Producing Sectors evolves at the same pattern while the Private Service Providing Sectors does not. It could be seen that the gap between Michigan state and Indiana and Ohio State decreases after January 2012 in both Manufacturing and Goods-Producing Sectors. However, nothing changed in Private Service Providing Sector.



3. EMPIRICAL RESULTS

Results of the DID and Triple-D model are presented in Table 3. Table 3 shows that, with a policy of cutting UC duration from 26 to 20 weeks, Michigan has a significantly decrease in the unemployment rate by 1.37 percentage points compare with Indiana and Ohio States. The results of a Triple-D regression when comparing metro with micro is significant. The unemployment rate of the metros decreases further by 1.823 percentage points than micros with a cutting in UC when compare with the adjacent states, Ohio and Indiana. When comparing metro areas with countryside, although the coefficient shows a decrease in unemployment rate of 0.248 percentage points in the metro areas of Michigan, the result is not significant when comparing with Ohio and Indiana. When comparing countryside with micro areas, the cutting UC significantly decrease the unemployment rate further by 1.574 percentage points in the countryside of Michigan than micros comparing with Ohio and Indiana.

Table 3: DID and Triple-D Regression Results for Unemployment Rate with Controls

	Statewide	Metro vs. Micro	Metro vs. Countryside	Countryside vs. Micro
Coefficients	-1.377*** (0.223)	-1.823*** (0.548)	-0.248 (0.560)	-1.574*** (0.564)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In order to test the effect of cutting unemployment duration on wages of the most workers, I compare average weekly earnings of workers in Michigan with Indiana and Ohio in three major industries separately (Manufacturing, Goods-Producing and Private Service Providing). The reason for not combining them is that the mean wages are extremely different across sectors. Combining three sectors will bias the results. Table 4 shows the coefficients for cutting unemployment compensation on average weekly earnings of all workers in three Sectors, while comparing with Indiana and Ohio. For the Manufacturing industry, the interactive term shows that the policy of cutting UC duration, significantly decreased by 98.55 dollars the average earnings of workers in Manufacturing sectors in Michigan compared to control states. For the Goods-Producing Industry, after the policy of cutting UC duration from 26 weeks to 20 weeks implemented in Michigan, the average weekly earnings of workers significantly decrease by 90.38 dollars compared to the control states. For the Private Service Providing sector, the interactive term shows that after the policy of cutting UC duration from 26 weeks to 20 weeks implemented in Michigan, the average weekly earnings of workers decrease by 9.4 dollars and it is not significant.

Table 4: DID and Triple-D Regression Results for Wages with Controls

	Manufacturing	Goods-Producing	Private Service Providing
Coefficients	-98.55*** (11.27)	-90.38*** (11.37)	-9.416 (9.933)

Standard errors in parentheses

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

While examining three different major sectors in the Michigan and find diverse results in my regressions, the explanation for these results could be various. The distribution of workers who worked in Manufacturing sectors and Goods-Producing sectors may be different from that of Private Service Providing sectors. Workers in Manufacturing sectors may mostly live in Metropolitan Areas and workers in Private Service Providing sectors may mostly live in countryside and Micropolitan Areas and vice versa. Additionally, it is possible that most people in the Private Service Providing sector are the owner of their own business or family business that are not affected by the UC. These factors can all affect the changes in wages of workers in different sectors.

4. POLICY IMPLICATION

Based on the previous result, I would like to conduct a brief cost and benefit analysis to see whether cutting UC is beneficial to the US. State widely, the benefits can be broken down into two sections: consumption and social benefits. We are able to show results consistent with the literature, that decreasing the duration of unemployment compensation decreases the rate of unemployment by 1.377 percentage points. According to the source (LAU statistics), the labor force of Michigan state in January 2012 is 4614170 and the unemployed are 448,321, which is originally 9.7% of the labor force. Now because of the 1.377 percentage points of the labor force are now becoming re-employed. This means because of this policy implementation, 63,537 (1.377%*4614170) people become re-employed and the government in the Michigan state are no longer needed to pay the 6 weeks more weekly benefits to them. According to the report by Holland (2012), the maximum weekly benefit amount (WBA) in the Michigan state is \$362 and the average WBA in 2012 is \$296.62. Therefore, the government could save \$138,002,364 (63537*362*6) in maximum and on average \$113,078,070 (63537*296.62*6).

Now, the production and GDP would increase because of these people get back to work. Assuming each of them are taking the minimum wage of Michigan in 2012, which is \$7.40, an increase of minimum of \$470,173.8 (7.40*63537) will have on production. Now, assuming each of them are taking the median wage of Michigan in 2012, which is \$16.50, an increase of approximately \$1,048,360.5 (16.50*63537) will have on production. These numeric estimations show that because these workers are re-entering the labor force at a high rate, they are able to produce, consume and contribute to the economy. Additionally, the social benefit that derived from them are certain but difficult to calculate.

Since this paper also shows the effect of cutting UC across regions including metro, micro and countryside. The improvement in labor structure because of this policy is also different. The different labor structure between rural and urban areas are also needed to take into consideration. In metro areas where includes most industries and higher populations, we proved that decrease in unemployment rate will be larger than micros (significantly) and other areas (insignificantly). We have shown that metro areas have an approximately 1.8 percentage points decrease in unemployment rate compare to micro. According to the source (LAU statistics), the labor force of metro areas in Michigan state in January 2012 is 3,774,527 (which is 81.8% of the state labor force) and the unemployed are 355,132 (which consist 79.2% of the state unemployed), which is originally 9.41% of the metro

labor force. Now because of the 1.8 percentage points of the metro labor force are now becoming re-employed. This means because of this policy implementation, 67,941 ($1.8\% \times 3774527$) people become re-employed. Similarly, an increase of minimum of \$502,766 (7.40×67941) will have on production based on the minimum wage (\$7.40) and an increase of \$1,121,026 (16.50×67941) will do based on the median wage (\$16.50). Therefore, firms can produce outputs more cheaply benefiting the who society because of the higher labor supply and lower wages.

However, we also need to take into concern about the wages decrease in different industries. My results show that in manufacturing industry in Michigan, the average weekly earnings of each worker in that industry decrease by \$98.55, which is decreasing by \$2.47 ($98.55/40$) per hour, assuming working for 8 hours per day and 5 hours per week. In January 2012, there are 521,000 workers in manufacturing sectors and assume each of them facing a decrease in wages by \$2.47, Michigan state will be facing a loss of \$1,286,870 (2.47×521000). Non-numerically, the government will face the problem of job allocation and people in countryside may remain unemployed. Therefore, the external cost and social loss because of these needed to be calculated as well.

5. LIMITATIONS AND CONCLUSIONS

Nevertheless, there are many limitations to this work. As I discussed in the Methodology part, the critical assumption of the DID and Tripe-D regression is that these states have experienced the same economic, demographic, and social changes that could have affected unemployment compensation duration and unemployment rate and wages. If this is true then we can see that before January 2012, the treatment (Michigan) and control groups (Ohio and Indiana) should evolve at a same pattern. This assumption is true in Figure 1 and Figure 2, but in Figure 3, the average weekly earnings for each state is not evolve at a same pattern, especially for Goods-Producing and Private Service Providing industry. Therefore, the assumption of regression on wages is not robust.

Apart from the assumptions, the individual fixed effects are not controlled. The gender of the unemployed workers is not separated, and there may be biased results if we conduct the experiment based on gender. It also did not control for omitted variables that might affect worker's decision to supply their labor, such as their level of education and their races. From the perspective of time effects, there may be other time varies factors that affect workers' decisions, and their employment level needs to be added. As a result, the model could be improved by adding more controls for individual and time fixed effects.

The problem of external validity needs to be considered, the research results in Michigan may not applicable to New York state as labor structure varies. The confidence interval of the results may change if apply to other states in the United States. Although in a same state, different people in different class receives different type of unemployment benefit based on their previous payment. All these varies have not been considered and needs to be controlled.

In this study, I first test the effect of cutting unemployment compensation on unemployment rate across regions. While comparing the effect of cutting UC at the statewide level, I find that with month and state controls, the unemployment rate decrease by 1.377 percentage points. Across regions, cutting unemployment compensation decrease more unemployment rate in Metro areas compare with Micro areas (1.823 percentage points) and decrease more in countryside than Micro areas (1.574 percentage points). They are all statistically significant differences. I then test the effect of cutting UC on wages for three major, different industries. Cutting UC decrease wages by 98.55 dollars in Manufacturing sectors and 90.38 dollars in Goods-Producing industry respectively and no effects on Private Service Providing industry.

Knowing on some interesting findings other than the regression results, I have some suggestions for future studies. First, across regions, although my results show that the decrease in unemployment rate is higher in metro comparing metro with micro, it is somehow confusing why the decrease in unemployment rate is higher in countryside than micro areas. Based on the theory in literature review, the decrease in unemployment rate should follow the pattern that most large in Metros, then micros and the last, countryside. I suggest more investigation of my findings showing that the countryside is more affected than micro areas.

Second, tourism is the one of the largest industries in Michigan, I have included tourism in private service providing. However, from my regression, the result is not significant. Therefore, specified occupations in Private Service Providing could be further discussed. Additionally, average weekly earnings I used for each industry is the mean wage for all employees, including the highest and the lowest wages. This may bias the results as there

are too many different occupations within more specific industry. Therefore, occupations might be another variable that may affects the testing of the effect of cutting UC on wages.

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