Causal Project

Calls to increase the federal minimum wage to $15 an hour has gained traction in recent policy debates in the United States, propelled by the fact that the last increase occurred in 2009 to the current $7.25. Although the minimum wage has no kept up with inflation, the debate revolves around the impact that an increase in the Federal minimum wage will have on employment. Some policy makers believe that there will be a negative short-run and long-run effect, whereas others believe there will only be a negative short-run effect, and some argue that there will be no negative impacts whatsoever. The issue is that, unlike some other policy debates, there is evidence that supports the claims made by both sides. In fact, since Card and Krueger's (1994) study, there is not even a consensus among economist on how to measure or study the effect of minimum wage increases. Some researchers have only focused on the impact on teen employment (Allegretto et al. 2017, Callaway and Sant'Anna 2020), whereas others have focused only on specific sectors (authors and what not), and others have focused on the overall population (authors and whatnot).

One of the most interesting arguments supporting the minimum wage increase is that an increase in the minimum wage will lead to a decrease in overall crime rates as claimed by the Council of Economic Advisors (2016). The theory behind the claim is that an increase to the minimum wage will increase the opportunity cost of committing a crime, as the criminal could be earning more by having a minimum wage job that committing crime. Notwithstanding that this argument relies on the fact that there will be no negative effect on employment, the economic theory is intuitive for two reasons. The first is that, since the federal minimum wage has no kept pace with inflation, an increase in wage means that the worker has more disposable income to sustain themselves, thus they do not need to find another source of income, such as committing property crimes, to acquire their necessities, for example diapers. The second reason is that it also increases the cost of crime if the criminal gets caught, as the time they spend in jail/court they could have spent working and earning. However, there are two issues with this argument. The first is that the cost of crime might not have increased, rather it might have decreased. Assuming that there is no loss in employment, its own thorny issue, people's income have increase, therefore they buy more goods, that they previously could not afford, or they carry more cash on themselves. In either case, people whose minimum wage has increased are now "richer" targets and might offset the increase in cost of committing crime mentioned earlier and even decrease it. The other issue is that an increase in the minimum wage might lead to a decrease in employment thus pushing workers into committing crimes, either due to "teen idleness" or as alternative source of income. Again, just like the literature concerning the impact of minimum wage increases on employment, there is no clear evidence to support or refute the claim that minimum wage increase will decrease crime. Hashimoto (1987) managed to estimate a time series regression and found that increases in the federal minimum wage are positively correlated with property crimes committed by teenagers. Beauchamp and Chan (2014) also found positive evidence of a positive correlation with property and violent crimes committed by teenagers, but there is a negative correlation with young adults. Therefore, just like the literature on minimum wage and employment, there is no clear result.

By using the Federal Bureau of Investigation's Uniform Crime Reporting (UCR) program and a new research method developed by Callaway and Sant'Anna (2020), this paper seeks to make contributions to the existing literature on the direct effect of increasing minimum wage on overall crime rates in an attempt to clarify the effects.

Describing the Data and Methodology

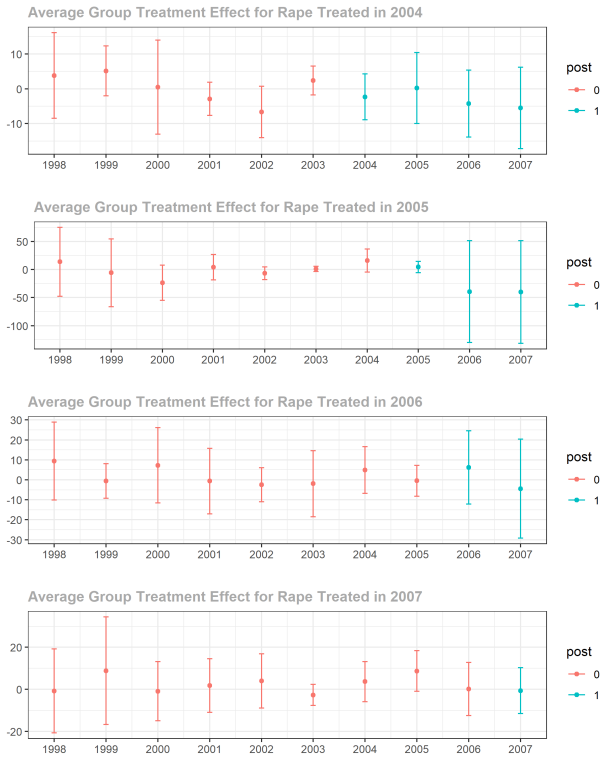
The primary data source for this paper is the UCR provided by NAME OF PRESON containing the criminal arrest rates by counties in all 50 states plus D.C. from 1997 to 2007. However, following Callaway and

Sant'Anna (2020), I will only be looking at 29 states. The UCR collects the number of offenses that have come to the attention of law enforcement for violent and property crimes, as well as data concerning clearances of theses offenses that is not used in this paper. The FBI defines violent crimes as offenses that involve force or threat of force, whereas property crimes do not. The offenses that I will be paying particular attention to are murder, manslaughter, rape, robbery, burglary, larceny and vehicle theft.

In order to perform the analysis, I will be using the method proposed, and created by, Callaway and Sant'Anna (2020) called the difference-in-difference with multiple time periods, instead of a regular difference-in-difference (DID) method. As I am considering a time period from 1997 to 2007, a period where the federal minimum wage had remained at $5.15 an hour, there have been come states that have increased their minimum wage throughout this period, mostly occurring a couple of years before the 2009 federal minimum increase. The states that have seen an increase in their minimum wage are part of the treated group, whereas the states that have not changed their minimum wage paper are part of the untreated group. The states that have not changed their minimum wage but had a higher state minimum wage have been dropped from the data, thus leaving only 29 states to be observed. The reason that a DID method is not recommended in this case study is because states that have increased their minimum wages have done so at different times. The DID method requires two time periods and two groups – in period one no one is treated, in period two one group is treated and the other is not – to allow us to estimate the causal effect. The Callaway and Sant'Anna method allows for a difference-in-difference method to be used over multiple treatment time periods. As I am replicating Callaway and Sant'Anna's paper but focusing only on crime rates, it is important to note that my data set is looking overall crime rates at the state level, not the county level. Based on current literature, and economic theory, I suspect that we will see that there are no statistically significant effect of minimum wage increases on non-financially motivated crimes (rape, manslaughter, murder) and statistically significant positive effects on financially motivated crimes, meaning that crime rates for these types of crimes will increase.

Performing the Analysis

Non-Financially Motivated Crimes



As we can see in the above graph, there is no statistically significant effect of minimum wage increases on the number of rapes per capita. In fact, there are no statistically significant effect on any of the other non-financially motivated crimes, as theorized. These results are rather surprising due to the nature of the crime, they were committed with the intent to harm. The only way for there to be a statistically significant effect is if a significant number of these violent crimes are "escalation of crimes", meaning that these non-financially motivated crimes started off as financially motivated crimes. For example, a criminal committing a crime of burglary gets startled and accidentally kills the homeowner. He is arrested for, and the crime is reported as, murder. In this scenario, the criminal escalated the criminal act of burglary to murder without intending to do so. Therefore, if there was a significant increase in the number of burglaries and an increase in the number of murders, then it could be theorized that the minimum wage increase has indirectly positively affected the murder rate by increasing the number of burglaries. However, this would be assuming that there is statistically significant effect on both non-financially and financially motivated crimes. For now, the only conclusion that can be made is that increases to the minimum wage does not affect non-financially motivated crimes.

In contrast to the lack of statically significant effects on non-financially motivated crimes, there is some evidence of positive effects of increases of the minimum wage on financially motivated crimes. As shown in the plots below, larceny has two group-time average treatment effects that are statistically different from 0, whereas vehicle theft, burglary and robbery have one. This seems to provide evidence refuting the claim that increases to the minimum wage will decrease crime by increasing its opportunity cost. However, it is unclear from the plots whether this is due to the victims are considered "wealthier" or if the criminals were pushed into committing crimes due to a loss of employment. What is interesting is that the small number of group-time average treatment effects that are statistically different from 0 seems to suggest that the aggregated group-time average treatment effects are going to be statistically insignificant.

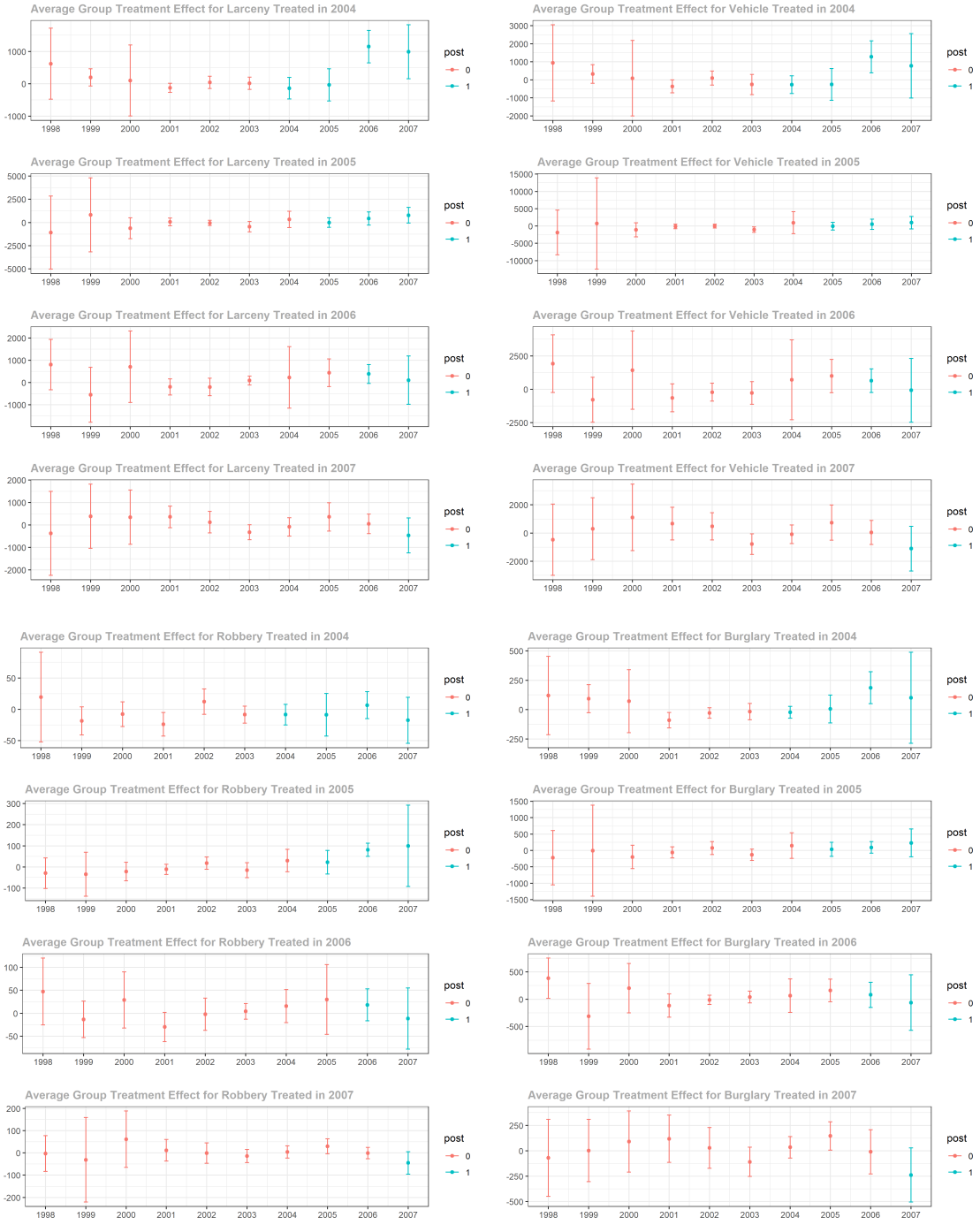
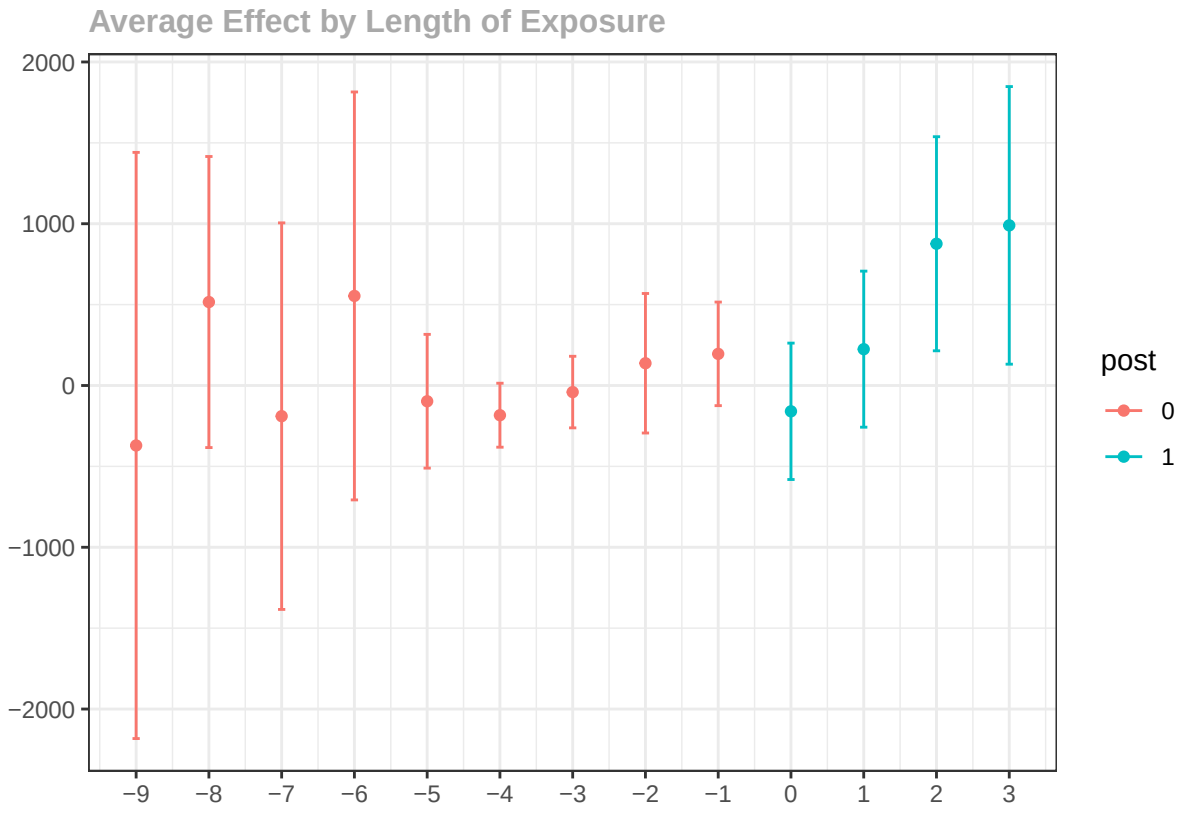
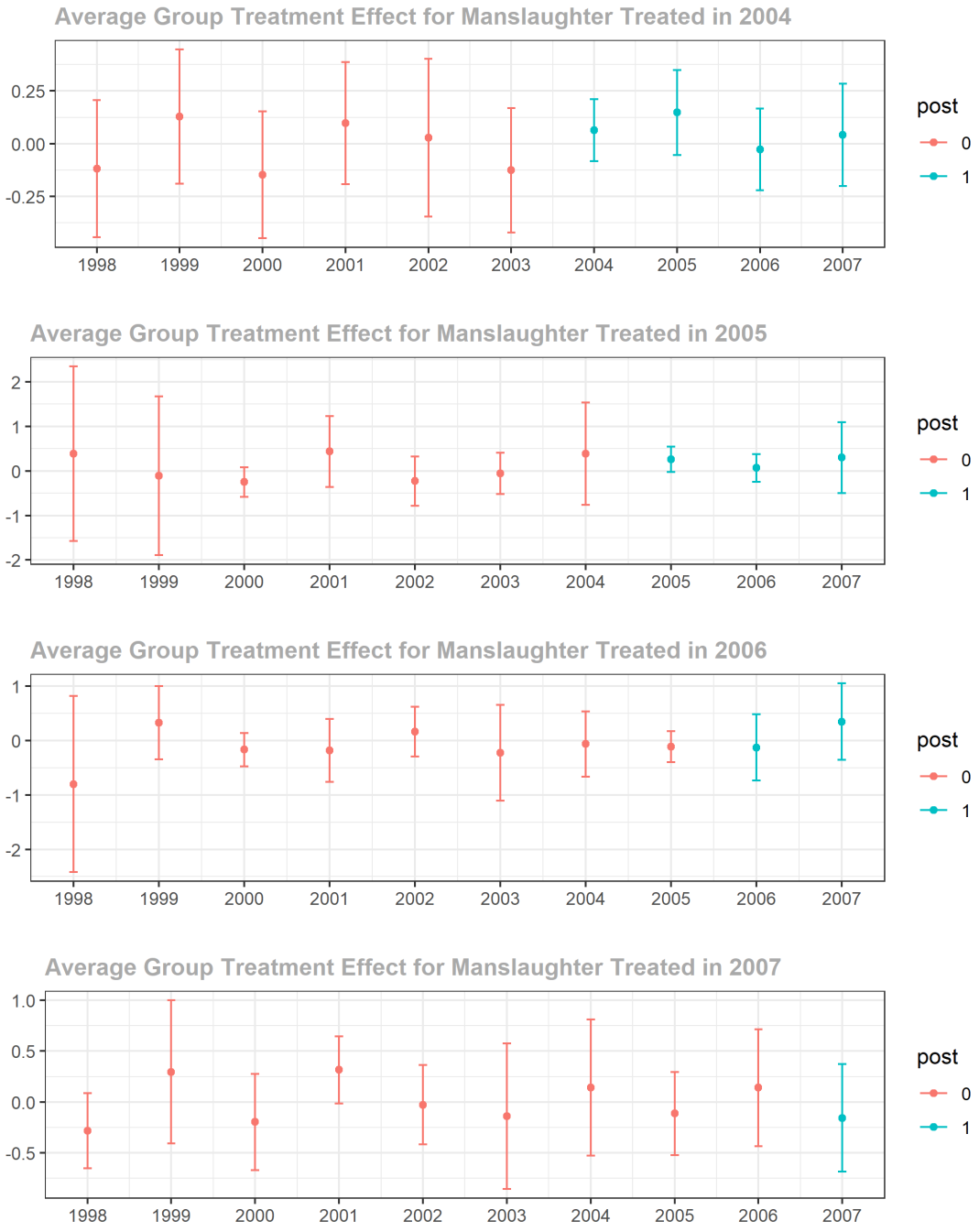

Average Group Treatment Effect for Larceny Treated in 2004
Average Group Treatment Effect for Vehicle Treated in 2004
Average Group Treatment Effect for Larceny Treated in 2005
Average Group Treatment Effect for Vehicle Treated in 2005
Average Group Treatment Effect for Larceny Treated in 2006
Average Group Treatment Effect for Vehicle Treated in 2006
Average Group Treatment Effect for Larceny Treated in 2007
Average Group Treatment Effect for Vehicle Treated in 2007
Average Group Treatment Effect for Robbery Treated in 2004
Average Group Treatment Effect for Burglary Treated in 2004
Average Group Treatment Effect for Robbery Treated in 2005
Average Group Treatment Effect for Burglary Treated in 2005
Average Group Treatment Effect for Robbery Treated in 2006
Average Group Treatment Effect for Burglary Treated in 2006
Average Group Treatment Effect for Robbery Treated in 2007
Average Group Treatment Effect for Burglary Treated in 2007
post
0
1

Table 1: Minimum Wage Aggreagted Treatment Effect Estimates

	Violent Crimes			Non-Violent Crimes			
	Murder	Manslaughter	Rape	Vehicle	Robbery	Larceny	Burglary
Overall ATT	-1.478	0.103	-13.414	379.817	0.103	482.794	58.842
95% CI	(-1.05,0.31)	(-0.024, 0.076)	(-9.37, 2.67)	(-165.03, 354.94)	(-4.37, 13.57)	(14.11, 227.28)*	(-37.72, 67.14)



Appendix


Average Group Treatment Effect for Manslaughter Treated in 2004
0.25
0.00
-0.25
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1
Average Group Treatment Effect for Manslaughter Treated in 2005
2
1
0
-1
-2
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1
Average Group Treatment Effect for Manslaughter Treated in 2006
1
0
-1
-2
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1
Average Group Treatment Effect for Manslaughter Treated in 2007
1.0
0.5
0.0
-0.5
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1


Average Group Treatment Effect for Murder Treated in 2004
2.5
0.0
-2.5
-5.0
-7.5
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1


Average Group Treatment Effect for Murder Treated in 2005
4
0
-4
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1


Average Group Treatment Effect for Murder Treated in 2006
15
10
5
0
-5
-10
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1


Average Group Treatment Effect for Murder Treated in 2007
4
0
-4
-8
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
post
0
1