

Time Series Analysis of Traffic Accidents to Explore the Effect of the 2016 Kumamoto Earthquake

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Abstract

After natural disasters, drivers are forced to drive in stressful situations, and the number of traffic accidents may increase. After the 2016 Kumamoto earthquake, many evacuees stayed overnight in their cars, after which their driving would have suffered because of the fatigue from that situation. However, few studies have examined this issue. Taguchi et al. (2008) investigated the issue, but their analysis was preliminary one. Their data was limited in time and space; their data was of 27 municipalities out of 49 municipalities in Kumamoto prefecture from 2015 to 2017.

This study extends the work by Taguchi (2008) using the traffic accidents data provided by Kumamoto prefectural police in all 49 municipalities in Kumamoto prefecture from 2013 to 2018, and reveal the change in the number of traffic accidents after the 2016 Kumamoto earthquake. This study also extends its method by using time series analysis. We examined traffic accidents resulting in injury or death separately from those resulting in property damage. We found that 1) the number of accidents resulting in injury or death decreased, despite the earthquake, but that accidents resulting in property damage increased after the earthquake; and 2) the number of accidents resulting in property damage increased even more in the more heavily damaged areas. Although this study is based on aggregated macro data, an investigation using micro data will be effective in revealing useful findings in a future work.
