

Understanding the Impact of a Recent Hurricane on Mobilization Time During a Subsequent Hurricane

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Abstract

It is not uncommon for a region to be affected by multiple hurricanes in a span of a few weeks. The behavior of the evacuees during a subsequent hurricane in the same season is affected by the damage to the infrastructure and to the vehicles and assets belonging to evacuees, as well as by the psychological impact of the preceding hurricane. One such behavioral aspect that affects traffic-loading rates during a hurricane is the evacuation delay or mobilization time. In this study, "mobilization time for an evacuee" is defined as the difference between the time at which the decision to leave is made and the actual time of departure. This paper proposes a methodology that can be used to understand the factors associated with the mobilization time during a subsequent hurricane while accounting for the effects of the preceding hurricane. The effects of the preceding hurricane were accounted for by modeling mobilization times simultaneously with an ordinal variable representing evacuation participation levels during Hurricane Charley. The data from a survey conducted with the evacuees of Hurricane Frances, which made landfall 3 weeks after Hurricane Charley, were used in this study. The errors for the two simultaneously estimated models were significantly correlated. The results showed that home ownership, the number of individuals in the household, income levels, and the level or the risk of a surge were significant in the model and explained the mobilization times for households. Pet ownership and the number of children in households, known to increase mobilization times during isolated hurricanes, were not found to be significant in the model. The implications of these findings for the demand S-curve are briefly discussed.