Car Fleet Composition

The structure of a local car fleet is likely to be contingent on a number of situational factors that make the ownership and use of certain types of car more or less suitable. These situation factors cover such issues as the socioeconomic characteristics of the resident population, the features of the transport system, and the presence of policies designed to promote or hinder particular car types. At a general level, the rate of car ownership and its association with household income has been examined (Clark, 2007; Clark and Finley, 2010), with substantial differences in income elasticity levels across regions found to be present, indicating that a link between car ownership and income is spatial non-stationary. Changes in the rate of car ownership in particular areas have also been found to be moderated by the rate of ownership observed in neighbouring areas (Clark and Rey, 2017), indicating that transitions between levels of ownership are effected by wider environmental contexts.

Recently, research has expanded into investigating the geographical variation in the different types of car that are owned. Car body type (e.g. salon, hatchback, and sports) represents a visibly distinctive characteristic of the local vehicle fleet, with certain chassis designed with particular environments in mind. Adjemain et al. (2010) examined the occurrence of car body types across census tracts of California and found that such factors as income level, education level, age profile, ethnic makeup, and marriage status of the population are useful in explaining the presence of certain car variations. Moreover, their analysis demonstrates that ownership rates of pickup trucks, station wagons, and sports utility vehicles tend to be spatially dependent, whereby the rates in one area are connected with the rates displayed in neighbouring areas. This spatial dependence could be generated by social conformity, by which preferences for car body type are informed by the popularity of body types in the wider region. This premise is supported by the work of Lansley (2016), whose examination of car body type across the neighbourhoods of the UK found that certain types of vehicle were connected with particular socioeconomic classes, such as the rate of luxury car ownership being associated with the rate of the population in managerial or professional employment.

The prevalence of different powertrains within local fleets has also been investigated to determine what conditions are linked to registrations of alternatively fuelled cars. The rate of Hybrid Electric Vehicles (HEVs) (Dimatulac and Maoh, 2017; Liu et al. 2017) has been found to be associated with the education and income levels of the population as well as car availability levels, commuting distances, and household size. In terms of the presence of local supporting policies, the exemption of HEVs from the London Congestion Charge has been found to represent a salient issue in consumer’s decisions to purchase a HEV (Ozaki and Sevastyanova, 2011), with Morton et al. (2017) finding that the rate of HEV ownership tends to increase as the rate of commuting by car to the London Congestion Charge increases. Similar assessments have been conducted on the exemption of natural gas vehicles from the Stockholm Congestion Charge, where Mannberg et al. (2014) applied a difference-in-difference assessment across Stockholm and Gothenburg (used as the control site) and identified a 1.2% increase in registrations of natural gas vehicles in Stockholm attributable to the exemption. Providing further evidence of this effect, Whitehead et al. (2014) developed a vehicle choice model for car registrations in Stockholm and simulated a scenario omitting the presence of the natural gas vehicle exemption, with the policy estimated to have increased the registration rates of these vehicles by 1.8%. These studies endorse the view that proximity or nearness to a policy which benefits one particular car variant (such as a certain powertrain) can encourage the registrations of such vehicles in surrounding areas. The research reported in this paper examines if such an effect is present in terms of fuel tourism between Northern Ireland and the Republic by evaluating whether the availability of cheaper diesel fuel in the Republic is promoting registrations of these vehicles in Northern Ireland.