

Paper Review : Electric vehicles and fuel vehicles: An empirical analysis

Around the 19th century, electric vehicles (EV) were invented as an alternative to combustion vehicles. With the advancement of the technology it came into the spotlight and demand has built up massively and intensely in the city area but with the cheap supplement of the fuel vehicle, gasoline, the demand of electric vehicles has diminished overtime and has been dominated by fuel vehicles. In the late 20th century, there was a shortage in gasoline and the price has risen. Combined with the environmental concern idea, electric vehicles got the market attention back once again. This paper examines emission from driving fuel vehicles and charging electric vehicles via an econometric model to visualize and analyze the effect of each type of vehicle in the cost creation dimension. There are 2 core questions in the paper: firstly, in terms of emission costs that it creates, can the electric vehicles be the replacement of fuel vehicles, and secondly, is it true that in urban areas the electric vehicle will be more effective. Motor vehicles has been well known as the cause of pollution and electric vehicles are recommended instead. From the previous study, external costs were less created by electric vehicles but the cost of electric vehicles might be more than the benefit that is introduced. Meanwhile, fossil fuel has economic benefits but it creates environmental costs.

The data used in the paper were taken from one of the research paper of American Economic review and has been collected during 2010 to 2014 including records of different vehicle models in every state of the USA which can be classified into 20 fuel vehicles models and 11 electric vehicles models. But in this paper only 6 chosen states were included in the analysis which is California, Florida, New York, Georgia, Kansas and Montana. Demographic data were taken from the United State Census Bureau, also the locations of power plant were taken from Global Energy Observatory (GEO) websites. In 6 states there are 507 cities which will be the observation model. There are 4 econometric models in this paper and consisted of 5 variables: fuel cost, electric vehicle cost, income per household, high school graduation percentage, and cities population and 9 dummy variables: urban area, coal power plant, gas power plant, geothermal power plant, hydro power plant, nuclear power plant, oil power plant, waste power plant and wind power plant. Model 1, 2, 3, and 4 have marginal damage, fuel cost, electric vehicle cost and total damage as dependent variable, respectively.

The result is that fuel vehicle increase marginal damage by 103.9% meanwhile electric vehicles decrease marginal damage by 89%, so electric vehicles create less environmental damage by 14.6%. On the other hand of the demographic results, model 2 and model 3 suggests that electric vehicle is more beneficial in the urban area, people creates more emission along with their income creation but higher educated people have more environmental concern which can reduce the marginal damage. So in conclusion, in various dimension that electric vehicle is better than fuel vehicles and have all the abilities to be the vehicles of the future.

This paper have illustrated clearly of the writer's interest in the topic and have mentioned the history related to the topics and describe how important it is that these questions needed to be answered. Paper review were thorough about the topic and the results of previous studies were suggested the same as this paper suggestion. Methodology were described in detail and all the variables were mentioned transparently and presents the correlation of the variables towards the model. The result has been analyzed according to the result of the model and also stated clearly of the implications of the results.