

A conceptual illustration of urban mobility. A child with a backpack stands on a large paper airplane, looking through binoculars at a cityscape below. Various icons representing different modes of transport (train, bus, bicycle, car, etc.) and a large 'P' for parking are arranged around the child, all set against a blue sky with clouds.

FACTORS AFFECTING PARKING DEMAND

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Analysis of the parking demand for Q-Park car parks in Rotterdam

This paper sets out to explain the factors affecting parking demand. Specifically, the case of Q-Park in the city of Rotterdam is examined, in order to see what factors affect the number of cars leaving the car parks, as well as parking duration. This is done by distinguishing between internal factors, under the control of the parking operator, and external factors, which are determined by the outside environment. The study of these factors will allow to see what factors parking operators should consider to be important in their business, as well as how these can be used to reach company specific goals or objectives.

Literature review

The first step is the literature review, which highlights the study of parking price elasticity, as the main internal factor affecting parking demand. Research finds that price elasticity changes occur over time, and hence the necessity of considering these effects is highlighted.

Furthermore, **price elasticity is found to be inelastic for parking demand**. With regards to external factors, literature on the matter is quite scarce, and hence reasoning is used in order to come up with external factors that may have an effect on parking demand. These are concluded to be location desirability, built up from several indicators, as well as income.

Data from Q-Park and the city of Rotterdam

Next, data from Q-Park is used to account for the internal factors, while data on the external factors is collected from the city of Rotterdam database. This data is determined to fit a panel data analysis, and hence the fixed effects Error Correction Model is constructed.

This model is able to estimate the short run and long run effects of each variable, and is estimated for the number of cars leaving on weekdays, number of cars leaving on weekends, and parking duration.

The model finds **price elasticity to be a significant factor only in the parking duration and weekend model**, although it is highly dependent on the time and location.

The external factor number of households is found to be a significant factor affecting parking demand in both the weekday and weekend models, along with the number of companies and employment being significant in the weekend model, but all external factors lack significance in the parking duration model. The exception is the monthly external factor dummies, which show differing levels of significance for different months in each model.

Price elasticity, time and location

The paper concludes to find that price elasticity is an important factor to consider, but is highly volatile depending on time and location. Furthermore, the number of households has a significant effect on parking demand, although it differs between the weekdays and weekends. Trends of external factors however can be used in order to find suitable location for parking garages. Furthermore, price elasticity can be used in order to maximise certain company specific goals, such as high profits or high occupancy rates. These do however require more flexible parking policies.

"Price elasticity is an important factor to consider, but is highly volatile depending on time and location."