

PRICE ELASTICITY OF RIDESHARE: COMMUTER FRINGE BENEFITS FOR VANPOOLS

PROBLEM STATEMENT

Section 132(f) of the Internal Revenue Code allows most employers to provide a tax-free benefit to employees of up to \$100 per month for transit and vanpool fares. It has been hypothesized that transit and vanpool co-pay programs by employers could have a dramatic impact on ridership. Given that the maximum amount an employee can apply towards the current tax benefit program is \$100 per month for transit and vanpooling, it could be argued that employees who receive such a benefit from their employers could be receiving services at a very low cost or even for free, and, therefore, potential ridership should be significantly higher. Research on price elasticity of vanpool fares or subsidies is essential to determine the potential impact of such programs.

OBJECTIVES

The goal of this research project was to determine the fare elasticity of rideshare, especially in cases where there could be large changes in fares or subsidies (at least by 50%). Because of the multiple modes for providing rideshare and the limited resources to cover all of them, this research focused on the study of vanpools. Also, due to data limitations, the more rigorous quantitative analysis was limited to the Puget Sound experience; at the same time, researchers performed quantitative analysis using simple elasticities and tabular representations for other areas (including Florida organizations).

FINDINGS AND CONCLUSIONS

The estimated parameter associated with the vanpool operating cost variable had a value of -0.0263, which translated into an odds ratio value of -2.6%. Therefore, a dollar decrease in fare, due to subsidies or fare reductions, would be associated with a 2.6% increase in vanpool ridership. The estimated parameter associated with participant discounts was 0.0855 or the odds ratio of 1.089, which implies that the predicted odds of choosing vanpool transportation over driving alone increase by 8.9% when an employee is offered a subsidy to use a vanpool. The model predicts that employees working in the administrative and technical fields are more likely to choose a vanpool option over the drive-alone use of an automobile. In particular, if an employee works in the administrative field, the odds of choosing a vanpool increase by about 50% with respect to personal automobile travel, while they increase by 23% if the employee works in the technical services field. The predicted value of elasticity for this sample dataset was equal to -0.61, which indicates that the vanpool choice is relatively inelastic to price changes.

Researchers also analyzed a more recent dataset to investigate the reliability of the model and congruency of parameter estimates. A second dataset was built for the year 1999. The estimated parameter associated with the vanpool cost variable was -0.1603, which translated into a value of -14.8%, i.e., a one dollar increase in vanpool price is associated with a 14.8% decrease in the predicted odds of choosing vanpool over drive-alone. The estimated parameter was 1.02, with an odds ratio of

2.79, which implies that the predicted odds of choosing vanpool over drive-alone increase by 1.79 when the employee is offered a subsidy to use a vanpool. The results using the 1999 dataset were not robust, since most of the estimated parameters associated with the dummy variables were not statistically significant. The predicted value of elasticity for the 1999 sample dataset was equal to -1.34. Researchers also used a nested logit model in the analysis. The nested logit model allows the user to consider the existence of different competitive relationships between groups of alternatives in a common nest. This approach represents a theoretical improvement upon the simple multinomial (conditional) logit model. The assumption was that both drive-alone and carpool are closed means of transportation, due to their mode-specific characteristics.

Two types of limitations were experienced. The first type related to model specification. The second type was general to the overall study. Results from the logit model have to be considered in the light of the dataset used to estimate the model. The model was constructed using only data from the Puget Sound and, therefore, specifically applies only to this region. Care should be exercised when considering the practical applicability of such results in a policy setting context outside the Puget Sound. Similarly, results from the nested logit model are dependent on the dataset used and the hypothesized nest. Other hypothetical nests could be conceived, each potentially leading to different elasticity estimates. Care should, therefore, be exercised when considering the practical applicability of such results in a policy setting context.

Because of limited data, a quantitative analysis of Florida organizations and a few others around the country was not possible. Instead, a qualitative analysis using simple elasticities and tabular representations was performed. While these methods revealed varied elasticities, they were of the correct relation (negative relation between fares and ridership). However, because of the limited amount of data for each responding organization (both longitudinal and/or cross-sectional), no significant conclusions can be drawn from these specific findings.

This project calls for a more comprehensive study employing a wider scope of data from several organizations across the country. Some of the key areas to pay more attention to in future research involve participation of multiple organizations, availability of data, and interpretation of the model.

BENEFITS

Because of the limited scope of data (from a regional perspective) and a short history of the study of elasticity in the vanpool industry (from a longitudinal perspective), this study does not provide a conclusive explanation about fare elasticity in the vanpool industry. Unlike the transit industry, the limited scope of data in this study makes it difficult to provide a more generalized application of findings. However, the study provides a framework from which subsequent studies can employ diverse research and refine the methodologies towards more reliable results. Enhanced understanding of vanpool price elasticity could contribute to the expansion of vanpooling in Florida. With the removal of five to 14 vehicles from the road for every vanpool, Florida would benefit by reduced traffic congestion, improved air quality, increased mobility, and decreased reliance on fossil fuels.

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