

Effects of Transit Fare Discount Programs on Passenger Volumes and Transferring Behaviors

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Abstract : To address traffic congestion problems and encourage the use of public transportation systems in the Taipei metropolitan area, the Taipei City Government and the New Taipei City Government implemented a monthly ticket policy on April 16, 2018. This policy offers unlimited rides on the Taipei MRT, Taipei City Bus, New Taipei City Bus, Danhai Light Rail, and Public Bike (YouBike) on a monthly basis. Additionally, both city governments replaced the smart card discount policy with a new frequent flyer discount program (referred to as the loyal customer program) on February 1, 2020, introducing a differential pricing policy. Specifically, the more frequently the Taipei MRT system is used, the greater the discounts users receive. To analyze the impact of the Taipei public transport monthly ticket policy and the frequent user discount program on the passenger volume of the Taipei MRT system and the transferring behaviors of MRT users, this study conducts a trip-chain analysis using transaction data from Taipei MRT smart cards between September 2017 and December 2020. To achieve these objectives, the study employs four indicators: 1) number of passengers, 2) average number of rides, 3) average trip distance, and 4) instances of multiple consecutive rides. The study applies the t-test and Mann-Kendall trend test to investigate whether the proposed indicators have changed over time due to the implementation of the discount policy. Furthermore, the study examines the travel behaviors of passengers who use monthly tickets. The empirical results of the study indicate that the implementation of the Taipei public transport monthly ticket policy has led to an increase in the average number of passengers and a reduction in the average trip distance. Moreover, there has been a significant increase in instances of multiple consecutive rides, attributable to the unlimited rides offered by the monthly tickets. The impact of the frequent user discount program on changes in MRT passengers is not as pronounced as that of the Taipei public transportation monthly ticket policy. This is partly due to the fact that the frequent user discount program is only applicable to the Taipei MRT system, and the passenger volume was greatly affected by the COVID-19 pandemic. The findings of this research can serve as a reference for Taipei MRT Corporation in formulating its fare strategy and can also provide guidance for the Taipei and New Taipei City Governments in evaluating differential pricing policies for public transportation systems.

Keywords : frequent user discount program, mass rapid transit, monthly ticket, smart card

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