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Policy and practice evaluation of transport policy based on large-scale empirical data

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Editorial

Special issue in transportation research part A: Policy and practice evaluation of transport policy based on large-scale empirical data

The economic development of cities is closely connected to their transport infrastructure and systems. Implementing effective transport policies is important to enhance the efficiency of the exiting transportation system. An important question is the degree to which these policy effects align with the initial objectives of these policies over time. Monitoring and understanding the longitudinal effects of transport policies is critical for effective decision-making.

Automated data collection systems in traffic, public transport, and new mobility services (e.g., Uber/DiDi) provide a wealth of disaggregated empirical data on the state of the system, the movement of passengers within the system, and service usage. These data provide opportunities to measure, assess, and monitor the effects of transport policies over time. Leveraging on these data, this special issue presents recent research on evidence-based evaluation of transport policies using empirical data. This special issue features 8 selected articles which address novel aspects of transport policy evaluation, as well as methodological advancements using empirical data. These 8 articles in this special issue come from five countries, including Japan, the U.S., China, France, and Switzerland, and cover policies in the fields of price elasticity of parking demand, speed limit reduction, pandemic lockdown, transit fare, intercity ridesharing, and congestion pricing, as described below.

Price elasticity is the key factor in determining the impact of parking fees on travel demand. In order to estimate the price elasticity of parking demand in the Japanese coin-parking market, Seya et al. (2024) conducted a field survey of parking prices and demand, and constructed a Heckman-type sample-selection model with instrumental variables estimation as the empirical model. The results show that price elasticity ranged from –1.683 to –0.9971, which reflects a much higher sensitivity than previously reported. This difference is attributed to the characteristics of the target area where alternative parking spaces and transportation options are readily available.

New York City has introduced a citywide speed limit reduction on November 7th, 2014. To assess the safety effectiveness of this policy, Zhai et al. (2022) proposed a novel causal inference approach that can jointly account for spatial spillovers, tackle confounding bias, and capture the time trend. The results indicate that the speed limit reduction would result in a 62 % decrease in fatal crashes, with the spatial spillover effect found to be statistically significant.

To control the spread of the COVID-19 virus, governments implemented unprecedented national lockdown policies since early 2020. While effective in slowing down the spread of the virus, these containment measures have negatively affected economies around the world and, particularly, the global supply chain. In this context, Bai et al.(2022) quantified both the immediate and longer-term impact of COVID-19 national lockdown policies on port calls in major international container ports using the Difference-in-Difference (DID) and combined regression discontinuity design (RDD)-DID models. The results show that lockdown policies with different levels of stringency can lead to different types of trade shocks and, consequently, different patterns of the number of port call changes. Also in the context of the pandemic, Zha et al. (2023) used a social media-based analytical methodology to support urban transportation policymaking. They found that the developed policymaking support methodology can be an effective tool to evaluate the acceptance of anti-pandemic policies from the public's perspective, assess the balance between policies and people's demands, and also perform the response analysis of a series of policy adjustments using online feedback.

Fare policy plays an important role in transit operations and management. To better coordinate and achieve the multidimensional goals of a proposed fare adjustment policy, a fundamental step is to evaluate its impacts on travel patterns. To quantify the impacts of the fare increase policy on travel patterns, Chen and Zhou (2022) performed individual- and group-level analyses using empirical data from Wuhan, China. The results show that the fare increase has significant but varying impacts on travel demand across users and user groups. The commuter group identified using a topic model was found to reduce their trip frequency more but later as compared to

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other groups following the fare increase. Moreover, users from the periphery, traveling longer distances and going to fewer destinations exercised lesser sensitivity to the fare increases.

During a nationwide railway strike, passengers look for alternatives for travel. Shared modes, such as ridesharing, offer a potential alternative mode of transport during a major disruption. To understand the dynamics between ridesharing and other modes during a transportation disruption, Yeung and Zhu (2022) investigate the capacity flexibility and the price fluctuations of BlaBlaCar during a nationwide French railway strike. The empirical analysis shows that, on an average strike day, the number of offered seats increased by approximately 6 %, while the number of booked seats rose by 33 %. Despite the spikes in travel demand, prices remained stable during the strike.

Chicago has introduced a congestion pricing policy targeting transportation network company (TNC) services to address congestion, promote sustainable forms of transportation, and support the public transit system. To quantify the impacts of this policy on TNC ridership in Chicago, Zheng et al. (2023) examined the effects of the policy shock on various types of TNC trips, as well as for different communities within the City of Chicago. Employing a Difference-in-Differences identification strategy, the study finds that the implementation of the congestion pricing policy led to an increase in shared TNC trip counts and a much larger decrease in single-occupant trip counts.

It is generally challenging to identify the causal effect of lower fares on public transport demand, as transport supply changes over time. To address this issue, Wallimann et al. (2023) apply the synthetic control method to assess the demand effects of lower public transport fares in Geneva, Switzerland. This study proposes an aggregate metric that inherits changes in public transport supply to assess these effects, and finds that the lower fares caused an increase of 10.6 % from 2015 to 2019 in passenger demand.

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References

Bai, X., Ming, Xu., Han, T., Yang, D., 2022. Quantifying the impact of pandemic lockdown policies on global port calls. Transp. Res. Part A: Policy Pract. 164, 224–241.

Chen, R., Zhou, J., 2022. Fare adjustment's impacts on travel patterns and farebox revenue: an empirical study based on longitudinal smartcard data. Transp. Res. Part A: Policy Practice 164, 111–133.

Seya, H., Asaoka, T., Chikaraishi, M., Axhausen, K.W., 2024. Estimating the price elasticity of demand for off-street parking in Hiroshima City, Japan. Transp. Res. Part A: Policy Pract. 183, 104051.

Wallimann, H., Blättler, K., von Arx, W., 2023. Do price reductions attract customers in urban public transport? A synthetic control approach. Transp. Res. Part A: Policy Pract. 173, 103700.

Yeung, T.-C., Zhu, D., 2022. Intercity ridesharing to the rescue: capacity flexibility and price stability of BlaBlaCar during the 2018 French railway strike. Transp. Res. Part A: Policy Pract. 164, 270–290.

Zha, W., Ye, Q., Li, J., Ozbay, K., 2023. A social media Data-Driven analysis for transport policy response to the COVID-19 pandemic outbreak in Wuhan, China. Transp. Res. Part A: Policy Pract. 172, 103669.

Zhai, G., Xie, K., Yang, D.i., Yang, H., 2022. Assessing the safety effectiveness of citywide speed limit reduction: a causal inference approach integrating propensity score matching and spatial difference-in-differences. Transp. Res. Part A: Policy Pract. 157, 94–106.

Zheng, Y., Meredith-Karam, P., Stewart, A., Kong, H., Zhao, J., 2023. Impacts of congestion pricing on ride-hailing ridership: evidence from Chicago. Transp. Res. Part A: Policy Pract. 170, 103639.

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