

Ride Sharing, Spatial Frictions, and Urban Consumption Patterns

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Mobile technology-based point-to-point transportation (e.g., peer-to-peer ride sharing or e-hailing) services have become increasingly popular globally. In the United States, Uber and Lyft are the two most popular platforms providing these mobility services, and Didi and Grab are other examples of globally popular transportation platforms. These services have had a rapid rise in popularity in the past decade: it is estimated that in the US, Uber and Lyft accounted for around 30 million vehicle miles traveled (VMT) per month in December 2013, but over 500 million VMT per month around December 2016.

Given the popularity of these services, there has been increasing interest in more active management and urban policy around these services. First, these services (and other new urban mobility services such as e-scooters) are increasingly integrating with urban management and policy efforts. There are several examples of cities testing pilot local subsidy programs with Uber and Lyft; for example, Pinellas, Florida subsidized Uber for low-income night-shift workers because public transit isn't accessible at night. To consider these subsidies, relevant questions include whether there is a spillover effect on the urban economy and behavior from the reduced frictions of these mobility services. And if so, do these spillovers differ meaningfully along demographic characteristics? The analyses of this paper provide such empirical evidence of the potential overall urban influences of these new technologies, and also heterogeneity in their influence, which could suggest evidence of efficient ways to subsidize mobility services.

Motivated by these urban management challenges, Zhang and Li ask two research questions using the rapid rise of ride sharing as a case study of a reduction in spatial frictions. First, did the reduction in local spatial frictions enabled by Uber and Lyft increase the local consumption frequency of the users of these services? This is not obvious, since the null hypothesis is that these consumers simply used Uber and Lyft to replace their existing modes of transport. Second, did the reduction in local spatial frictions increase the spatial diversity of consumption for these ride sharing users? The null hypothesis here is that even if consumers with lowered frictions now increase their consumption frequency, they may simply consume in the same neighborhoods where they previously did.

To study these research questions, this paper uses a novel, fine-grained dataset of anonymized individual credit card transactions from 2012 to 2016, from an anonymized sample of credit card accounts. Over 10,000 of these anonymous accounts were observed to have used Uber or Lyft services at least once. In the US, UberX and Lyft peer-to-peer services started in 2012, but did not have national expansion entering various cities until late 2013 and 2014, so the data observe consumption activity both before and after Uber and Lyft were available to consumers.

In summary, the main findings are the following. Across their various analyses, the researchers find that, consistent with their model of revealed preferences and reduced spatial frictions, there appears to be no increase in consumption activity associated with adoption itself,

but instead there are increases among consumers who incur actual usage of the ride-sharing services (i.e., those who reveal that ride sharing is useful to them). Post-adoption, relative to their pre-adoption consumption, those who utilize ride sharing increase both their average number of local transactions per month and their number of unique zip codes visited more than low-usage adopters and non-adopters do. They also find substantial heterogeneity in this relationship of usage and post-adoption changes along the dimensions of merchant category, account age, average amount spent per month, and geographic neighborhoods. They find that low-spending, high-usage consumers have a larger increase in consumption activity after ride sharing becomes available, while high-spending, high-usage consumers have a smaller-to-no increase in consumption activity. This suggests subsidizing some demographic groups may have larger effects on local economic activity. Overall, their paper contributes one of the first empirical analyses of local consumption behavior at the individual level in response to a spatial frictions shock. In this case, it is the availability of peer-to-peer ride sharing services. However, this analysis is relevant for other recent and future mobility shocks from e-scooters to autonomous vehicles.