Measuring the Impact of an Unanticipated Disruption of Uber/Lyft Services in Austin, TX

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Motivation

- On May 7, 2016, residents of Austin, Texas, voted against Proposition 1, a development that prompted Uber and Lyft to suspend services.
- The disruption provided for a natural experiment to measure the impact of transportation network companies (TNCs) on travel behavior examined along two dimensions:
    - Travel mode shift (energy efficiency)
    - Changes in trip frequency – (energy consumption/environmental knock on effects)

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- On May 7, 2016, residents of Austin, Texas, voted against Proposition 1, a development that prompted Uber and Lyft to suspend services.
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  - **Travel mode shift (energy efficiency)**
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Study approach

- Premise: severity of the disruption is explained primarily by the **difference in TNC quality** pre & post disruption
- Analysis blends platform data with survey responses (both stated and revealed preference questions)
- Empirical strategy: Descriptive statistics & Regression analyses

Summary statistics

Mean of Pre and Post Disruption Measures				
Variable	*Obs. (Pre).*	*Obs. (Post).*	*Mean (Pre)*	*Mean (Post)*
Trip Monthly Freq	1121	1312	5.6	2.1
Binary Responses				
Question				*Yes*
Is reference trip now taken by public transit?				17 (2.9%)
Do you have access to an automobile?				1274 (94%)
Scaled Responses (Likert 1-5)				
Statement				Extremely Positive (5)
Pre-disruption TNC trip satisfaction				927 (82%)
Post-disruption TNC trip satisfaction				242 (38%)

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Travel mode shift – estimated probabilities

	Personal Vehicle	Existing TNCs	All Others
Post-disruption (actual) probabilities	0.451	0.419	0.130
Post-disruption (predicted) probabilities	0.466	0.385	0.149
Regressors' marginal effects[a]			
Satisfied	0.328***	-0.289***	-0.038
Vehicle access	0.258**	-0.043	-0.215***
Core	-0.194***	0.147***	0.047

[a]*Marginal change represents a change of 0 to 1 for each variable*

***Significant at the .05 level; *** at the .01 level*

Changes in trip frequency

- Disruption, on average, decreased trip frequency.
- Individuals who were most satisfied with Uber/Lyft had biggest decrease in trip frequency
- Individuals who switched to personal vehicles increased their trip frequency
- Cumulative effect of the trip frequency decrease muted by these counteracting influences

Energy & Environment Implications

- Findings are context specific
- Benefits of TNCs depend on how they are coupled with the prevailing public transit architecture
- Innovation within the TNC industry should be taken into consideration

SSRN version of the paper: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2977969

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