UNBANKED POPULATION AND NYC TAXICAB TRIPS

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Abstract

Taxicabs are a critical aspect of the public transit system in New York City. The yellow cabs that are ubiquitous in Manhattan are as iconic as the city's subway system, and in recent years green taxicabs were introduced by the city to improve taxi service in areas outside of the central business districts and airports. Approximately 500,000 taxi trips are taken daily, carrying about 800,000 passengers, and not including other livery firms such as Uber, Lyft or Carmel. Since 2008 yellow taxis have been able to process fare payments with credit cards, and credits cards are a growing share of total fare payments. However, the use of credit cards to pay for taxi fares varies widely across neighborhoods, and there are strong correlations between cash payments for taxi fares, cash payments for transit fares and the presence of unbanked or underbanked populations. These issues are of concern for policymakers as approximately ten percent of households in the city are unbanked, and in some neighborhoods the share of unbanked households is over 50 percent. In this paper we use multiple datasets to explore taxicab fare payments by neighborhood and examine how access to taxicab services is associated with use of conventional banking services. There is a clear spatial dimension to the propensity of riders to pay cash, and we find that both immigrant status and being 'unbanked' are strong predictors of cash transactions for taxicabs. These results have implications for local regulations of the for-hire vehicle industry, particularly in the context of the rapid growth of services that require credit cards. Without some type of cash-based payment option taxi services will isolate certain neighborhoods. At the very least, existing and new providers of transit services must consider access to mainstream financial products as part of their equity

Does Access to Bank Accounts Affect Access to Taxicabs?

• Taxicabs provide critical mobility and access to people without a car by choice or circumstance

- The lowest income quintile relies on taxicabs more than middle income travelers
- In New York City, over 40% of all taxi trips are paid with cash
- One in ten households are unbanked
- Without a bank account households cannot have a conventional credit card

Why Are People Unbanked?

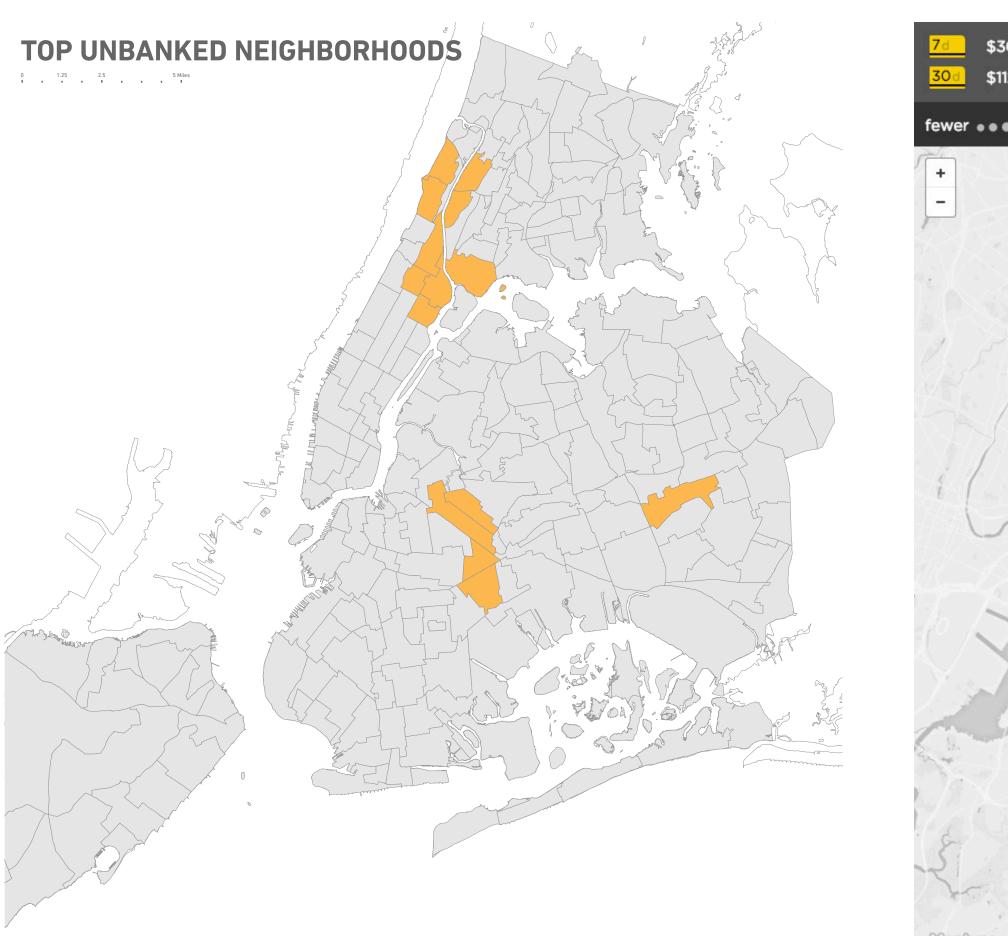
- Irregular employment
- Check cashing or cash wages are cheaper than conventional bank accounts
- Immigrant status

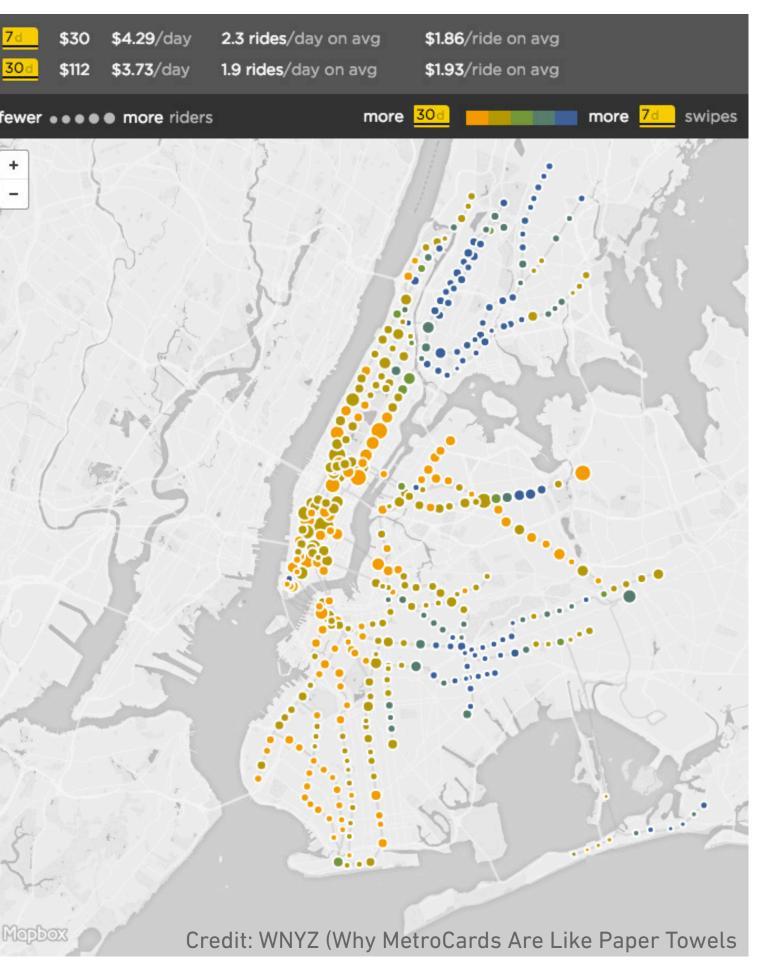
Research Questions

- Is unbanked status associated with cash payments for taxicabs?
- Do neighborhood characteristics help explain fare payments?

Unbanked in New York City

- Over 10 percent of households in New York City do not have access to a bank account
- This is higher than the national average
- Substantial disparities of bank access across the city
- Approximately one-half of all unbanked households are in just ten neighborhoods
- Bank status associated with income and immigrant status
- Banking status is influenced both by choice and circumstance





Neighborhoods with high shares of unbanked also see high use of cash fares for public transit

Largest Share of Unbanked Households

Mott Haven/ Melrose	Bronx	56%
Morris Heights/University Heights	Bronx	53%
Highbridge/Concourse	Bronx	51%
Ocean Hill/Brownsville	Brooklyn	47%
Bushwick	Brooklyn	47%
Washington Heights/Inwood	Manhattan	46%
West Harlem	Manhattan	38%
East Harlem	Manhattan	37%
Central Harlem	Manhattan	36%
Jamaica	Queens	24%

Taxi Markets in New York City

- New York is served by yellow and green taxicabs
- Yellow taxis are street hail only and serve the entire city
- Green taxis are street hail or pre-arranged and serve Northern Manhattan and outer boroughs areas traditionally underserved by yellow taxicabs
- Green taxicabs have higher share of cash trips than yellow taxicabs
- In addition to formal taxi services, community cars, jitneys and other informal services are common in low-income and immigrant communities, and these are all cash fares

Characteristics for All Trips - October 2014

Green Cab Trips

Cash Trips

Yellow Cab Trips

1,266	Total Trips -	 14,232,48
0,747	Cash Trips -	 5,684,24

	Cash 40%	Credit 60%
)	Total Trips	14,232,488
	C T :	F / O / O / O

Data and Methods

- We examine these questions using multiple data sets.
 - New York City Yellow and Green taxicab data
 - New York City Department of Consumer Affairs Community Banking Profiles
- Taxi data from October 2014
- Trip data aggregated to neighborhood level by origin and destination
 - Smallest geography with banking data
 - 52 neighborhoods with complete data, covers entire city

Analysis

- Neighborhood characteristics help explain propensity to pay cash for taxi trips
- Green taxis, which serve more unbanked areas of the city than yellow taxis, have higher shares of

Regression Analysis

- Neighborhood level regressions were used (n=52)
- Dependent variable was percent of cash trips
- Independent variables used in final models are percent of households in poverty, percent of people born outside of US, and the percent of unbanked households. All date from 2013.
- Regressions were run for taxi trip origins and destinations by neighborhood separately
- Ordinary least squares (OLS) and generalized linear models (GLM) are shown
- Post-estimation diagnostics were used to create parsimonious models and avoid multicollinearity
- Strongest positive predictors of cash payments are percent foreign born and percent of unbanked
- Percent of households in poverty was not statistically significant though negatively correlated with cash fares

Regression Results

Trips by Origin of Ne	ighborhood	Trips by Destination of Neighborhood				
	OLS	GLM	OLS	GLM		
Poor 2013	-0.431 (.339)	-1.814 (1.644)	-0.548 (.261)	-2.258 (1.220)		
Foreing born 2013	0.668 (.133)	2.808 (.461)	0.587 (.102)	2.415 (.359)		
Unbanked 2013	1.087 (.439)	4.56 (2.139)	1.390 (.337)	5.727 (1.602)		
Constant	0.273 (.061)	-0.955 (.209)	0.241 (.047)	-1.065 (.144)		
F	10.31		17.52			
r^2	0.39		0.52			
n	52	52	52	52		

Conclusions

- Cash payments are common for taxi trips
- Outer borough taxi trips often cash based
- Immigrant status and access to bank accounts strongly predict cash fares
- Expansion of taxi services must account for people who use cash by choice or circumstance
- Credit card based taxi service exclude many potential taxi riders

Fare Characteristics of Green and Yellow Taxicabs in Unbanked Neighborhoods Trin Share by Green Yellow Cab Origins

Green Cabs Origins				Trip Share by Green		rettow cab origins				
TotalTrips	% of NY Total	CashTrips	%	% of NY Total	Origin	TotalTrips	% of NY Total	CashTrips	%	% of NY Total
16,733	1%	6,426	38%	1%	57%	12,468	0.09%	739	5.93%	0.01%
124,892	8%	71,826	58%	9%	69%	55,137	0.39%	3,767	6.83%	0.07%
142,355	10%	79,839	56%	10%	56%	112,892	0.79%	8,109	7.18%	0.14%
20,556	1%	15,335	75%	2%	91%	2,012	0.01%	159	7.90%	0.00%
3,925	1%	8,503	61%	1%	86%	2,175	0.02%	181	8.32%	0.00%
6,724	0%	5,268	78%	1%	93%	479	0.00%	34	7.10%	0.00%
2,214	0%	1,279	58%	0%	82%	472	0.00%	38	8.05%	0.00%
3,315	0%	2,302	69%	0%	94%	213	0.00%	16	7.51%	0.00%
59,973	4%	34,503	58%	4%	80%	15,368	0.11%	1,003	6.53%	0.02%
14,048	1%	8,023	57%	1%	53%	12,288	0.09%	831	6.76%	0.01%
27%	28%									
	16,733 124,892 142,355 20,556 3,925 6,724 2,214 3,315 59,973 14,048	TotalTrips % of NY Total 16,733 1% 124,892 8% 142,355 10% 20,556 1% 3,925 1% 6,724 0% 2,214 0% 3,315 0% 59,973 4% 14,048 1%	TotalTrips % of NY Total CashTrips 16,733 1% 6,426 124,892 8% 71,826 142,355 10% 79,839 20,556 1% 15,335 3,925 1% 8,503 6,724 0% 5,268 2,214 0% 1,279 3,315 0% 2,302 59,973 4% 34,503 14,048 1% 8,023	TotalTrips % of NY Total CashTrips % 16,733 1% 6,426 38% 124,892 8% 71,826 58% 142,355 10% 79,839 56% 20,556 1% 15,335 75% 3,925 1% 8,503 61% 6,724 0% 5,268 78% 2,214 0% 1,279 58% 3,315 0% 2,302 69% 59,973 4% 34,503 58% 14,048 1% 8,023 57%	TotalTrips % of NY Total CashTrips % of NY Total 16,733 1% 6,426 38% 1% 124,892 8% 71,826 58% 9% 142,355 10% 79,839 56% 10% 20,556 1% 15,335 75% 2% 3,925 1% 8,503 61% 1% 6,724 0% 5,268 78% 1% 2,214 0% 1,279 58% 0% 3,315 0% 2,302 69% 0% 59,973 4% 34,503 58% 4% 14,048 1% 8,023 57% 1%	TotalTrips % of NY Total CashTrips % of NY Total Origin 16,733 1% 6,426 38% 1% 57% 124,892 8% 71,826 58% 9% 69% 142,355 10% 79,839 56% 10% 56% 20,556 1% 15,335 75% 2% 91% 3,925 1% 8,503 61% 1% 86% 6,724 0% 5,268 78% 1% 93% 2,214 0% 1,279 58% 0% 82% 3,315 0% 2,302 69% 0% 94% 59,973 4% 34,503 58% 4% 80% 14,048 1% 8,023 57% 1% 53%	TotalTrips % of NY Total CashTrips % of NY Total Origin TotalTrips 16,733 1% 6,426 38% 1% 57% 12,468 124,892 8% 71,826 58% 9% 69% 55,137 142,355 10% 79,839 56% 10% 56% 112,892 20,556 1% 15,335 75% 2% 91% 2,012 3,925 1% 8,503 61% 1% 86% 2,175 6,724 0% 5,268 78% 1% 93% 479 2,214 0% 1,279 58% 0% 82% 472 3,315 0% 2,302 69% 0% 94% 213 59,973 4% 34,503 58% 4% 80% 15,368 14,048 1% 8,023 57% 1% 53% 12,288	TotalTrips % of NY Total CashTrips % of NY Total Origin TotalTrips % of NY Total 16,733 1% 6,426 38% 1% 57% 12,468 0.09% 124,892 8% 71,826 58% 9% 69% 55,137 0.39% 142,355 10% 79,839 56% 10% 56% 112,892 0.79% 20,556 1% 15,335 75% 2% 91% 2,012 0.01% 3,925 1% 8,503 61% 1% 86% 2,175 0.02% 6,724 0% 5,268 78% 1% 93% 479 0.00% 2,214 0% 1,279 58% 0% 82% 472 0.00% 3,315 0% 2,302 69% 0% 94% 213 0.00% 59,973 4% 34,503 58% 4% 80% 15,368 0.11% 14,048 1% 8,023	TotalTrips % of NY Total CashTrips % of NY Total Origin TotalTrips % of NY Total CashTrips 16,733 1% 6,426 38% 1% 57% 12,468 0.09% 739 124,892 8% 71,826 58% 9% 69% 55,137 0.39% 3,767 142,355 10% 79,839 56% 10% 56% 112,892 0.79% 8,109 20,556 1% 15,335 75% 2% 91% 2,012 0.01% 159 3,925 1% 8,503 61% 1% 86% 2,175 0.02% 181 6,724 0% 5,268 78% 1% 93% 479 0.00% 34 2,214 0% 1,279 58% 0% 82% 472 0.00% 38 3,315 0% 2,302 69% 0% 94% 213 0.00% 16 59,973 4% 34,503	TotalTrips % of NY Total CashTrips % of NY Total Origin TotalTrips % of NY Total CashTrips % 16,733 1% 6,426 38% 1% 57% 12,468 0.09% 739 5.93% 124,892 8% 71,826 58% 9% 69% 55,137 0.39% 3,767 6.83% 142,355 10% 79,839 56% 10% 56% 112,892 0.79% 8,109 7.18% 20,556 1% 15,335 75% 2% 91% 2,012 0.01% 159 7.90% 3,925 1% 8,503 61% 1% 86% 2,175 0.02% 181 8.32% 6,724 0% 5,268 78% 1% 93% 479 0.00% 34 7.10% 2,214 0% 1,279 58% 0% 82% 472 0.00% 38 8.05% 3,315 0% 2,302 69% <td< td=""></td<>

	Green Cabs Destinations						Yellow Cab Destinations				
Neighborhood	TotalTrips	% of NY Total	CashTrips	%	% of NY Total	Destination	TotalTrips	% of NY Total	CashTrips	%	% of NY Total
Bushwick_Dest	27,207	2%	11,654	43%	1%	37%	47,002	0.33%	2,986	6.35%	0.05%
Central_Harlem_Dest	80,412	5%	53,667	67%	7%	39%	124,526	0.87%	8,109	6.51%	0.14%
East_Harlem_Dest	67,479	5%	43,655	65%	5%	23%	229,102	1.61%	15,953	6.96%	0.28%
HighbridgeConcourse_Dest	23,037	2%	17,609	76%	2%	69%	10,127	0.07%	760	7.50%	0.01%
Jamaica_Dest	6,864	0%	4,798	70%	1%	61%	4,297	0.03%	327	7.61%	0.01%
Melrose_SouthMott_Haven_North_Dest	6,857	0%	5,318	78%	1%	69%	3,048	0.02%	248	8.14%	0.00%
Ocean_HillBrownsville_Dest	4,495	0%	2,800	62%	0%	54%	3,849	0.03%	271	7.04%	0.00%
University_HeightsMorris_Heights_Dest	5,552	0%	4,261	77%	1%	72%	2,109	0.01%	175	8.30%	0.00%
Washington_HeightsInwood_Dest	43,326	3%	28,806	66%	4%	35%	81,950	0.58%	5,355	6.53%	0.09%
West_Harlem_Dest	13,840	1%	8,748	63%	1%	40%	20,878	0.15%	1,396	6.69%	0.02%

