

Driving the Gig Economy

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Disclaimer

Any opinions and conclusions expressed are those of the research team members and do not necessarily represent the views of the U.S. Census Bureau.

All results reported have been reviewed to ensure that no confidential information is disclosed.

Much interest in the “gig economy”

Popular Questions

- Is new technology accelerating change in the organization of work?
 - Popular perception of dramatic growth in number of workers with no long-term connection to a particular business who are finding work through online spot marketplaces (“gig workers”)
 - Any significant changes in organization of work likely to have important implications for worker welfare (both positive and negative)
- How much has gig employment grown, who are the workers using new opportunities for gig work, and how do they use gig jobs?

Our Challenge

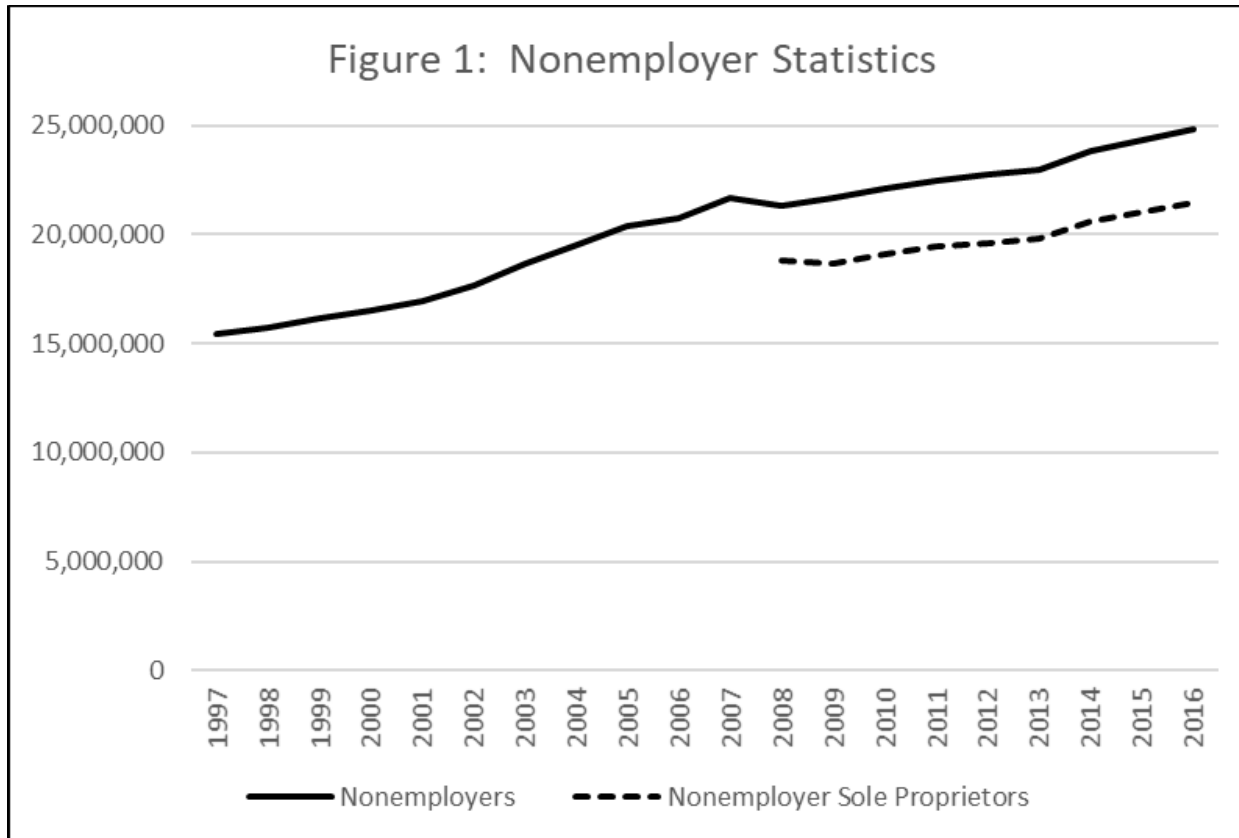
- Can administrative data (tax records) be used to explore these questions?

Using administrative records to identify gig
workers/jobs
and changing patterns over time

Source of Administrative Data on “gig” jobs

- Census Bureau data on Nonemployer businesses
 - Businesses that have no paid employment or payroll, are required to file a federal income return, and have gross business receipts of \$1,000 or more
 - Nonemployer statistics based on Schedule C’s filed with an individual’s tax return (unincorporated sole proprietors) and other forms containing similar information (partnerships, incorporated businesses)
 - Most nonemployers are unincorporated sole proprietors and that is the group we study

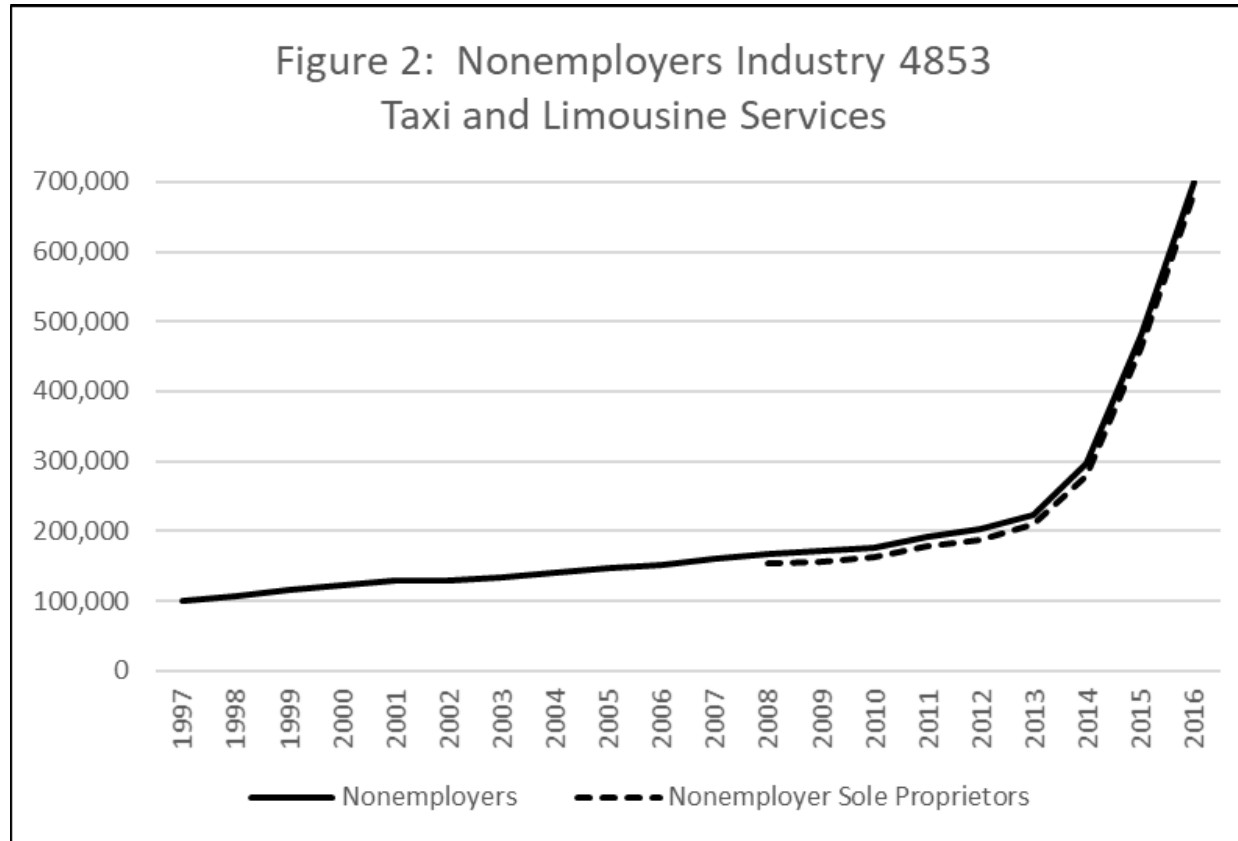
Growth in number of nonemployers overall



Nonemployers have grown at a 2.6% average annual rate, 1997-2015

For comparison: total nonfarm employment measured by payroll survey has grown at a 0.8% average annual rate, 1997-2015

Growth in number of nonemployers in NAICS 4853



NAICS 4853 is “Taxi and Limousine Services”

Published by Legal Form of Organization since 2008

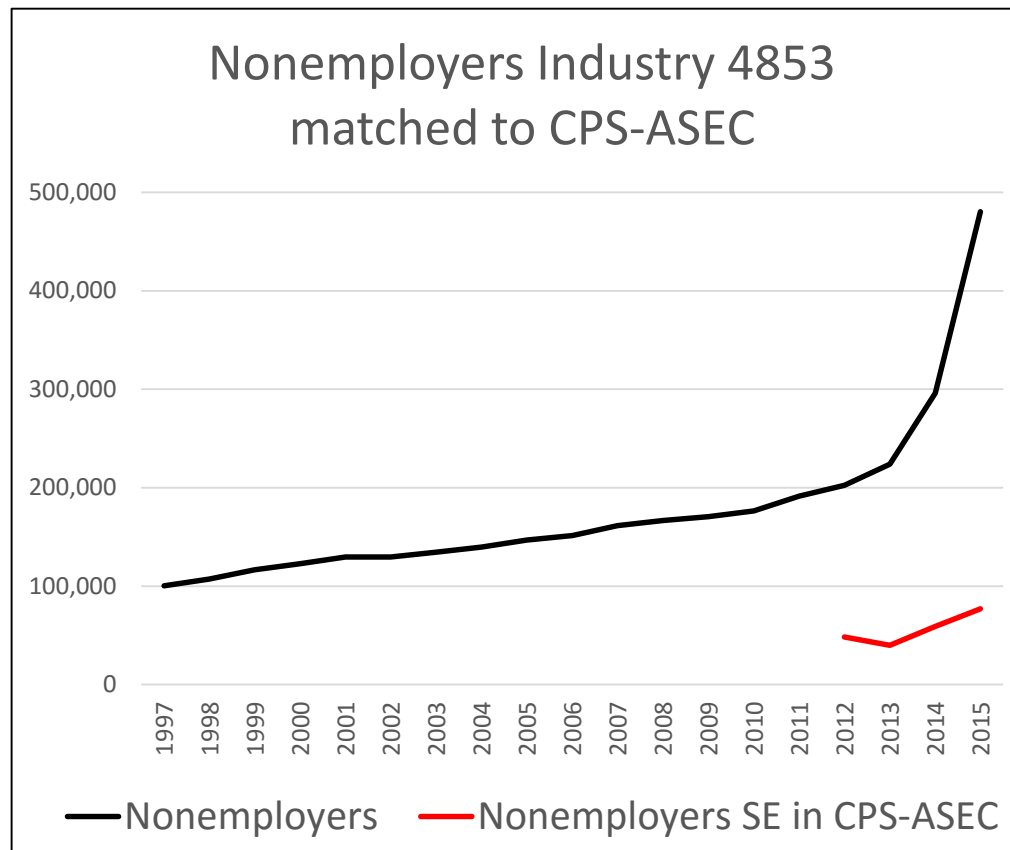
- Sole Proprietors
- Partnerships
- S-Corporations
- Corporations

Almost all of these nonemployers are sole proprietors

Growth in number of nonemployers in NAICS 4853: Do we see this pattern in CPS ASEC?

We have linked 2012-2015 nonemployers who appeared in the CPS-ASEC to their responses; estimates below are estimated counts using CPS-ASEC weights

	NAICS 4853 Non-employers	Nonemployers in NAICS 4853, SE in CPS-ASEC	Ratio
2012	194,000	48,500	25%
2013	219,000	40,000	18%
2014	320,000	59,000	18%
2015	489,000	77,000	16%



This paper: Case study of the ridesharing industry (NAICS 4853, Taxi and Limousine Services)

- Industry has grown very rapidly in recent years, driven by entrance of online platform companies into market
 - Opportunity to learn about how lowering of barriers to entry into self-employment affects decisions to participate and pattern of earnings
- Existing research has used bank and personal financial software records to study participation in online platforms (largest group in ridesharing) - usually non-representative samples
- This study uses administrative records - information on all reported earnings for (essentially) everyone

A Closer look at the ridesharing industry
(NAICS 4853, Taxi and Limousine Services)

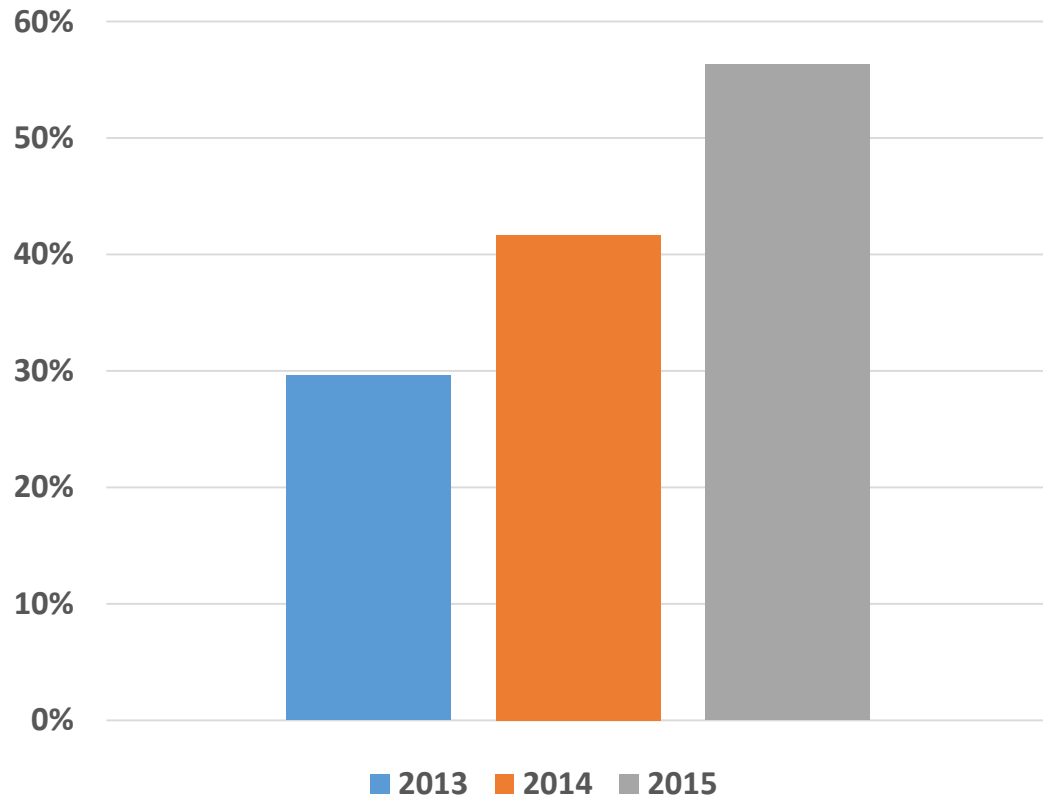
Step 1: Build Data Infrastructure

Data Infrastructure

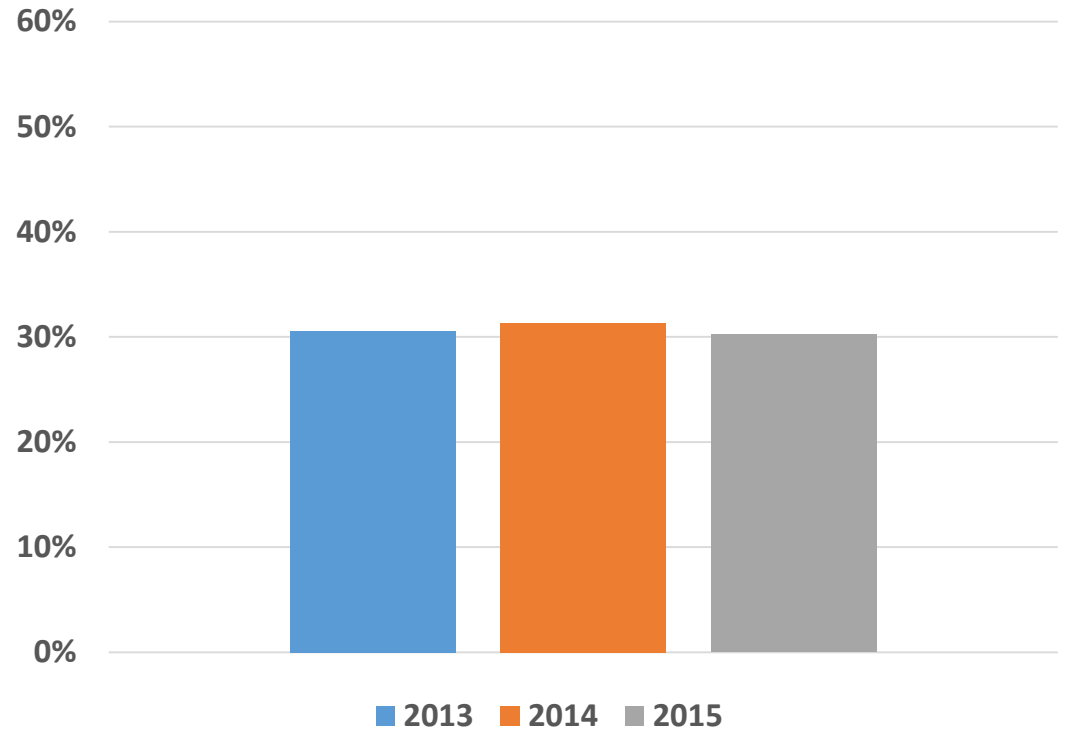
- Demographics:
 - Information on sex, year of birth, race and foreign born status derived from Social Security Administration Numident records
 - Directly reported information on education for ~15 percent of the population, imputed for ~80 percent and missing for ~5 percent
- Wage and Salary Earnings:
 - Longitudinal Employer-Household Dynamics (LEHD)
 - Information on quarterly wages paid to workers covered by unemployment insurance programs in all 50 states and DC
- Link by PIK to create person-year records for everyone with any nonemployer sole proprietor or wage income during year
- Current file contains data for 2010 and 2012-2015; next iteration will have data for 2010-2016

Pool of 4853 Entrants Changing Markedly Over Time

NAICS 4853



Other industries



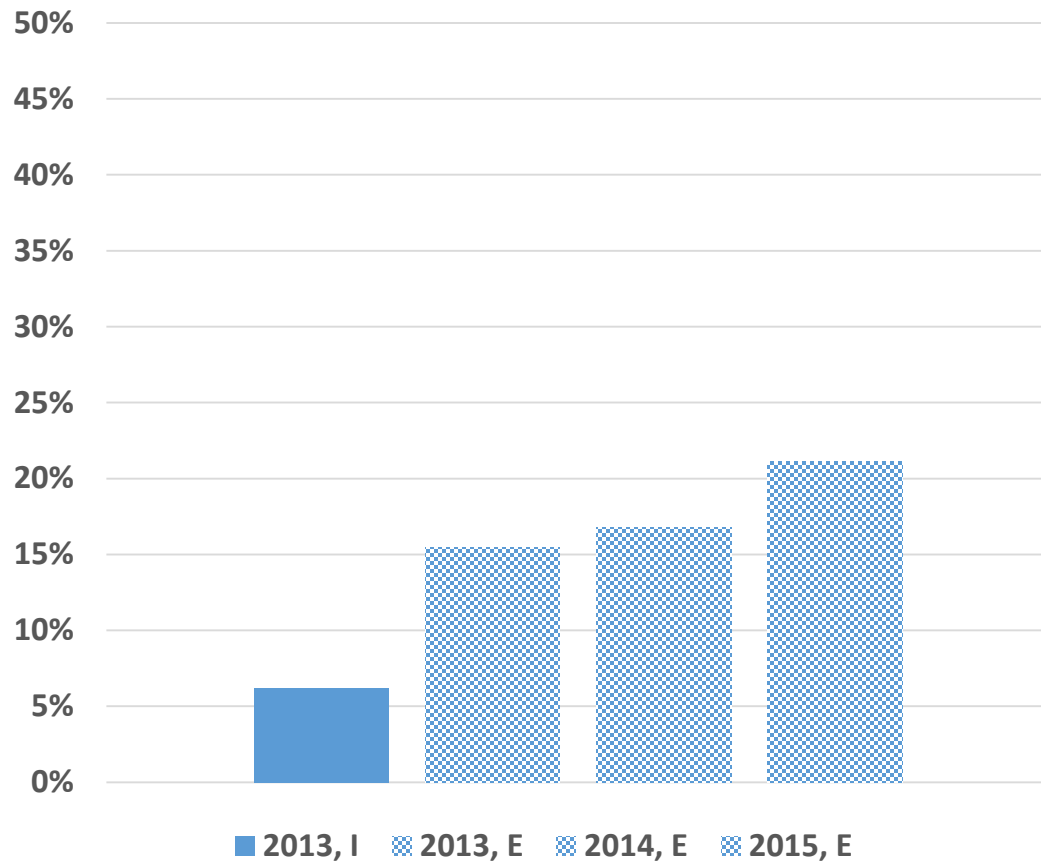
Entrants as share of total, nonemployers in 4853 and other industries, 2013-2015

Step 2:

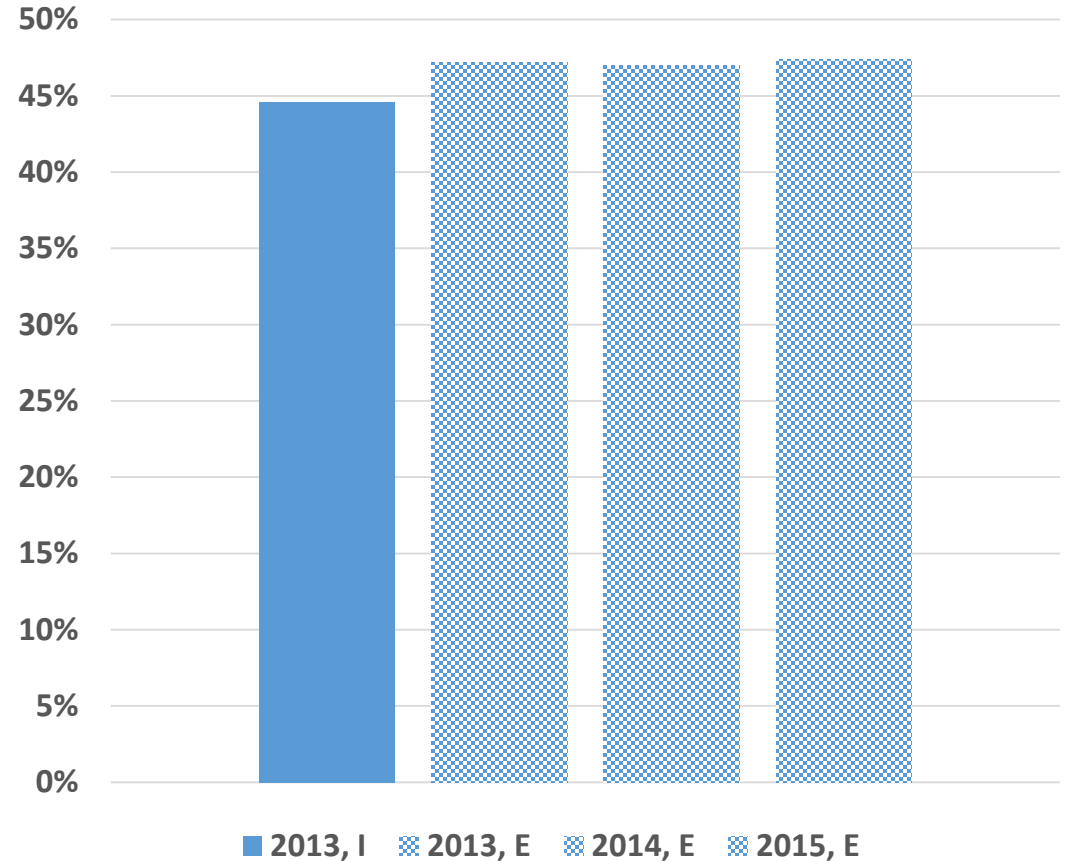
Characterize changes over time
in demographic and labor market traits
of 4853 nonemployers

Industry composed of higher share female over time

NAICS 4853



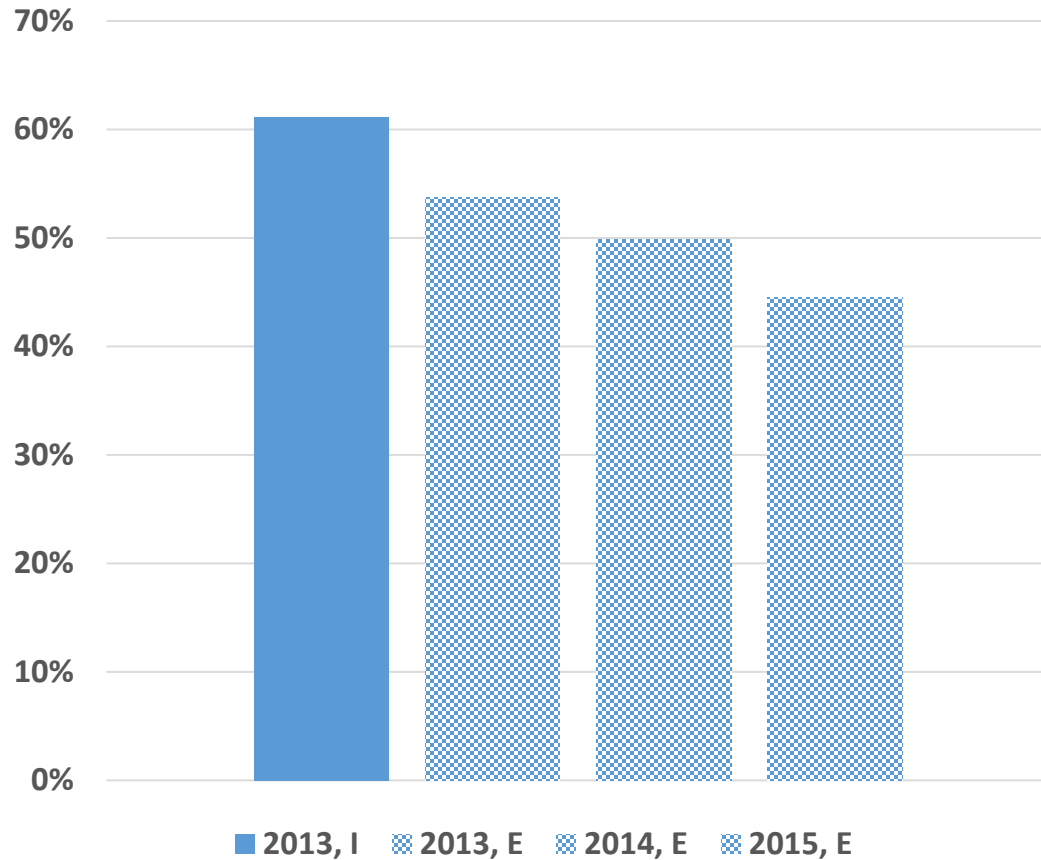
Other industries



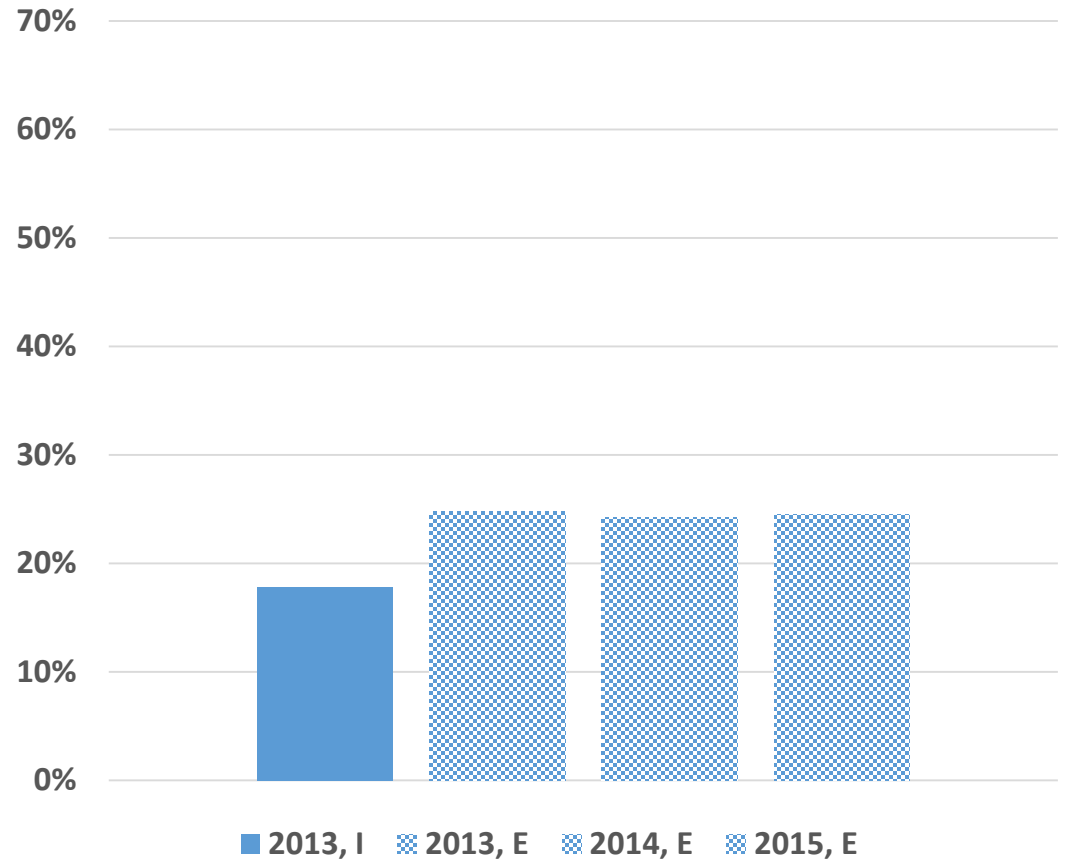
Percent female, nonemployers in NAICS 4853 and other industries, 2013 incumbents and 2013-2015 entrants

Industry becoming less nonwhite over time

NAICS 4853



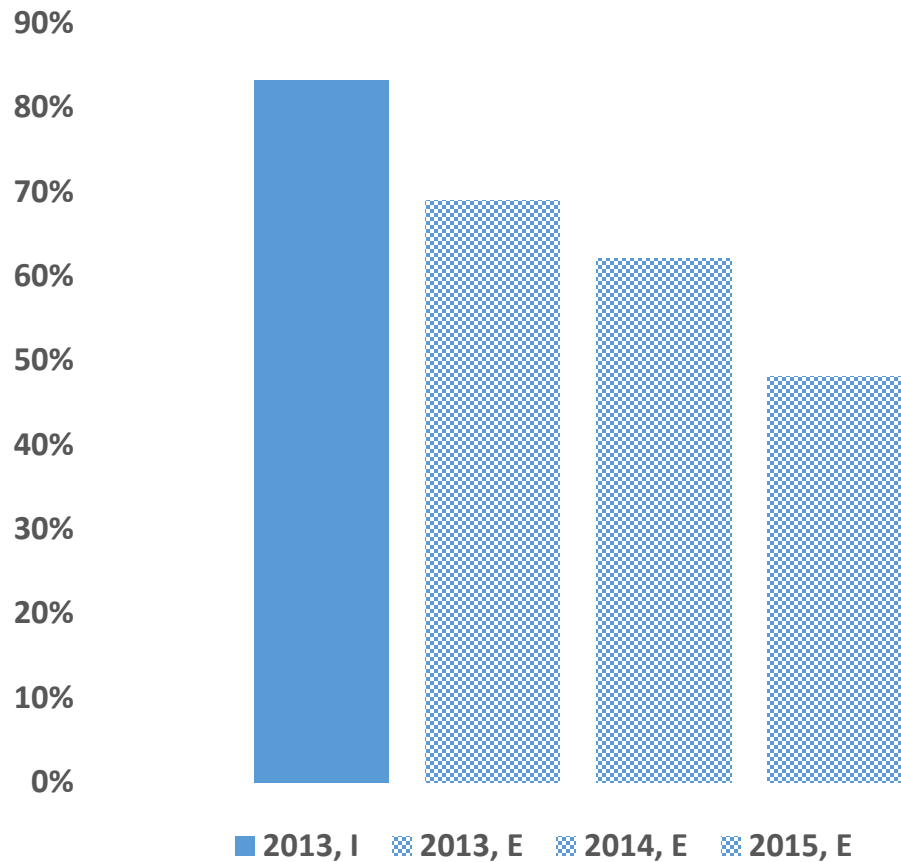
Other industries



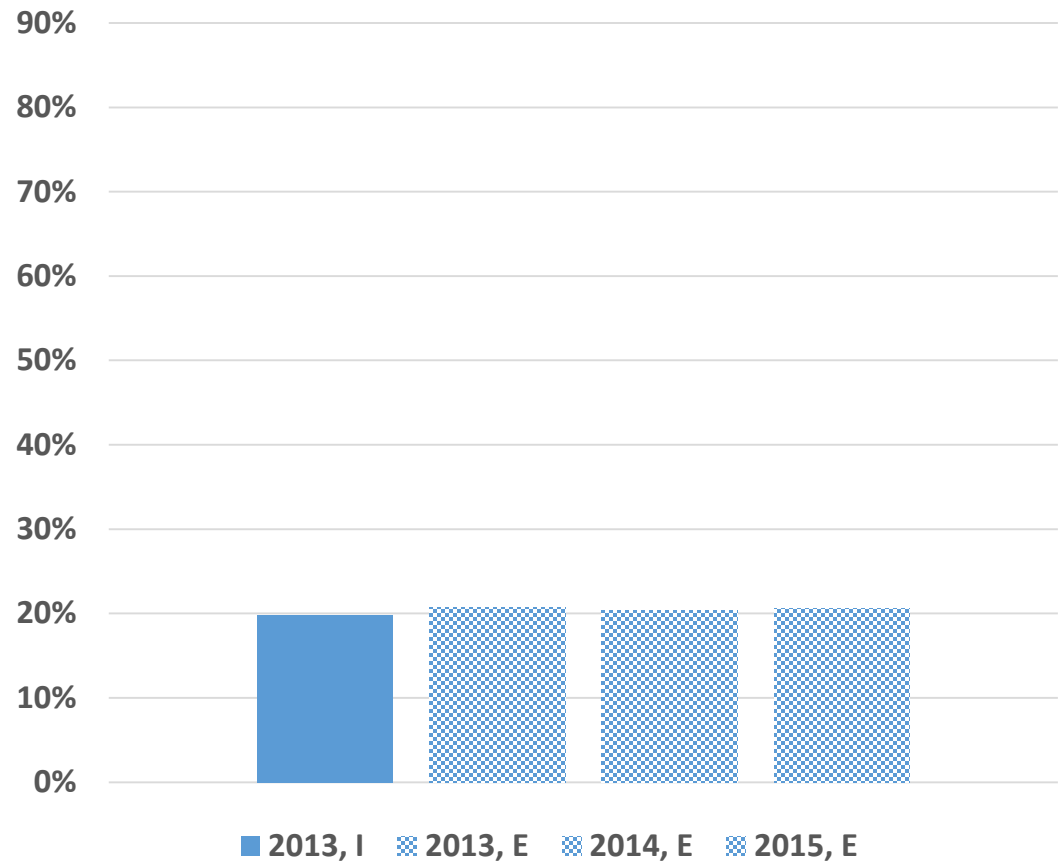
Percent nonwhite, nonemployers in NAICS 4853 and other industries, 2013 incumbents and 2013-2015 entrants

Industry becoming less foreign born over time

NAICS 4853



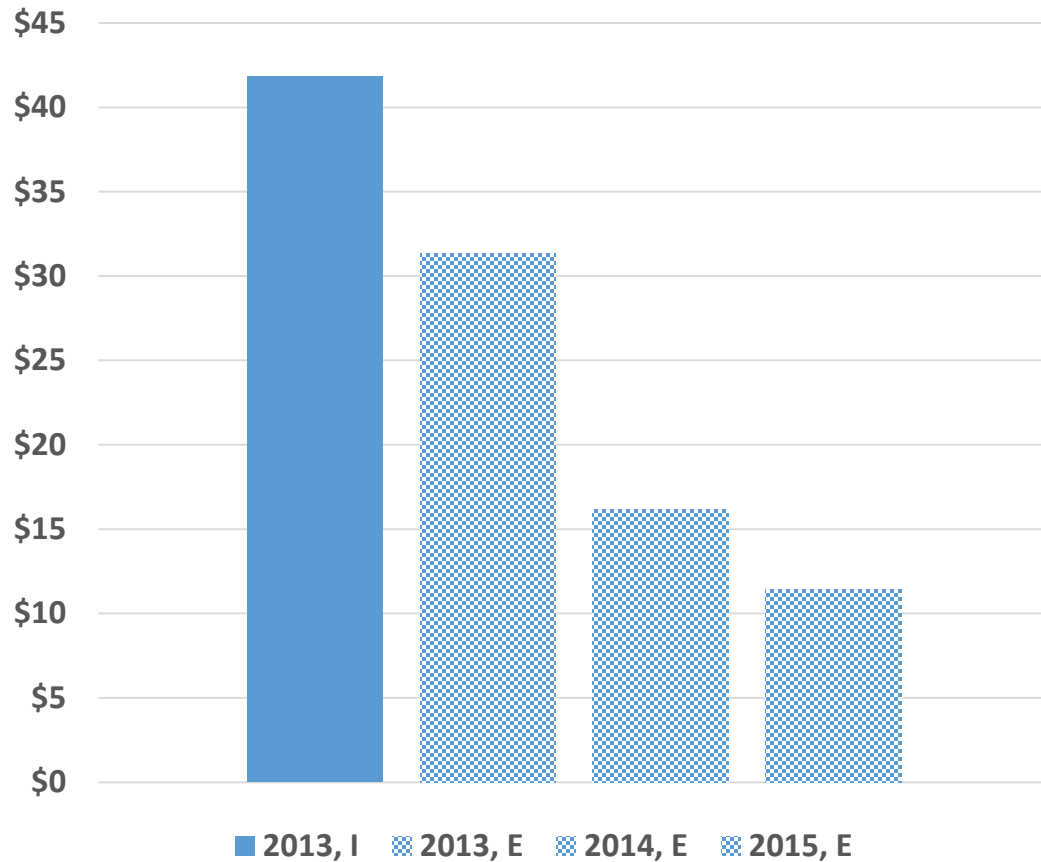
Other industries



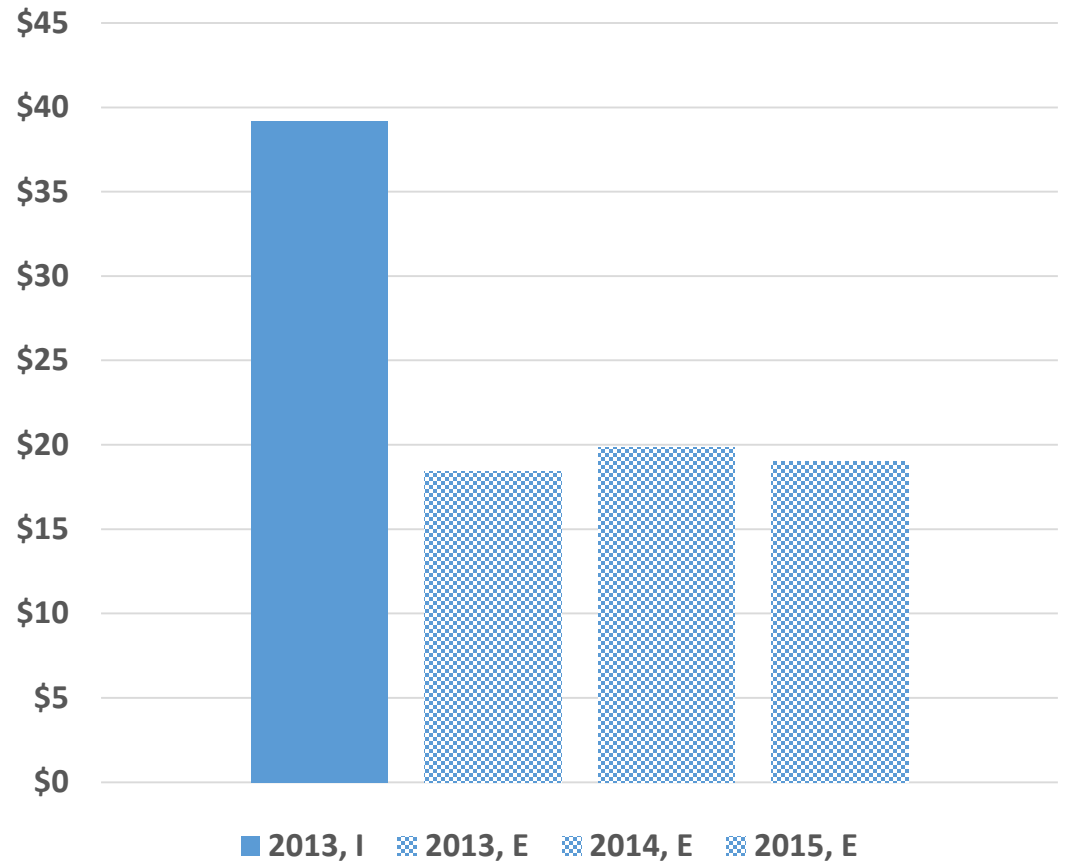
Percent foreign born, nonemployers in NAICS 4853 and other industries, 2013 incumbents and 2013-2015 entrants

Gross Receipts for new entrants falling over time

NAICS 4853



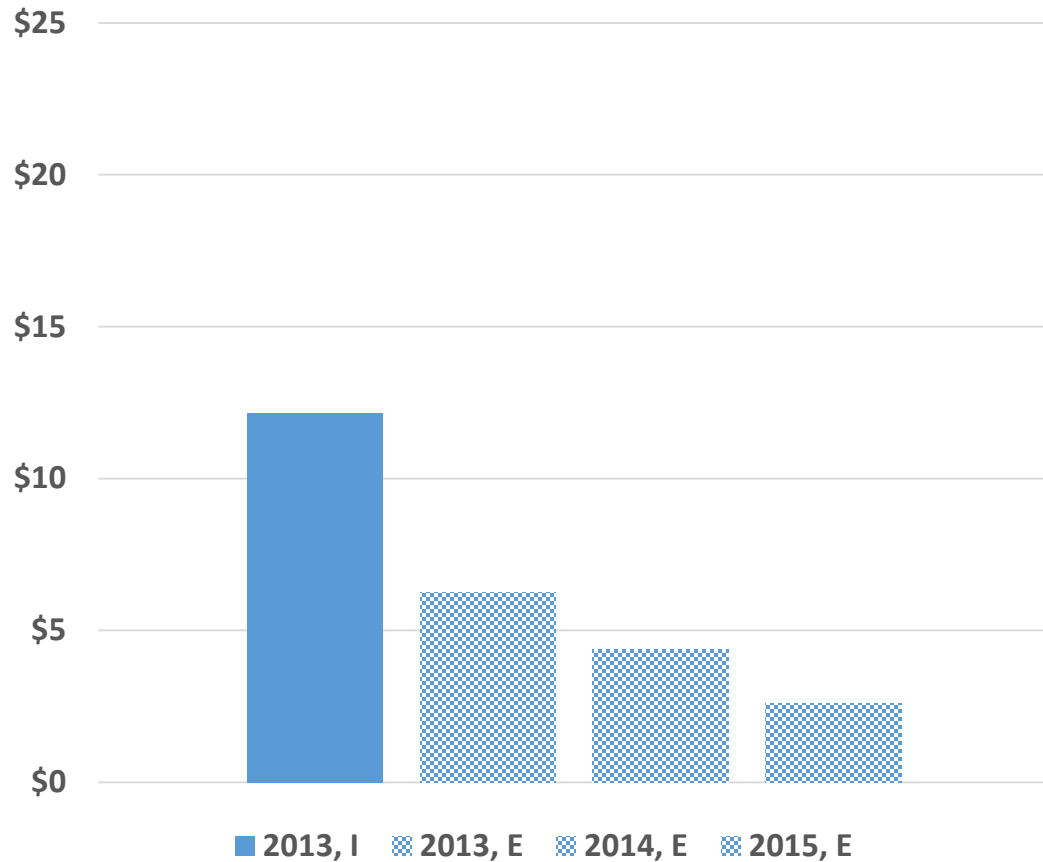
Other industries



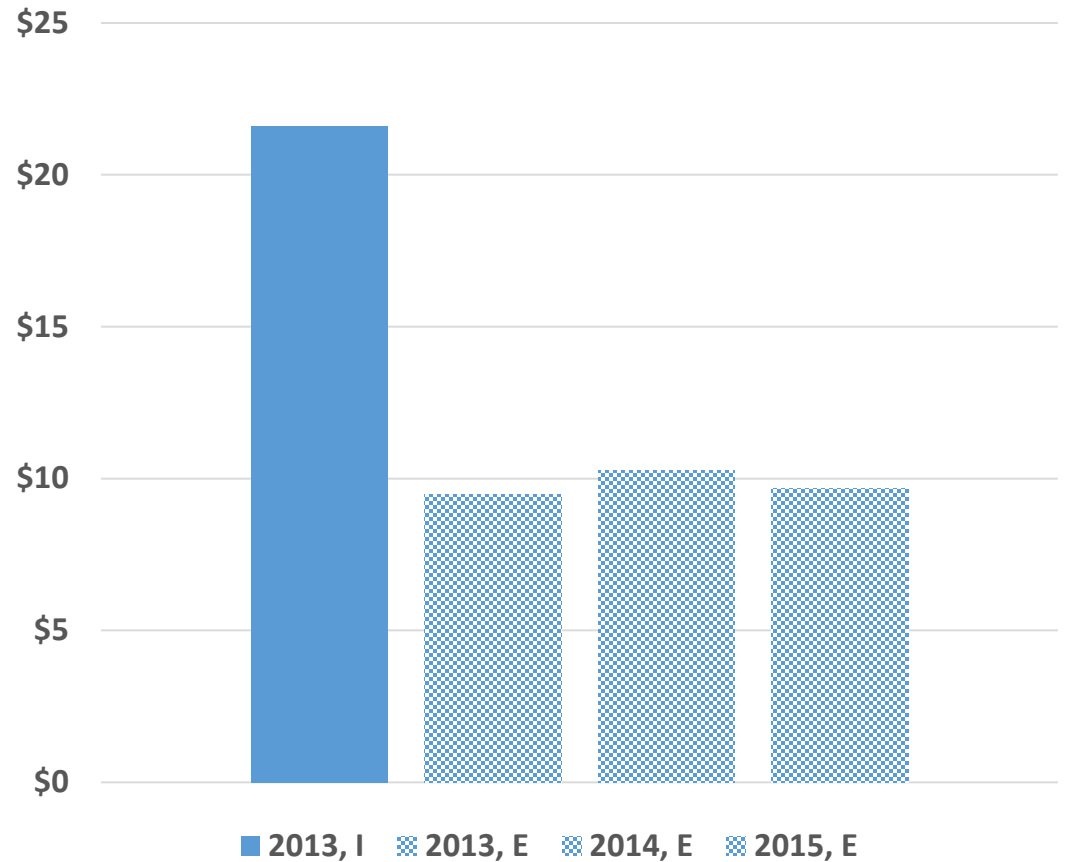
Mean gross receipts (2015 \$000s), nonemployers in NAICS 4853 and other industries, 2013 incumbents and 2013-2015 entrants

Net receipts for new entrants falling over time

NAICS 4853



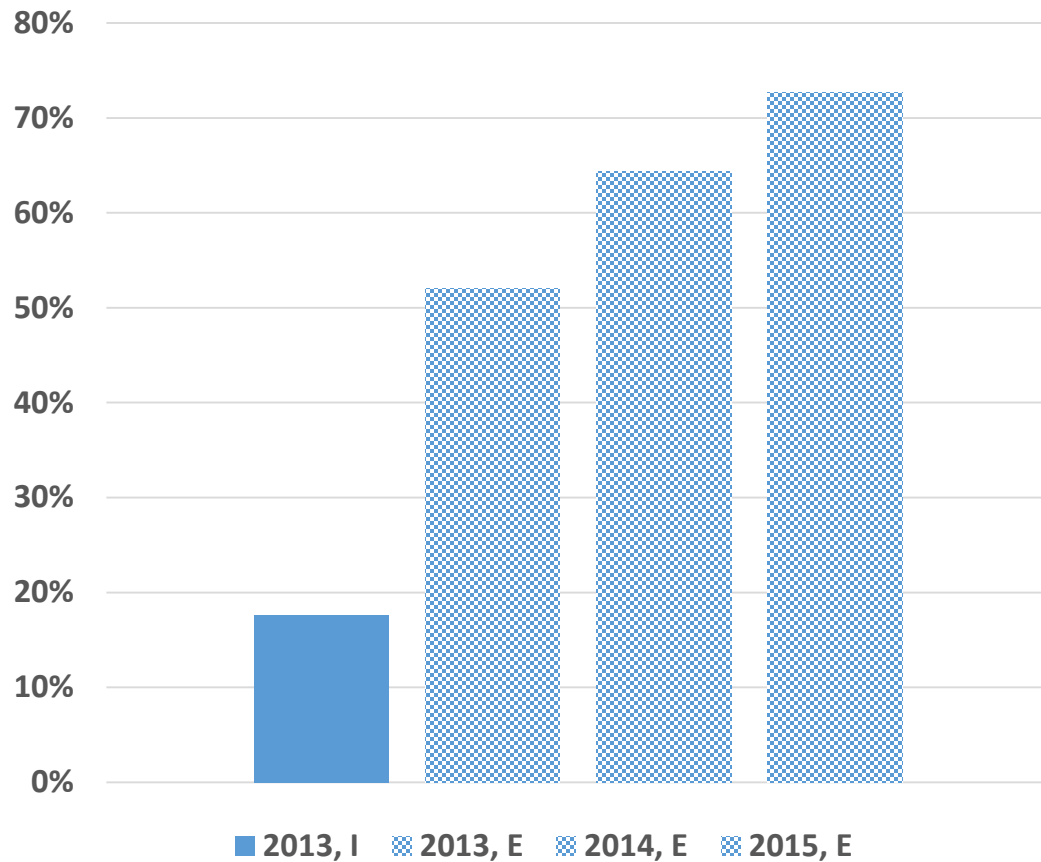
Other industries



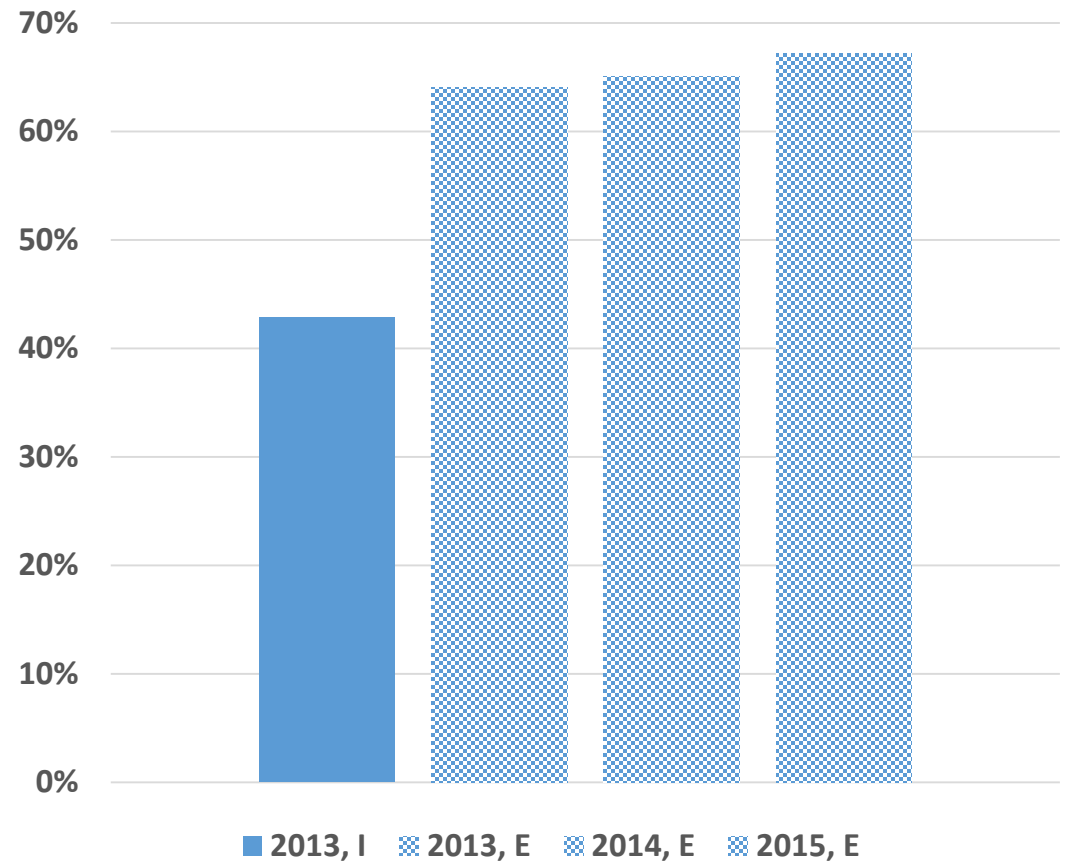
Mean net receipts (2015 \$000's), nonemployers in NAICS 4853 and other industries, 2013 incumbents and 2013-2015

Entrants increasingly likely to combine self-employment with wage and salary work

NAICS 4853



Other industries



Percent with W&S income, nonemployers in NAICS 4853 and other industries, 2013 incumbents and 2013-2015 entrants

How are Earnings Impacted by 4853 Entry?

Earnings loss among workers with WS earnings in previous year, even among workers who retain WS earnings.

This is partially offset by rise in 4853 earnings after accounting for reported expenses

2015 Entrants	WS Both Years	WS Last Year Only	WS Neither Year
W&S Earnings	32,550		
Total Earnings	34,230	7,672	8,447
Δ Gross Receipts 4853	8,450	19,080	<u>19,130</u>
Δ Net Receipts 4853	1,246	6,031	5,667
Δ W&S Earnings	-2,563	-14,030	
Δ Total Earnings	-1,312	-8,094	4,084

Step 3:

What Drives Entry?

“Pull” vs “Push” factors

4853 Rideshare Entry: Push and pull

Data allow us to explore factors that lead people to become a nonemployer sole proprietor

- Push factor: Displacement from a job
 - Defined as separation from a firm where there was a mass displacement
- Pull factor: Lowering of barriers to entry into self-employment (specifically NAICS 4853)
 - Proxied by date that ride sharing platform companies entered a CBSA

Use information on both push and pull to look at entry into self employment as a nonemployer sole proprietor, both in NAICS 4853 and other industries

Add Non-workers to Data Infrastructure

- Use Census Resident Candidate File (RCF) to identify population at risk of entry. RCF contains:
 - all PIKs each year identified as currently resident in the US
 - state and county of the best address for each person
- At risk population for entry to NAICS 4853
 - All people age 14-99 not currently NAICS 4853 nonemployers (N~764 million)
 - For other industries, at risk population defined similarly, but all nonemployers excluded (N~724 million)

Regression specification for entry to NAICS 4853

$$Y_{igt} = X'_{igt}\beta + \delta_g + \delta_t + \gamma_1 Push_{igt-1} + \gamma_2 Pull_{igt} + \gamma_3 Push_{igt-1} * Pull_{igt} + \sum_s (\lambda_s + Pull_{igt-1}) * LM_{s,igt-1} + \varepsilon_{igt}$$

Y is entry into being a nonemployer sole proprietor in NAICS 4853

X variables include sex, age, race, ethnicity, foreign born and education

All models include CBSA and year dummies

Push =1 if individual displaced in prior year, else =0

Pull is years since online ridesharing platform entered geographic area,
= 0 if no entry to date

LM dummy variables for NAICS 4853 capture whether individual had wage income, nonemployer income or both, omitted group has neither; for other industries, dummy only for prior period wage income, omitted group no wage income

Figure 3: : Marginal Effects of Online Platform Availability, Displacement, Labor Market Status and Interactions on Entry into Self-Employment

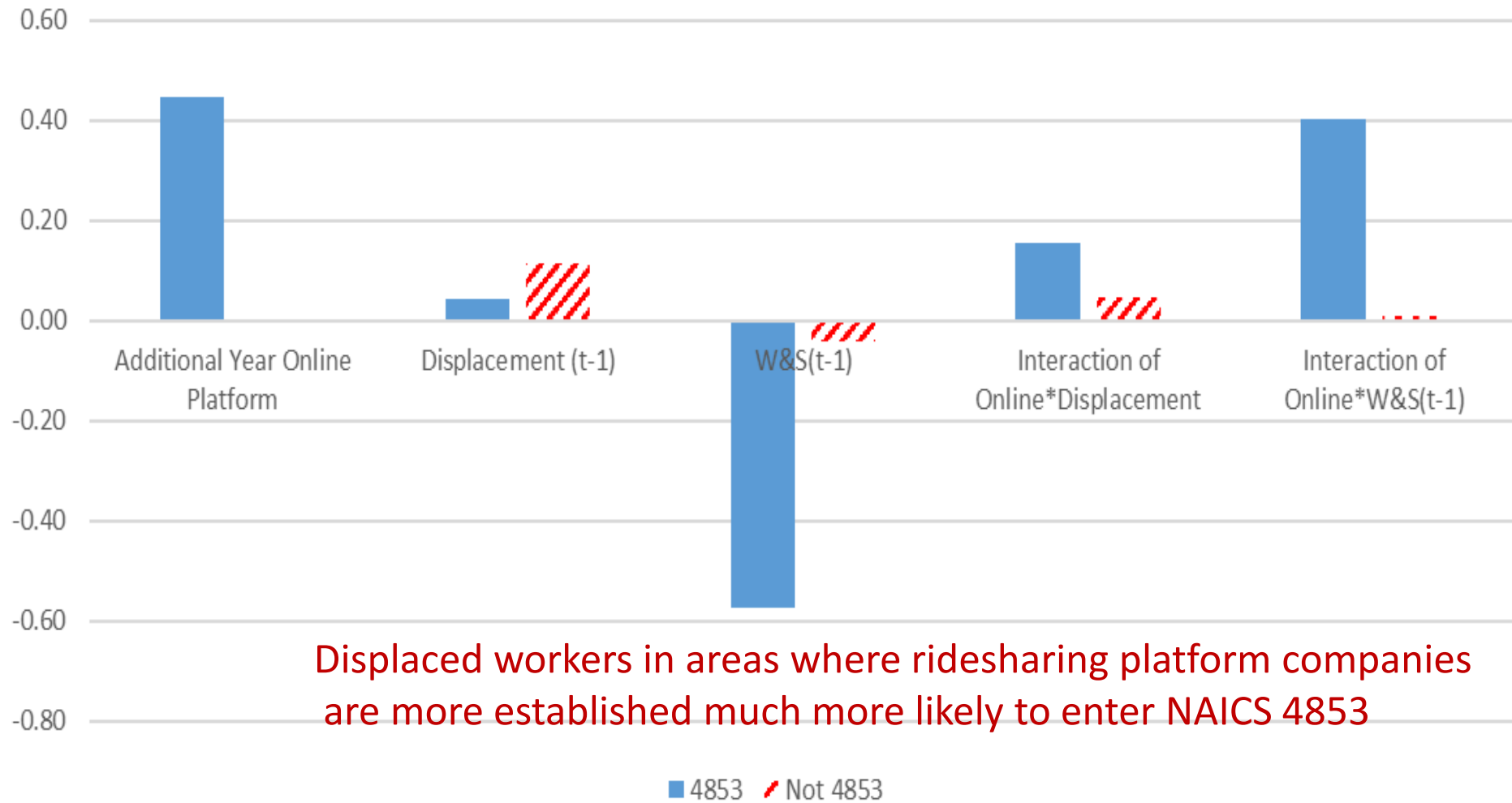
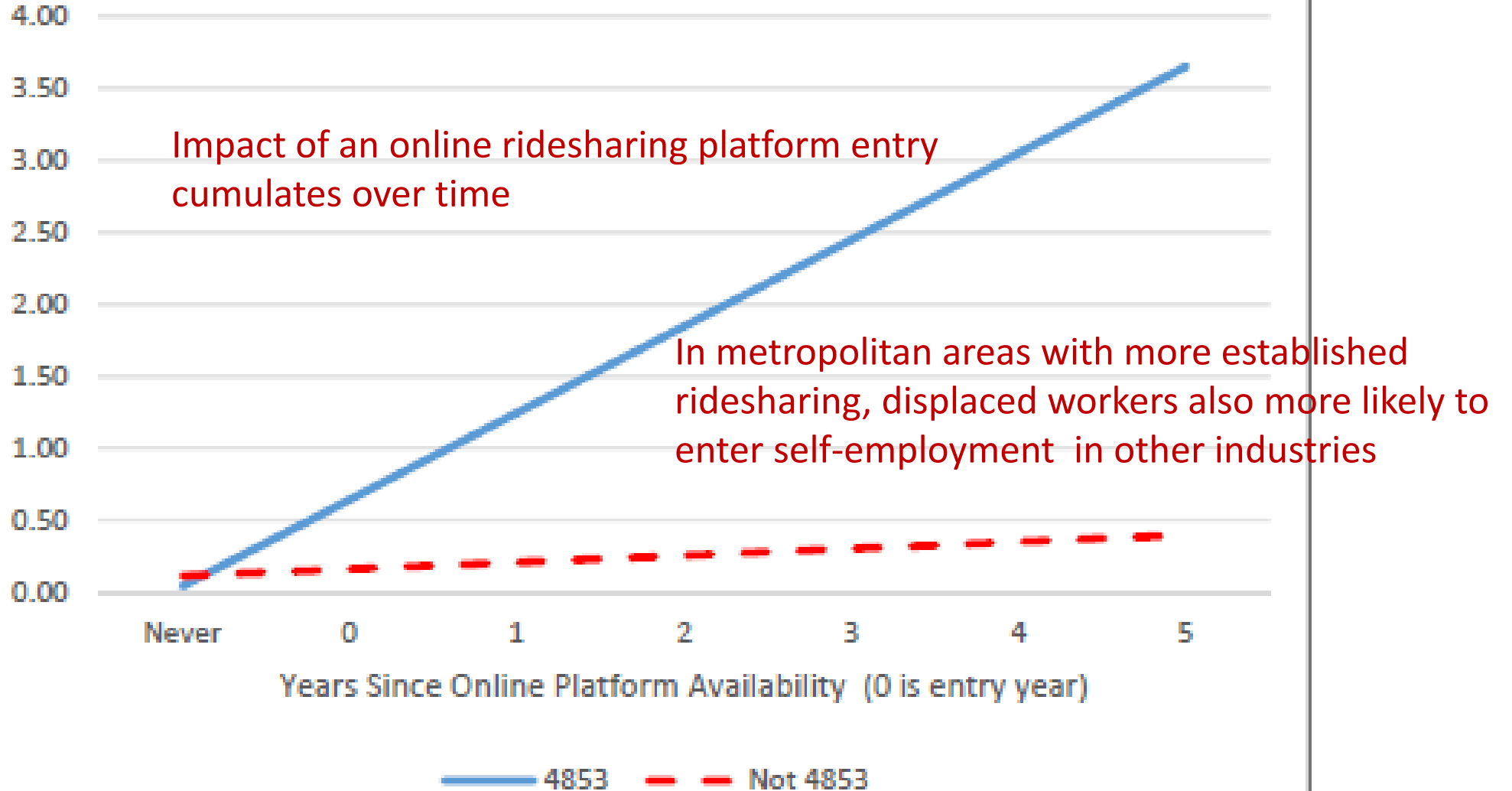


Figure 4: Marginal Effect of Displacement on Entry Rate by Years of Online Platform Availability



Conclusions

- Show how the introduction of online ridesharing platforms has led to significant changes in the Taxi and Limousine Services industry
- Use these same data to take a closer look at what drives entry.
- Find that Push and pull factors both play a role and in fact interact in decision to become a rideshare driver
- Demonstrate that administrative data can, at relatively low cost and without sacrificing representativeness, be used to gain insight into the gig economy.

Conclusions

- Introduction of online ridesharing platforms has lowered cost of entry to self-employment for prospective drivers and led to significant changes in the Taxi and Limousine Services industry
 - Characteristics of new drivers different from those of traditional taxi drivers
 - New drivers much more likely to combine wage and salary work with driving
 - For entrants with prior wage income, income from driving partially offsets losses in wage earnings
- Push and pull factors interact in decision to become a rideshare driver
 - Displaced workers in areas where ridesharing platform companies are more established much more likely to become nonemployers in NAICS 4853
 - Impact of an online ridesharing platform having entered a market cumulates over time (diffusion of information is not immediate)
 - In metropolitan areas with more established ridesharing platform companies, displaced workers also more likely to enter self-employment in other industries (existence leads people to think about online opportunities more generally?)

Nonemployer descriptive statistics: NAICS 4853

	Incumbents	Entrants		
	2013	2013	2014	2015
1 if Female	6.2%	15.5%	16.8%	21.1%
1 if Age 14-34	15.1%	32.9%	36.6%	38.8%
1 if Foreign Born	83.2%	68.9%	62.1%	48.1%
1 if Nonwhite	61.2%	53.7%	49.9%	44.5%
Gross receipts	\$41,840	\$21,340	\$16,160	\$11,450
Net Receipts	\$12,160	\$6,250	\$4,380	\$2,590
1 if W&S Earnings	17.7%	52.1%	64.4%	72.6%
Net Receipts W&S=0	\$13,490	\$9,020	\$7,840	\$5,780
Net Receipts W&S=1	\$5,940	\$3,700	\$2,460	\$1,390
Sample Size (Thousands)	139	58	110	246

- Rapid growth in number of entrants
- Industry becoming more female and younger, less foreign born and nonwhite
- More of those entering industry are combining self-employment with wage and salary work
- Receipts for new entrants are falling

Nonemployer descriptive statistics: Other industries

	Incumbents	Entrants		
	2013	2013	2014	2015
1 if Female	44.6%	47.2%	47.0%	47.4%
1 if Age 14-34	0.2%	37.6%	37.3%	37.8%
1 if Foreign Born	19.8%	20.8%	20.4%	20.6%
1 if Nonwhite	17.8%	24.8%	24.2%	24.5%
Gross receipts	\$39,190	\$18,440	\$19,830	\$19,020
Net Receipts	\$21,620	\$9,480	\$10,270	\$9,680
1 if W&S Earnings	42.9%	64.1%	65.1%	67.2%
Net Receipts W&S=0	\$29,060	\$15,700	\$17,700	\$17,170
Net Receipts W&S=1	\$11,700	\$5,990	\$6,290	\$6,030
Sample Size (Thousands)	12,850	5,664	5,973	5,820

- Number of entrants has been relatively steady
- Entrants are younger and have lower receipts than incumbents
- Characteristics of entrants have not changed much over time

Regression for entry as nonemployer into NAICS 4853

	Mean	Coef	t-stat
1 if Year = 2013	.3339		
1 if Year = 2014	.3395	-.0061	-24.5
1 if Year = 2015	.3267	.0179	49.3
Labor force status last year:			
Wage and salary	.5463	-.0312	-120.9
Non-4853 NonEmp	.0291	-.0839	-119.2
Both W&S and NonEmp	.0224	-.0292	-35.9
1 if displaced last year	.0326	.0023	3.5
Years (+1) that Uber has been in CBSA, 0 if not in CBSA	1.483	.0242	103.3
Interaction with Uber years:			
Wage and salary	.8260	.0218	199.5
Non-4853 NonEmp	.0442	.0769	246.6
Both W&S and NonEmp	.0363	.1021	293.4
Displacement * (Uber years)	.0489	.0084	28.5
R-Squared		.0016	

Dependent Variable = 1 if Enter
Nonemployer Industry 4853,
0 if no entry (*100)

Mean of Dependent Variable =
0.054

Model also includes
demographic variables and
CBSA controls

Regression for entry as nonemployer into other industry

	Mean	Coef	t-stat
1 if Year = 2013	.3343		
1 if Year = 2014	.3401	.1085	65.8
1 if Year = 2015	.3257	.0651	27.0
Labor force status last year:			
Wage and salary	.5759	-.1027	-61.3
1 if displaced last year			
Years (+1) that Uber has been in CBSA, 0 if not in CBSA	1.478	.0019	1.2
Interaction with Uber years:			
Wage and salary	.8703	.0237	33.6
Displacement * (Uber years)			
R-Squared		.0088	

Dependent Variable = 1 if Enter
Nonemployer NOT Industry 4853,
0 if no entry (*100)

Mean of Dependent Variable = 2.411

Model also includes demographic
variables and CBSA controls

Earnings changes for entrants, W&S in prior and current year, NAICS 4853

	2013	2014	2015
Gross Receipts 4853	15,050	11,290	8,450
Net Receipts 4853	3,446	2,277	1,246
Net Receipts non-4853	359	524	432
W&S Earnings	23,410	28,620	32,550
Total Earnings	27,210	31,430	34,230
Δ Gross Receipts 4853	15,050	11,290	8,450
Δ Net Receipts 4853	3,446	2,277	1,246
Δ Net Receipts non-4853	-211	-20	6
Δ W&S Earnings	-4,911	-4,022	-2,563
Δ Total Earnings	-1,675	-1,765	-1,312

Entrants to nonemployment in NAICS 4853 who had wage and salary earnings in both 2014 and 2015 experienced a loss of \$2,563 in W&S earnings in 2015, partially offset by net receipts from driving of \$1,246

Earnings changes for entrants, W&S in prior year but not current year, NAICS 4953

	2013	2014	2015
Gross Receipts 4853	26,220	22,850	19,080
Net Receipts 4853	8,797	7,647	6,031
Net Receipts non-4853	691	1,218	1,641
W&S Earnings			
Total Earnings	9,488	8,865	7,672
Δ Gross Receipts 4853	26,220	22,850	19,080
Δ Net Receipts 4853	8,797	7,647	6,031
Δ Net Receipts non-4853	-629	-335	-95
Δ W&S Earnings	-11,640	-13,400	-14,030
Δ Total Earnings	-3,477	-6,083	-8,094

Entrants to nonemployment in NAICS 4853 who had wage and salary earnings in 2014 but not in 2015 experienced a loss of \$14,030 in W&S earnings in 2015, partially offset by net receipts from driving of \$6,031

Earnings changes for entrants, no W&S in prior or current year, NAICS 4853

	2013	2014	2015
Gross Receipts 4853	28,730	25,490	19,130
Net Receipts 4853	9,105	7,921	5,667
Net Receipts non-4853	1,293	2,090	2,810
W&S Earnings			
Total Earnings	10,400	10,010	8,447
Δ Gross Receipts 4853	28,730	25,490	19,130
Δ Net Receipts 4853	9,105	7,921	5,667
Δ Net Receipts non-4853	-1,982	-1,745	-1,583
Δ W&S Earnings			
Δ Total Earnings	7,122	6,176	4,084

Entrants to nonemployment in NAICS 4853 who had no wage and salary earnings in either 2014 or 2015 had net receipts from driving of \$5,667, more than offsetting a drop in other self-employment earnings of \$1,583