Show and Tell: Online Shopping

Reduced-Form Tax Analysis

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Progress Report

- Presented at the empirical lunch (and survived)
- Began doing some reduced-form analysis

Presentation Debrief

- Presentation went decently well
  - Presented broad ideas of trying to relate online shopping to taxes and time use decisions
  - Introduced question of using dataset to identify sales tax elasticities
  - Introduced dataset
- Overall, people liked the data and were proposing questions
- Liked some of my questions and agreed they were feasible in a reduced-form environment
- Less sure about my approach to creating a model that includes tax, time, and shopping decisions

Reviewing Goolsbee (2000)

- Goolsbee (2000) estimates a probit model of the decision to purchase online after controlling for observables and sales taxes
- Dependent variable is 1 if person has **ever** purchased online and 0 otherwise
- Relies on a proprietary survey from December 1997 and only 20% of his sample had ever purchased anything online
- Estimated elasticity of online buying with respect to the tax price (1 + t) is about 2.3
    - Implies that applying sales tax to online purchases would reduce online shopping by about 24%

Online Shopping Update

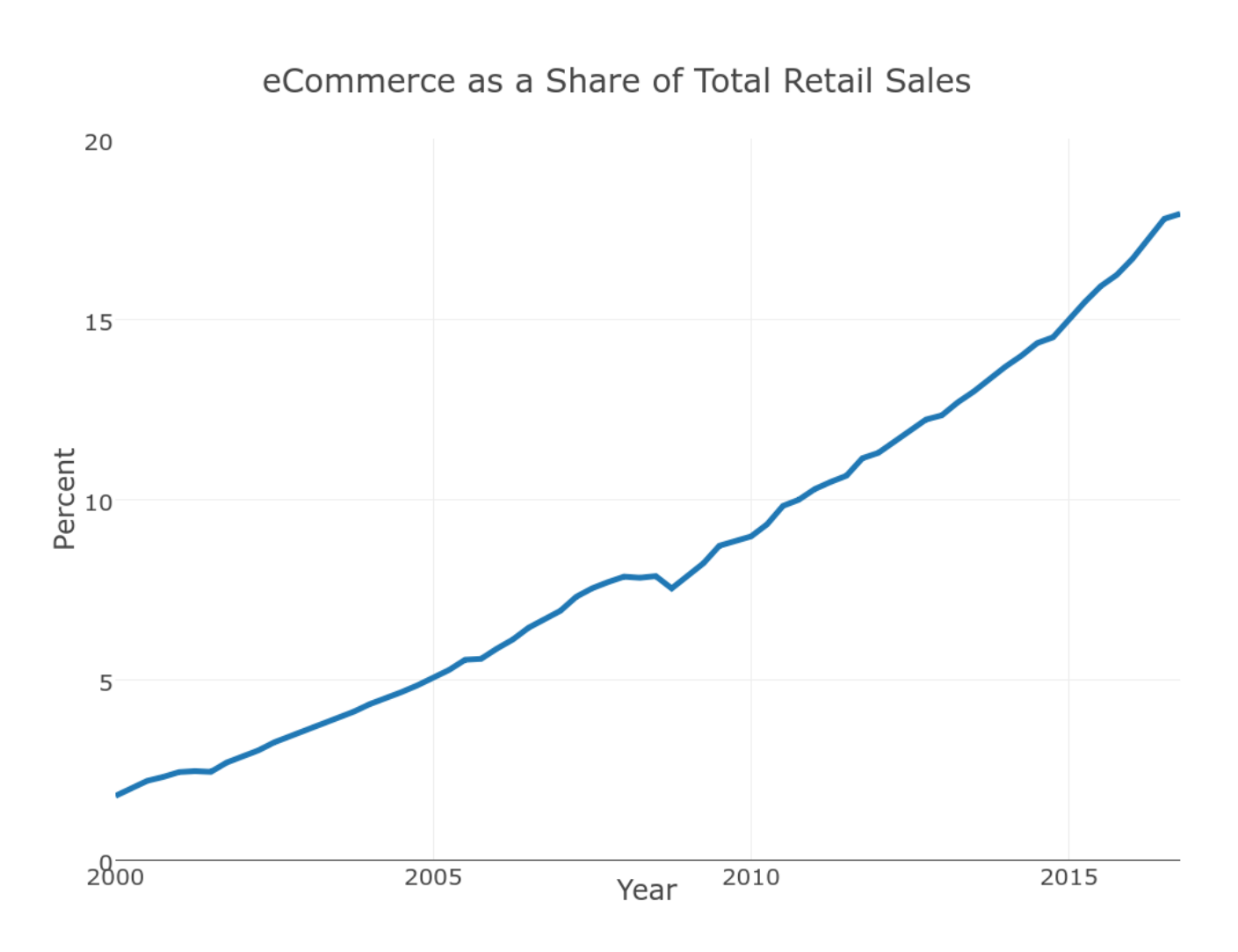

Figure 1: Online Shopping as Share of Total Retail Shopping

Revisiting Goolsbee (2000)

- Online shopping has dramatically changed since December 1997
- Worth re-estimating Goolsbee's model with comScore data
  - Elasticities governing the decision of whether or not to purchase online has likely changed
  - Doubt that cracking down on Amazon has decreased online shopping by 24%
- Interesting to see how elasticities have changed over time
- comScore data is richer than Goolsbee's which allows for closer analysis of shopping behavior beyond the binary purchase decision

Summary Stats

	All online users	Buyers	Nonbuyers
n	558831	270663	288168
t	0.07	0.07	0.07
Income	4.25	4.09	4.41
Age	6.66	6.54	6.78
Asian	0.03	0.03	0.03
Black	0.13	0.09	0.17
Other	0.1	0.07	0.14
White	0.74	0.81	0.67
Hispanic	0.17	0.18	0.15
Children	0.64	0.62	0.66
Household Size	3.06	3.04	3.07

Reduced-Form Analysis Results

	Dependent variable:
	purchase
household_size	−0.003***
	(0.001)
children	0.120***
	(0.004)
racial_backgroundBlack	−0.447***
	(0.005)
racial_backgroundAsian	−0.226***
	(0.010)
racial_backgroundOther	−0.505***
	(0.006)
country_of_origin	−0.103***
	(0.005)
ageGroup25-54	0.226***
	(0.007)
ageGroup55+	0.241***
	(0.008)
incomeGroupLow	−0.154***
	(0.004)
incomeGroupMiddle	−0.124***
	(0.004)
ave_tax	−0.571***
	(0.108)
Constant	0.024**
	(0.011)
Observations	558,831
Log Likelihood	−376,925.100
Akaike Inf. Crit.	753,874.200
Note:	*p<0.1; **p<0.05; ***p<0.01

Goals for Next Meeting

- Figure out what's going on with taxes
- Do reduced-form analysis incorporating the time dimension
  - Specifically incorporate state law changes that forced taxation of online sales (New York started in 2008)
  - Amazon crackdowns are nice natural experiments to do this
  - Could also use opening of Amazon Fulfillment Centers as well

Questions and Suggestions

Any questions or suggestions?

Thanks