How to Make Electronic Commerce Estimates by City

Federation of Tax Administrators
Research and Revenue Estimation Conference
October 2018

Joe Fitz
Chief Economist
California Department of Tax and Fee Administration
Outline

I. Online Sales Trends

II. Statewide Methodology
   A. Business to Consumer (B2C)
   B. Business to Business (B2B)

III. Local (City and County) Methodology
   A. B2C, related to income
   B. B2B, related to establishments
   C. Total uncollected online taxable sales per capita

IV. Results and Generalizations
Online Sales Trends

• Business-to-Consumer (B2C)
  • Census Bureau data indicate that remote sales (traditional mail order and e-commerce) are growing about 12% per year
  • E-commerce portion is 68%; 32% are traditional mail order sales

• Business-to-Business (B2B)
  • In CA, 35% of all taxable remote sales are B2B (Similar to GAO report low end percentage)
  • All B2B online assumed to be e-commerce
  • B2B growing much more slowly than B2C (5% or less per year)
B2C Sales Very Concentrated

- 2012 Economic Census indicates 80% of sales in Electronic Shopping and Mail Order Houses (NAICS 4541) are made by 2% of firms
- 2% of firms is close to 500 companies
- CDTFA research indicates that about 87% of sales of Top 500 firms have nexus in CA
Research Question

Q. What are online sales tax revenue losses for each of 482 cities in CA?
Statewide Estimates (B2C)

- US Census Bureau Data: *Electronic Shopping and Mail Order Houses*; Assume CA population share of US
  - NAICS 4541
    - Includes traditional mail order purchases
    - Monthly Data, Monthly Retail Trade Report; Monthly Retail and Food Services Sales, EXCEL File; [https://www.census.gov/retail/index.html](https://www.census.gov/retail/index.html)

- 69% Taxable Share: US Census Bureau Data; 2012 *Economic Census, Retail Sales, Product Lines*; (Every 5 Years); [https://www.census.gov/data/tables/2012/econ/census/retail-trade.html](https://www.census.gov/data/tables/2012/econ/census/retail-trade.html)
  - Of 31% nontaxable e-commerce, 25% (vast majority) are prescription drugs
  - Most of the rest is food and software downloads (about 2% each)

- Adjust taxable e-commerce sales to reflect use tax payments made (very small adjustment)
Statewide Estimates (B2C, Continued)

- Noncompliance share: Research done by CDTFA staff:
  - Reviewed SEC 10K filings of top 100 to determine foreign sales shares; adjusted sales to reflect US only. (In 2012 only a handful of the top 100 companies reported significant foreign sales in their SEC filings.)
  - CDTFA Staff determined if companies were registered
  - Weighted Average:
    - Top 500
    - All other Internet retailers represented by next 500
  - Result: 23% CA noncompliance sales share
  - Sales growth Forecast: Three-year average (12% per year)
Statewide Estimates (B2B)

Statewide Estimates (B2B, Continued)

- Adjusted to reflect CA exemptions (insurance, agricultural equipment, manufacturing equipment)
- Assumes:
  - 100% compliance for CA sellers
  - 100% compliance for vehicle purchases by businesses
  - 40% of sales made as final sales to businesses (Based on BEA, Census data, also GAO)
  - CA noncompliance 10% of sales for out-of-state sellers (Based on WA research, also GAO)
  - CA GDP share of US
- Sales Forecast: IHS Markit Capital Equipment sales growth rates (Projected to grow 5-7%/year over next few years)
Local Estimates B2C

- Remote sales: e-commerce + traditional mail order
- Remote sales are a function of personal income
  - Regression results, US annual data, 2000 – 2016 (17 years of data)
  - For $100 increase in income, remote sales rise by $4.64
    - With quarterly data over last 4 years, remote sales rise by $8.76 per $100 of income
  - Average taxable e-commerce spending $2.18 per $100 in 2016
- Personal Income per City:
  - Step 1: Initial Estimates
    - Personal income per household x number of households = Personal Income by City
    - E-Commerce: Multiply city personal income by 0.0218
Local Estimates B2C (Continued)

- Summed estimates for cities and unincorporated areas of counties
- **Step 2: Estimates adjusted to sum to statewide total**
  - Adjusted city estimates proportionately by the statewide average difference to reflect CA total when summed
- **Data Sources:**
  - US Census Bureau, 2016 households and mean income per household, “Census Defined Places”
  - Cities and unincorporated places
Local Estimates B2B

- Not have business sales revenues data for cities
- Alternative: B2B sales are a function of numbers of businesses
- US Census Bureau *County Business Patterns*, number of business establishments by city (Businesses with employees)
  - [https://www.census.gov/programs-surveys/cbp.html](https://www.census.gov/programs-surveys/cbp.html)
- Taxable remote business purchases average $11,019 per establishment or (alternatively) $1,009 per city resident
- Multiply establishments by $11,019 to estimate B2B sales by city
Local Taxable E-Commerce Revenues

- Goal is to estimate local online revenues not collected
- Statewide noncompliance rates:
  - B2C 23%
  - B2B 10%
- E-commerce sales activity varies greatly among cities, depending on population, income, and numbers of businesses
- Calculate total e-commerce taxable sales revenue loss base
  - Multiply B2C and B2B sales for each city by respective statewide noncompliance rates
  - Sum B2C and B2B results for each city to get total e-commerce revenue loss base
Results: Local B2C

- Median household income in California is $63,783
- Average household income for cities ranges from a low of $32,357 to a high of $443,403 (Atherton, CA, suburb of San Francisco)
- Taxable Remote purchases per household (Both Collected and Uncollected):
  - Average for all CA cities: $1,172
  - Low: $275  Mendota, CA
  - High: $5,117  Atherton, CA
Results: Local B2B

- Taxable (Both Collected and Uncollected) Online B2B Sales
- Average CA per capita: $1,009
- Low $93 Westmorland, CA
- High $80,807 Vernon, CA
Results: Local Per Capita Online Revenue Losses – Assuming 1% Local Sales Tax Rate

- Assumes average statewide compliance rates
- Local tax rates vary in CA; some are uniform
- Assume 1% rate for comparison purposes
  - Average CA city per capita: $3.49
  - Median CA city per capita: $3.11
  - Low: $0.59 Calipatria, CA
  - High: $81.80 Vernon, CA
Results: Local Per Capita Online Revenue Losses (Continued)

- Revenue results show a distribution closer to normal (median closer to mean) than B2C or B2B viewed independently.
- Still great variation.
Some Generalizations

- E-commerce sales and revenues by city not statistically normal distributions
- Extreme variation in income, B2C remote sales
- Even more extreme variation in B2B online sales
- With large differences in incomes and numbers of businesses, and varying compliance rates, combining B2C and B2B smooths out some variation among CA cities on a per capita basis
- Still a large variation per capita
Some Uncertainties

- B2C and B2B compliance rates may vary locally
- Much uncertainty in B2B purchases
Insights Applicable to Other States?

- If your state (or local officials in your state) have an interest in predicting local e-commerce revenues, you may find some insights from this work to be useful.
- You may also find statewide forecasting insights useful.
- Feel free to contact me if you have any questions.

Joe.fitz@cdtfa.ca.gov
(916) 323-3802
Questions?

Thank You