

How to Make Electronic Commerce Estimates by City

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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>
- 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>
 - 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:
 - Data: *2012 Internet Retailer U.S. Top 500 Report, U.S. Top 1000 Report, Vertical Web Media LLC*
 - 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)

- US Census Bureau Data: “Merchant Wholesale Trade Sales” Survey published by the U.S. Census Bureau, *2016 E-Commerce Multi-sector Report*, U.S. Census Bureau, web site:

<https://www.census.gov/library/publications/2017/econ/2016-e-stats.html>

- Adjusted sales to reflect GAO estimates, United States Government Accountability Office, *Sales Taxes: States Could Gain Revenue from Expanded Authority, but Businesses Are Likely to Experience Compliance Costs*, <https://www.gao.gov/products/GAO-18-114>



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 5-7⁰%/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>
- 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

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Questions?

Thank You