E-Cigarette Taxation: Potential Impact & Options

Frank J. Chaloupka, University of Illinois at Chicago
Society for Research on Nicotine and Tobacco
Chicago, Illinois, March 5, 2016
Overview

• Demand for E-Cigarettes
  – Effects of prices on e-cigarette demand
  – Cross-price, other effects

• ENDS Taxation – Options
  • Potential e-cigarette tax revenues
Disclosures

• National Cancer Institute, State and Community Tobacco Control Initiative, 5U01-CA154248
• Centers for Disease Control and Prevention, Office on Smoking and Health
• American Cancer Society, Cancer Action Network
Collaborators

• Jidong Huang
• John Tauras
• Cezary Gwarnicki
• Xin Xu
• Michael Pesko
• Sherry Emery
• Lloyd Johnston
• Richard Miech

• Michal Stoklosa
• Jeffrey Drope
• Megan Diaz
• Ralph Caraballo
• Roy Wada
• Ken Warner
• David Sweanor

www.tobacconomics.org
E-Cigarette Demand
Disposable ENDS
Sales Volume and Price, US 2010 - 2014

Sales Volume (Thousand of Pieces)
Sales Prices (Real 2014 Q4 Dollars)

Real Price
Volume
E-Cigarette Prices & Sales

• Huang, et al., Tobacco Control, 2014
  • 2010-2012, quarterly e-cigarette sales data
  • Overall sales of e-cigarettes are sensitive to price changes
  • A 10% increase in price reduces sales of disposable e-cigarettes by approximately 12%, and by about 19% for reusable e-cigarettes.
  • Sales of disposable e-cigarettes were higher in markets with stronger SFA policies.
  • No consistent statistical significant relationship between cigarette prices and e-cigarette sales.
  • Increasing reusable e-cigarette price will lead to an increase in disposable e-cigarette sales.
E-Cigarette Prices & Sales

• Gwarnicki, et al. (under review)
  • 2010-2014, quarterly e-cigarette and other nicotine product sales data
  • Overall sales of e-cigarettes are sensitive to price changes
  • 10% increase in price reduces sales of disposable e-cigarettes by between 9% and 16%.
  • 10% increase in price of rechargeable e-cigarettes reduces sales by between 14% and 24%
  • Generally positive associations between cigarette prices and e-cigarette sales, implying substitution from cigarettes to e-cigarettes in response to increases in the relative price of cigarettes
Number of Nielsen Markets with E-cigarette Sales

Number of Markets


0 10 20 30 40 50

4 16 24 32 53
E-Cigarettes and NRT Sales

• Diaz, et al. (in progress)
  • 2009-2014, quarterly e-cigarette and nicotine replacement product sales data
  • Assess the entry of e-cigarettes into Nielsen markets, e-cigarette prices, and e-cigarette sales on sales of NRT products
  • Preliminary findings include:
    • E-cigarette entry associated with reduced sales of NRT patches and gum
    • Greater e-cigarette sales volume generally associated with reduced NRT sales
    • Evidence of substitution based on positive cross-price effects
E-Cigarette Prices & Sales

- Stoklosa, Drope & Chaloupka (under review)
  - 2011-2014 monthly data on e-cigarette sales in six EU countries (Estonia, Ireland, Latvia, Lithuania, Sweden, and UK)
  - Own price elasticities range from -0.83 to -0.87
  - E-cigarette sales generally positively associated with cigarette prices, but mostly not statistically significant
Impact of Price on E-cigarette Use

Methods:

– Nationally representative 2013 online survey
  • 7,522 U.S. adults from GfK’s Online Knowledge Panel.
– Survey data were linked with Nielsen e-cigarette retail prices
  • separately for disposable and reusable e-cigarette
– Weighted survey logistic regression analysis
  • ever use and current use
  • Control for cigarette price, demographics, and socioeconomic

www.tobacconomics.org
Impact of Price on E-cigarette Use

Summary:

– 15% of respondents reported ever using e-cigarettes
– 5.1% reported current use
– young adults and cigarette smokers had the highest odds of both ever use and current use.
– Higher disposable e-cigarette prices correlated with lower odds of ever use
  • estimated own price elasticity ranges from -0.81 to -0.98
– Neither rechargeable e-cigarette price nor combustible cigarette price was found associated with e-cigarette ever use
– No significant interactions were discovered between e-cigarette or cigarette price and e-cigarette current use.

www.tobacconomics.org
Youth E-Cigarette and Cigarette Use
Middle & High School Students,
Use in past 30 days, 2014-2015

<table>
<thead>
<tr>
<th>Grade</th>
<th>2014 Cigarettes</th>
<th>2014 E-Cigarettes</th>
<th>2015 Cigarettes</th>
<th>2015 E-Cigarettes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th</td>
<td>4.0%</td>
<td>8.7%</td>
<td>9.5%</td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>4.0%</td>
<td>7.2%</td>
<td>6.3%</td>
<td>14.0%</td>
</tr>
<tr>
<td>12th</td>
<td>4.0%</td>
<td>7.2%</td>
<td>6.3%</td>
<td>14.0%</td>
</tr>
</tbody>
</table>

Source: Monitoring the Future, 2015
Impact of Price on E-cigarette Use

Pesko, et al. (in progress):

- 2014 Monitoring the Future data on youth use of e-cigarettes
- Nielsen scanner price data
- Preliminary estimates suggest very large effects of price on youth
- Next steps: add 2015 data
Impact of Price on E-cigarette Use

Research Needs:

– Better measures of e-cigarette costs, which distinguish initial fixed costs on devices and recurring costs on e-juices, are needed

– Better measures of e-cigarette use (frequency, intensity, device type) are needed
ENDS Taxation
Rationale for ENDS Taxation

- Improve Public Health
  - Encourage switching from combusted to potentially ‘less harmful’ products
  - Prevent youth initiation
- Raise Revenue
  - Revenue replacement
Mechanics of ENDS Taxes

• How to tax?
  • Specific vs. *ad valorem*?

• What to tax?
  • All products/components vs. e-juice?
  • Only products that contain nicotine?
  • All nicotine vs. nicotine derived from tobacco?

• Where to collect tax?
  • Distributor vs. retailer?
  • Need for licensing
ENDS Taxation

- Minnesota, North Carolina, Louisiana and DC currently tax ENDS
  - 95% of wholesale price in MN; 67% in DC
  - 5 cents per ml in NC, LA
- Kansas tax goes into effect July 2016
  - 20 cents per ml
- Local ENDS taxes:
  - Petersburg AK (45% of wholesale price)
  - Mat Su Borough, AK (55% of wholesale price)
  - Chicago (80 cents per unit, plus 55 cents per ML)
- Many others have proposed or are considering
ENDS Taxation

• Low tax relative to cigarette, OTP taxes
  • Little impact in reducing use, uptake
  • Encourages dual use
  • Maximize incentives to switch from combustibles to ENDS
  • Minimal new revenue

• ENDS tax equivalent to cigarette tax
  • Significant impact on use, uptake
  • Little incentive to switch from combustibles to ENDS
  • Modest new revenue
Optimizing ENDS Taxation

• Significant tax on ENDS coupled with increased taxes on cigarettes and other combustible tobacco products
  • Maintain or increase relative price of combustibles
  • Maximize switching while discouraging initiation and dual use
  • Generates significant new revenues
Estimated Size of the Vapor Market

Vapor Market Size
$3.5 B

- E-Cigarettes $1.5B
  - Tracked Channels (Nielsen) $700M
  - Non-Tracker Channels $800M
- Vapor/Tanks/Mods $2.0B
  - Online $400M
  - Vape Shops $1.2B
  - C-store, Food, Drug, Mass Retail Channels $400M
- Other $400M

Source: Presentation: Development of Premium E-Flavors and Market Analysis
Note: Other Non-Tracker channels include tobacco-only outlets and other e-cig retail locations
Potential ENDS Tax Revenues

- Assume own-price elasticity of -1.5 based on published Nielsen data analysis
- Assume same elasticity in other market segments
- Calculate new sales and tax revenues
  - CA:
    - 20% tax – revenues around $18.7 million
    - 40% tax – revenues around $21.4 million
    - $1.00 cigarette tax increase (almost 20% price increase) generates nearly $550 million in new revenue
Summary

– Taxes on disposable and rechargeable e-cigarettes will reduce sales

– Taxes on disposable e-cigarettes likely to reduce e-cigarette ever use (trial use and experimentation)

– Cigarettes and e-cigarettes increasingly appear to be substitutes for one another

– E-cigarettes appear to be substitutes for nicotine replacement products

– ENDS taxes will generate new revenues, but relatively modest (at least in the short term)

– Differential taxes and cigarettes and ENDS have potential to significantly improve public health

www.tobacconomics.org