

CIGARETTE TAXES AND SMUGGLING 2010

**BY MICHAEL LAFAIVE
AND TODD NESBIT, PH.D.**

An Update of Earlier Research



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By Michael LaFaive and
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This PDF of the study corrects several minor editing errors that occurred in the original PDF. These errors do not appear in the print version of the study.

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Executive Summary

Between January 2007 and 2009, 21 of the 48 contiguous states — including tobacco state North Carolina — raised their cigarette taxes, producing a total of 27 tax hikes. In 2010, tobacco state South Carolina and five other states did the same.

This study updates the Mackinac Center’s 2008 publication “Cigarette Taxes and Smuggling: A Statistical Analysis and Historical Review” to reflect state and federal cigarette tax hikes through fiscal 2009. The original study used data through fiscal 2006.

Our new estimates indicate that in 2009, the state of Michigan ranked 10th in the nation* in smuggled cigarettes as a percentage of total in-state cigarette consumption — 26 percent. The five smuggling destination states with the highest cigarette smuggling rates were Arizona (51.8 percent of the state’s total consumption); New York (47.5 percent); Rhode Island (40.5 percent); New Mexico (37.2 percent); and California (36.3 percent).

* Our model provides cigarette smuggling estimates for 47 of the 50 states. Hawaii, Alaska and North Carolina (a premier source of smuggled cigarettes) are excluded from the results.

According to our calculations, Arizona’s inbound smuggling rate was not in the top five in 2006, yet we estimate that Arizona now has the nation’s highest inbound cigarette smuggling rate, with over half of all cigarette consumption coming from smuggled sources. This is probably a function of the state’s 2006 excise tax hike, the 2009 federal excise tax hike and Arizona’s proximity to Mexico.

The study also breaks smuggling rates into two primary types of smuggling: “casual” and “commercial.”† Casual smuggling typically involves individuals crossing borders to obtain their cigarettes for personal use. It may also involve purchases made over the Internet. Commercial smuggling involves larger, typically long-haul efforts, such as transporting cigarettes from North Carolina (a typical source state) to Michigan or elsewhere.

† A third type of smuggling is estimated as well: smuggling imports from Mexico and smuggling exports to Canada. In our model, such estimates primarily affect border states.

In the casual smuggling category, Michigan’s smuggling rate ranks 5th in the nation, at 11.6 percent of total in-state cigarette consumption. Only New York (19.9 percent), Rhode Island (18.2 percent), Washington (14.5 percent) and Montana (13.2 percent) residents crossed into neighboring jurisdictions for lower-taxed cigarettes more often than those of the Great Lakes State. Remarkably, New York state earned the number one spot even before hiking state taxes by \$1.60 per pack in 2010. Anecdotal evidence suggests that this recent hike has been a boon to Pennsylvania retailers just across the Empire State’s border.

The states with the top inbound commercial cigarette smuggling rates are New Jersey (29.1 percent); New York (28.5 percent); Vermont (24.2 percent); Massachusetts (23.3 percent); and Connecticut (20.9 percent).

Five smuggling destination states moved up by double digits between 2006 and 2009 in our state rankings of net smuggling rates: Texas, from 16th to 6th; Mississippi, from 37th to 22nd; South Dakota, from 28th to 12th; Maryland, from 24th to 9th; and Iowa, from 33rd to 15th. These large smuggling rate increases relative to those of other states can likely be attributed to the five states' substantial state excise tax increases over the past three years. Texas increased its per-pack cigarette tax from 41 cents to 141 cents in 2007; Mississippi, from 18 cents to 68 cents in 2009; South Dakota, from 53 cents to 153 cents in 2007; Maryland, from 100 cents to 200 cents in 2008; and Iowa, from 36 cents to 136 cents in 2007.

Despite the notable cigarette tax hikes in recent years, other proposals are being floated around the country. In 2009, Michigan Gov. Jennifer Granholm suggested raising cigarette taxes to \$2.25 per pack, up from \$2.00 per pack. That proposal never came to fruition, but we estimate that had it become law, illicit cigarette trafficking would have leapt to 28.3 percent of Michigan's total cigarette consumption. In Illinois, according to our calculations, a proposed \$1.00-per-pack cigarette tax hike would cause cigarette smuggling to increase from a modest 5.9 percent of total in-state consumption to 24.3 percent.

Smuggling is not the only unintended consequence of high cigarette taxes. Tax-induced smuggling can also lead to violence against people, police and property, and encourage sizable and brazen theft. The authors recommend reducing state and local cigarette taxes as a way to thwart smuggling and other unintended consequences.

Introduction

Cigarette excise taxes have been a constant topic of discussion in state capitols around the nation during the past two years.

It is not hard to imagine why. In December 2007, America slipped into the “Great Recession,” and state tax revenues plummeted across the nation.

Faced with a choice between cutting expenditures and raising taxes, some legislators proposed cigarette tax increases. The hikes were also promoted to the public as a way to improve public health. From 2007 through 2009, 21 of the 48 contiguous states — including tobacco state North Carolina — raised cigarette taxes, producing a total of 27 tax hikes. In 2010, tobacco state South Carolina raised cigarette taxes, as did five other states.*

But cigarette tax hikes can produce unintended consequences.

In December 2008, we published, together with a third co-author, a comprehensive 90-page study titled “Cigarette Taxes and Smuggling: A Statistical and Historical Review.”[†] The study, issued by the Mackinac Center for Public Policy, included a statistical model designed to estimate interstate and international smuggling in the United States, while also discussing cigarette tax-related violence, theft and financing of terrorism. This study updates those estimates and complements the original work.

* South Carolina, Hawaii, New Mexico, New York and Utah all raised taxes on July 1, 2010, and Washington state did so on May 1. Hawaii is scheduled to raise taxes again in 2011. As discussed below, these recent tax hikes are excluded from our new cigarette smuggling estimates because the complete dataset of state cigarette taxes runs only through fiscal 2009. The Aloha State is excluded from the estimates because it is not one of the 48 contiguous states.

† Michael D. LaFaive, Patrick Fleenor and Todd Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 1, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010). The third co-author of the study was Patrick Fleenor, a principal at Fiscal Economics, a Washington, D.C.-based consultancy.

Summary of Earlier Findings

The economic model in our 2008 analysis was used to estimate smuggling rates for 47 of the 50 states, producing annual averages from 1990 through 2006 and single-year estimates for 2006. At the time, 2006 was the last year for which complete data were available.

We broke the smuggling data into categories, reporting the amounts of “casual” and “commercial” smuggling. Casual smuggling involves cross-border shopping, typically by individuals for their own consumption. Commercial smuggling typically employs large trucks that travel greater distances than, say, an adjacent state to acquire cigarettes. We also provided estimates for smuggling imports from Mexico and smuggling exports to Canada.

Our previous study included detailed histories and analyses of Michigan, California and New Jersey. The Mackinac Center is a Michigan-based think tank, and we focused on New Jersey and California to underscore the degree to which cigarette taxes have led to similar problems in different parts of the country with long smuggling histories.*

In April 2009, we updated our original estimates to include the new federal excise cigarette tax rate,[†] which had just been raised by 61.66 cents per pack, from 39 cents to 100.66 cents, effective April 1.¹ Our revised estimates for 1990 through 2006 indicated that Michigan’s average annual total smuggling was 19.1 percent of the state’s total cigarette market. That is, 19.1 percent of all cigarettes, legal and illegal, consumed each year in Michigan were obtained by illicit means. The total smuggling rate for New Jersey during that same 17-year period was a more modest 15.0 percent, while California clocked in at 29.5 percent. One reason for California’s high rate was its shared border with Mexico, a significant source of contraband cigarettes.^{‡2}

The three states’ estimated total smuggling rates generally grew from 1990 through 2006, with the rates in 2006 being higher than the average rates for the period. According to our 2009 calculations for 2006, 31.0 percent of all cigarettes consumed in Michigan were smuggled that year. In New Jersey, the figure was 38.4 percent, and in California, it was 34.6 percent (see Graphic 1). Remarkably, California did not have the highest smuggling import rates in the nation. This honor went to tiny Rhode Island at 43.2 percent. (Note that the rates in Graphic 1 are negative if the cigarettes are smuggled into the state and positive if they are smuggled out.)

* Michael D. LaFaive, Patrick Fleenor and Todd Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 22-65, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010). The other states’ data were added to our modeling effort not just to provide a broader picture of U.S. cigarette smuggling, but also to give the model itself greater variability — that is, changes to measure.

† In creating the new estimates, we included tax and sales data for the years 2007, 2008 and 2009. These new data produced adjustments in our estimates of long-term smuggling trends and hence in our single-year estimates for 2006.

‡ For more on international smuggling, see “The Rise of Foreign Suppliers” in LaFaive, Fleenor and Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 63, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

1 “Tobacco: Federal Excise Tax Increase and Related Provisions” (U.S. Department of the Treasury, Alcohol and Tobacco Tax and Trade Bureau) http://www.ttb.gov/main_pages/schip-summary.shtml (accessed Dec. 12, 2010).

2 LaFaive, Fleenor and Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

Graphic 1: State Cigarette Smuggling as a Percentage of Total State Cigarette Consumption (Legal and Illegal), 2006 (Calculated in 2009)

State	Per-Adult Legal Sales in Packs	Estimated Smuggling Rates			
		Commercial Smuggling (Interstate)	Casual Smuggling (Interstate)	Smuggling Involving Canada/Mexico	Total
AL	83.30	-2.06%	1.48%	0.00%	-0.55%
AR	81.40	-4.73%	0.83%	0.00%	-3.86%
AZ	54.50	-7.17%	-7.37%	-12.10%	-32.11%
CA	32.90	-6.99%	-8.55%	-14.65%	-34.55%
CO	53.10	-7.58%	-8.26%	0.00%	-16.63%
CT	50.90	-19.99%	6.22%	0.00%	-12.34%
DE	183.60	-5.51%	64.24%	0.00%	61.52%
FL	71.90	-0.57%	-6.27%	0.00%	-6.88%
GA	68.20	-1.20%	1.44%	0.00%	0.26%
IA	85.30	-0.84%	-1.58%	0.00%	-2.44%
ID	58.80	-5.14%	9.44%	1.30%	5.99%
IL	51.50	-12.63%	-1.00%	0.00%	-13.75%
IN	98.70	-4.67%	14.84%	0.00%	10.83%
KS	55.40	-7.08%	-10.45%	0.00%	-18.44%
KY	145.30	0.00%	6.40%	0.00%	6.40%
LA	77.30	-0.94%	-5.40%	0.00%	-6.40%
MA	44.10	-21.82%	3.49%	0.00%	-17.54%
MD	48.90	-12.70%	2.06%	0.00%	-10.38%
ME	64.80	-25.16%	4.35%	2.21%	-16.59%
MI	56.50	-21.14%	-9.53%	1.85%	-31.02%
MN	55.60	-13.78%	-9.67%	1.43%	-23.59%
MO	105.10	2.30%	9.18%	0.00%	11.28%
MS	92.20	1.83%	-0.16%	0.00%	1.67%
MT	51.60	-14.72%	-14.76%	1.41%	-31.18%
ND	73.70	-2.04%	-1.84%	0.87%	-3.01%
NE	59.50	-4.84%	-6.75%	0.00%	-11.99%
NH	135.50	-8.02%	33.81%	1.33%	29.70%
NJ	37.70	-26.58%	-8.29%	0.00%	-38.42%
NM	35.40	-8.37%	-9.47%	-16.89%	-39.92%
NV	68.50	-8.98%	3.86%	0.00%	-4.78%
NY	32.40	-19.74%	-15.50%	2.03%	-35.81%
OH	70.50	-14.45%	1.16%	0.00%	-13.09%
OK	87.20	-10.90%	1.15%	0.00%	-9.60%
OR	54.70	-11.19%	-8.56%	0.00%	-21.14%
PA	62.40	-17.55%	3.93%	0.00%	-12.85%
RI	47.30	-15.69%	-19.08%	0.00%	-43.23%
SC	96.40	3.61%	4.70%	0.00%	8.13%
SD	69.20	-3.57%	-1.70%	0.00%	-5.34%
TN	98.70	1.47%	3.10%	0.00%	4.51%
TX	54.30	-1.54%	-2.04%	-10.66%	-14.75%
UT	34.50	-6.06%	-6.38%	0.00%	-12.89%
VA	78.90	0.00%	23.48%	0.00%	23.48%
VT	63.90	-14.17%	6.71%	1.69%	-4.54%
WA	33.70	-23.44%	-13.44%	2.04%	-38.18%
WI	71.30	-6.09%	-6.47%	0.00%	-13.10%
WV	112.20	-4.21%	12.07%	0.00%	8.38%
WY	78.80	-4.96%	5.26%	0.00%	0.57%

Notes: Estimates computed based on regression results. The smuggling percentage is negative when the state is a net importer of smuggled cigarettes, and the percentage is positive when the state is a net exporter of smuggled cigarettes. The sum of commercial, casual and Canada/Mexico smuggling does not equal the totals presented in the final column due to the nonlinear nature of the model. North Carolina, Hawaii and Alaska are not included.

A Short Description of the Model

Several years and many cigarette tax hikes have passed since we first obtained the data necessary to publish our original estimates of smuggling rates. To update our research with three additional years of data, we recently reran the model we constructed in 2008. That model was built only after an extensive review of the academic literature yielded strong evidence that substantial cigarette smuggling exists. These studies included, but were not limited to:

- “How Far to the Border?: The Extent and Impact of Cross-Border Cigarette Smuggling,” by Michael Lovenheim and published in the *National Tax Journal* in March 2008. Lovenheim found that “between 13 and 25 percent of [U.S.] consumers purchase cigarettes in border localities.”^{*, 3}
- “Excise Tax Avoidance: The Case of State Cigarette Taxes,” a May 2008 working paper by Philip DeCicca, Donald Kenkel and Feng Liu. This study used 2003 survey data to estimate the percentage of smokers in each of the 50 states and the District of Columbia who were casual cigarette smugglers. In a 2010 update of the study, the authors estimated that in 2003, 6.2 percent of Michigan’s smokers engaged in casual cigarette smuggling.[†]
- “Cigarette Tax Avoidance and Evasion,” by Mark Stehr and published in the *Journal of Health Economics* in March 2005. Stehr found that “up to 85 percent of the tax paid sales response”⁴ was due to tax avoidance, rather than actual reductions in tobacco use.[‡]

The simplest way to describe our model is that it compares legal, per-capita sales of cigarettes to survey data on the percentage of smokers in each state. The difference between legal sales and reported rates of smoking provides a basis for estimating a state’s smuggling rate.[§] If the difference is positive, it indicates that the state is exporting cigarettes to other locations, making the state a “source state” for smuggled cigarettes. If the difference is negative, it indicates the state is importing cigarettes from elsewhere, making the state a “destination state” for smuggled cigarettes. A fuller treatment of the model’s construction — including a description of important variables — is provided in the Appendix.

The model contains a variable to measure the degree of international smuggling between the United States and Mexico or Canada. In these estimates, shipments are assumed to go only one way: from Mexico to the United States, or from the United States to high-tax Canada — not the other way around.

* In 2010, economist David Merriman published his paper “The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Packs in Chicago.” Merriman found that about 75 percent of the discarded cigarette packs collected in Chicago were not acquired there. Slightly more were smuggled from Indiana than were found to have the Chicago tax stamp. David Merriman, “The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Packs in Chicago,” *American Economic Journal: Economic Policy* 2, no. 2, 61 (2010).

† See Philip DeCicca, Donald S. Kenkel and Feng Liu, “Excise Tax Avoidance: The Case of State Cigarette Taxes” *NBER Working Paper Series* (2010): 56 (Table 2). In the course of our research, we produced annual smuggling rates for each of the 47 states in our model. Our unpublished estimate is that in 2003, 7.9 percent of Michigan’s total cigarette consumption involved casual smuggling imports — reasonably consistent with the figure produced by DeCicca, Kenkel and Liu. Their estimate of the percentage of Michigan smokers who casually smuggled in 2007 was 7.23 percent, while our casual smuggling estimate for that year is 8.39 percent of state consumption — reasonably close again. DeCicca, Kenkel and Liu, “Excise Tax Avoidance: The Case of State Cigarette Taxes,” *NBER Working Paper Series* (2010): 54 (Table 2).

‡ Other useful U.S.-specific studies included R. Morris Coats, “A Note on Estimating Cross-Border Effects of State Cigarette Taxes,” *National Tax Journal* 48, no. 4 (1995); and Jerry G. Thursby and Marie C. Thursby, “Interstate Cigarette Bootlegging: Extent, Revenue Losses, and Effects of Federal Intervention,” *National Tax Journal* 53, no. 1 (2000).

§ The model is not designed specifically to capture smoking “intensity”— the amount smoked by people per day, for instance — but it does include a national trend variable reflecting the almost linear decline in U.S. smoking intensity over time.

3 Michael F. Lovenheim, “How Far to the Border?: The Extent and Impact of Cross-Border Casual Cigarette Smuggling,” *National Tax Journal* 61, no. 1 (2008): 7.

4 Mark Stehr, “Cigarette Tax Avoidance and Evasion,” *Journal of Health Economics* 24 (2005).

While the model includes two other countries in its calculations, it excludes two American states — Alaska and Hawaii — from smuggling measurements. These two states present unique challenges to modeling smuggling because they are not contiguous to the continental United States. North Carolina is also excluded from the model, since it is the model’s base source stage for commercially smuggled cigarettes, and other states’ taxes are measured against its own.*

New Smuggling Estimates

Our estimates indicate that in 2009, the five destination states with the highest inbound cigarette smuggling rates were Arizona, where it represented 51.8 percent of the state’s total consumption; New York, where it represented 47.5 percent; Rhode Island, with 40.5 percent; New Mexico, with 37.2 percent; and California, with 36.3 percent. (See Graphic 2.) Arizona was not in the top five when we updated the 2006 numbers in 2009, yet we estimate that Arizona now has the nation’s highest inbound cigarette smuggling rate, with over half of all of the state’s cigarette consumption coming from smuggled sources.

This is noteworthy. In 2007, Arizona had already increased its state excise tax on cigarettes from 118 cents per pack to 200 cents,⁵ but in 2009, the U.S. government increased the federal cigarette excise tax from 39 cents per pack to 100.66 cents.⁶ Together, these tax changes resulted in a full 143.66-cent-per-pack increase, raising the incentive to smuggle cigarettes from Mexico to Arizona.[†]

Since our 2009 revision, five destination states have moved up by double digits in the state rankings of net smuggling rates: Texas, from 16th to 6th; Maryland, from 24th to 9th; South Dakota, from 28th to 12th; Iowa, from 33rd to 15th; and Mississippi, from 37th to 22nd. These large smuggling rate increases relative to those of other states can likely be attributed to the five states’ substantial state excise tax increases during the past three years. Texas increased its per-pack cigarette tax from 41 cents to 141 cents in 2007;⁷ Mississippi, from 18 cents to 68 cents in 2009;⁸ South Dakota, from 53 cents to 153 cents in 2007;⁹ Maryland, from 100 cents to 200 cents in 2008;¹⁰ and Iowa, from 36 cents to 136 cents in 2007.¹¹

Similarly, four states declined by double digits in state rankings of net smuggling rates: Illinois, from 17th to 30th; Pennsylvania, from 21st to 31st; Massachusetts, from 13th to 32nd; and Nevada, from 29th to 41st. While many other states since 2006 have approved increases in their cigarette excise taxes, none of these four states had changed their cigarette tax rate by the close of fiscal 2009.[‡] As neighboring states increased their tax rates, the average cross-border tax differential of these four states consequently declined, leading to a decrease in net smuggling into the state or even an increase in net smuggling out of the state.

* North Carolina frequently plays this role in statistical studies of cigarette smuggling. Because North Carolina’s tax differential with itself would be zero, and because cigarettes would not be smuggled from North Carolina to itself, including the state in the study could bias the estimates.

† The increase in the federal excise tax in 2009 can also help explain Texas’ rise in the rankings of net smuggling imports as a percent of consumption.

‡ Pennsylvania did raise its cigarette tax in November 2009, after the end of the 2009 fiscal year. “The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009” (Arlington, Va.: Orzechowski and Walker, 2009), 10.

5 “The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009” (Arlington, Va.: Orzechowski and Walker, 2009), 9.

6 “Tobacco: Federal Excise Tax Increase and Related Provisions” (U.S. Department of the Treasury, Alcohol and Tobacco Tax and Trade Bureau) http://www.ttb.gov/main_pages/schip-summary.shtml (accessed Dec. 12, 2010).

7 “The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009” (Arlington, Va.: Orzechowski and Walker, 2009), 10.

8 *Ibid.*, 9.

9 *Ibid.*, 10.

10 *Ibid.*, 9.

11 *Ibid.*

At the far end of the spectrum, five source states had estimated net total smuggling exports that exceeded 10 percent of total state consumption: Virginia, Delaware, West Virginia, Missouri and Wyoming. (North Carolina would certainly be on this list as well, were it not excluded from the model due to its treatment as the base source of commercial smuggling.) Delaware and Virginia in particular stand out; smuggling out of Delaware is estimated at more than 28 percent of its in-state consumption, while smuggling out of Virginia is estimated at more than 56 percent of its in-state consumption. These high estimated rates are not surprising. Delaware's state excise tax of 115 cents per pack* is safely below the rates of its neighboring states, with Maryland at 200 cents per pack, New Jersey at 257.5 cents per pack and Pennsylvania at 135 cents per pack. Similarly, Virginia's cigarette excise tax of 30 cents per pack is safely below the tax rates of its neighbors.

* Delaware raised its state cigarette tax to \$1.60 per pack after the conclusion of fiscal 2009. "The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009" (Arlington, Va.: Orzechowski and Walker, 2009), 9.

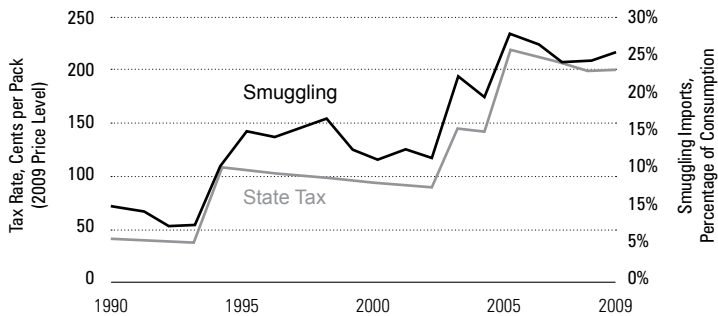
Graphic 2: State Cigarette Smuggling as a Percentage of Total State Cigarette Consumption (Legal and Illegal), 2009

State	Per-Adult Legal Sales in Packs	Estimated Smuggling Rates				Rank by Net Smuggling Into State		
		Commercial Smuggling (Interstate)	Casual Smuggling (Interstate)	Smuggling Involving Canada/Mexico	Total	2009 Rank	2006 Rank	Rank Change
AZ	28.60	-8.56%	-9.81%	-18.94%	-51.84%	1	7	6
NY	24.80	-28.46%	-19.87%	4.87%	-47.53%	2	5	3
RI	44.70	-12.39%	-18.23%	0.00%	-40.53%	3	1	-2
NM	32.70	-5.72%	-4.12%	-23.57%	-37.15%	4	2	-2
CA	28.80	-4.25%	-8.54%	-18.46%	-36.29%	5	6	1
TX	42.30	-8.76%	2.07%	-24.13%	-33.29%	6	16	10
WA	30.10	-19.74%	-14.45%	4.15%	-31.75%	7	4	-3
NJ	32.60	-29.11%	0.37%	0.00%	-28.61%	8	3	-5
MD	35.40	-18.92%	-5.97%	0.00%	-26.43%	9	24	15
MI	50.60	-16.62%	-11.64%	3.52%	-26.04%	10	9	-1
WI	53.30	-12.36%	-10.96%	0.00%	-25.72%	11	18	7
SD	49.70	-10.78%	-10.98%	0.00%	-23.72%	12	28	16
MT	49.80	-11.84%	-13.16%	2.83%	-23.52%	13	8	-5
MN	48.70	-11.79%	-11.38%	3.02%	-21.05%	14	10	-4
IA	53.80	-9.07%	-9.47%	0.00%	-19.98%	15	33	18
OR	48.40	-9.09%	-9.07%	0.00%	-19.28%	16	11	-5
CO	46.00	-5.74%	-9.80%	0.00%	-16.23%	17	14	-3
KS	49.10	-5.10%	-9.67%	0.00%	-15.38%	18	12	-6
UT	27.60	-4.69%	-8.96%	0.00%	-14.10%	19	20	1
CT	45.90	-20.87%	6.93%	0.00%	-12.14%	20	22	2
ME	52.30	-20.48%	2.59%	4.34%	-11.94%	21	15	-6
MS	89.50	-3.22%	-5.68%	0.00%	-9.17%	22	37	15
OH	61.60	-11.46%	2.03%	0.00%	-9.16%	23	19	-4
AR	72.60	-9.17%	0.29%	0.00%	-8.84%	24	31	7
VT	48.90	-24.22%	8.86%	5.15%	-7.21%	25	30	5
OK	79.00	-9.50%	2.39%	0.00%	-6.87%	26	25	-1
NE	59.80	-3.08%	-3.58%	0.00%	-6.81%	27	23	-4
LA	82.60	-0.10%	-6.62%	0.00%	-6.74%	28	27	-1
FL	70.50	0.10%	-6.47%	0.00%	-6.36%	29	26	-3
IL	45.20	-10.60%	4.26%	0.00%	-5.94%	30	17	-13
PA	59.20	-14.80%	9.07%	0.00%	-4.38%	31	21	-10
MA	34.60	-23.33%	18.37%	0.00%	-1.73%	32	13	-19
ND	72.90	-0.97%	-2.72%	2.07%	-1.56%	33	32	-1
TN	77.00	-3.55%	3.64%	0.00%	0.23%	34	38	4
IN	78.90	-8.59%	8.70%	0.00%	0.88%	35	43	8
GA	58.80	-0.27%	1.87%	0.00%	1.61%	36	35	-1
AL	75.60	-1.08%	4.06%	0.00%	3.02%	37	34	-3
KY	126.40	-2.64%	5.62%	0.00%	3.17%	38	40	2
ID	52.40	-3.36%	5.41%	3.15%	5.30%	39	39	0
NH	116.60	-7.86%	11.86%	2.30%	7.79%	40	46	6
NV	53.50	-9.78%	16.63%	0.00%	7.92%	41	29	-12
SC	85.00	3.54%	5.89%	0.00%	9.20%	42	41	-1
WY	76.70	-3.58%	13.57%	0.00%	10.47%	43	36	-7
MO	97.20	2.44%	9.45%	0.00%	11.66%	44	44	0
WV	115.80	-2.78%	15.31%	0.00%	12.97%	45	42	-3
DE	122.80	-10.46%	34.88%	0.00%	28.55%	46	47	1
VA	73.40	1.28%	55.44%	0.00%	56.33%	47	45	-2

Notes: Estimates computed based on regression results presented in columns 3 and 4 of Graphic 12 (see the Appendix). The smuggling percentage is negative when the state is a net importer of smuggled cigarettes, and the percentage is positive when the state is a net exporter of smuggled cigarettes. The sum of commercial, casual and Canada/Mexico smuggling does not equal the totals presented in the final column due to the nonlinear nature of the model. North Carolina, Hawaii and Alaska are not included.

The state of Michigan has the 10th highest 2009 smuggling rate among 47 contiguous states. As Graphic 3 suggests, the smuggling rate for Michigan mirrors its tax rate. (Note that the numbers on the right-side axis indicate rates of smuggling *imports* and thus are the negative of the smuggling rates reported in other graphics.)

Graphic 3: Michigan Cigarette Tax Rates and Estimated Total Smuggling Import Rates, 1990-2009



Casual Smuggling

States with the highest rates of overall smuggling do not necessarily have the highest rates of casual, commercial or international smuggling. In the category of casual smuggling, which involves smaller purchases, usually for personal use, the top five destination smuggling rates are in New York, 19.9 percent; Rhode Island, 18.2 percent; Washington, 14.5 percent; Montana, 13.2 percent; and Michigan, 11.6 percent.

The estimated casual smuggling rates are directly related to the excise taxes in neighboring states. In our 2008 study, we obtained private cigarette sales data, categorized by ZIP code, from a large Midwestern wholesaler. We were then able to see how distributor sales to Michigan's border counties changed after Indiana and Wisconsin hiked their cigarette taxes by 44 cents per pack and 100 cents per pack, respectively.¹² These hikes meant that Indiana and Wisconsin's cigarette prices, which had been considerably lower than high-tax Michigan's prices, were only somewhat lower. Just as economic theory would suggest, the distributor's cigarette sales to Michigan's Indiana and Wisconsin border counties increased by 53.2 percent and 8 percent, respectively.¹³ Residents of Michigan's border counties now had less incentive to drive to Wisconsin and Indiana for cigarettes, and many began buying their smokes close to home.

Of course, large-scale casual smuggling tends to occur when a neighboring state has relatively low cigarette tax rates. Among these source states, Virginia tops the chart with the staggering estimate that 55.4 percent of its total in-state cigarette consumption is casually smuggled out of the state. Virginia's cigarette tax rate is only 30 cents per pack, while Maryland's is \$2.00 per pack and the District of Columbia's is \$2.50 per pack.*

* Although our model did not include smuggling into the District of Columbia, other researchers have estimated it to have very high inbound smuggling rates. One study estimated the District of Columbia's inbound smuggling at 18.45 percent of its cigarette consumption (see DeCicca, Kenkel, and Liu, "Excise Tax Avoidance: The Case of State Cigarette Taxes," *NBER Working Paper Series* (2010): 53, Table 2.); a second study placed it at 63 percent (see Lovenheim, "How Far to the Border?: The Extent and Impact of Cross-Border Casual Cigarette Smuggling," *National Tax Journal* 61, no. 1 (2008): 29). While the two estimates vary widely, both sets of researchers, using different methodologies, placed Washington, D.C., at or near the top of U.S. smuggling rates, with Lovenheim ranking it first in the nation, and DeCicca et al. ranking it second.

¹² "The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009" (Arlington, Va.: Orzechowski and Walker, 2009), 9, 10.

¹³ LaFaive, Fleenor and Nesbit, "Cigarette Taxes and Smuggling" (Mackinac Center for Public Policy, 2008), 84, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

Graphic 4: Top Five Casual Smuggling Import and Export States by Percentage of Total State Cigarette Consumption (Legal and Illegal), 2009

State	Casual Smuggling Rank	Casual Smuggling (Interstate)	Commercial Smuggling (Interstate)	Smuggling Involving Canada/Mexico	Total	Rank by Overall Net Smuggling Into State
NY	1	-19.87%	-28.46%	4.87%	-47.53%	2
RI	2	-18.23%	-12.39%	0.00%	-40.53%	3
WA	3	-14.45%	-19.74%	4.15%	-31.75%	7
MT	4	-13.16%	-11.84%	2.83%	-23.52%	13
MI	5	-11.64%	-16.62%	3.52%	-26.04%	10
WV	43	15.31%	-2.78%	0.00%	12.97%	45
NV	44	16.63%	-9.78%	0.00%	7.92%	41
MA	45	18.37%	-23.33%	0.00%	-1.73%	32
DE	46	34.88%	-10.46%	0.00%	28.55%	46
VA	47	55.44%	1.28%	0.00%	56.33%	47

Notes: Estimates computed based on regression results presented in columns 3 and 4 of Graphic 12 (see the Appendix). The smuggling percentage is negative when the state is a net importer of smuggled cigarettes, and the percentage is positive when the state is a net exporter of smuggled cigarettes. The sum of commercial, casual and Canada/Mexico smuggling does not equal the totals presented in the final column due to the nonlinear nature of the model. North Carolina, Hawaii and Alaska are not included.

As we noted in our 2008 study, casual smuggling also occurs over the Internet. Some overseas websites actually advertise the fact that they are not allowed to share their customers' purchase and contact data with taxing authorities outside their own nation.¹⁴

In 2010, President Barack Obama signed the Prevent All Cigarette Trafficking Act, which prohibits the United States Postal Service from delivering cigarettes through the mail, among other restrictions.¹⁵ This is not the only law on the books designed to thwart cigarette sales over the Internet,* but it is the newest. For instance, the Jenkins Act of 1949 mandates that American companies report sales information, including the quantity and the purchasers' names, to states into which they have shipped their products. States have used this law to track their residents' out-of-state cigarette purchases and to demand the state cigarette taxes owed to their treasuries.¹⁶

Cigarette sales from foreign websites that sell cigarettes are not subject to the Jenkins Act. It remains to be seen how the new federal Prevent All Cigarette Trafficking Act will affect these sales. The site Nativeblend.net is already advertising that it can help smokers beat the PACT Act with its private delivery system. Graphic 5 shows a screen shot from the Nativeblend.net website, which practically taunts federal authorities with its willingness to assist smokers in evading taxes.

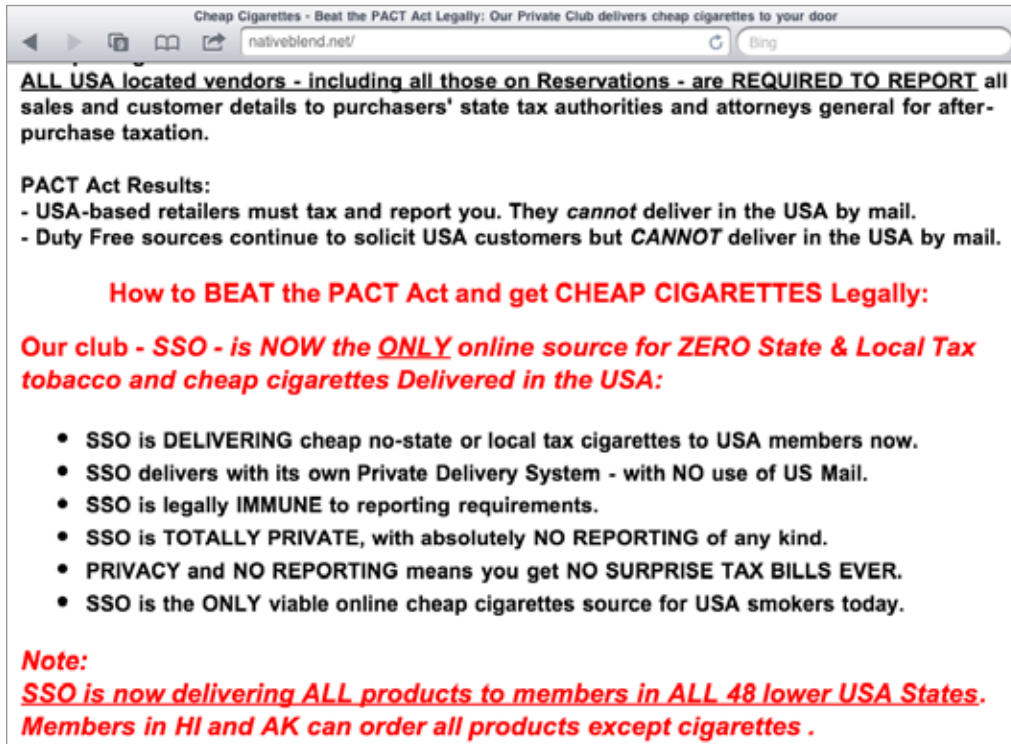
* For a fascinating paper on Internet-based cigarette sales, see Austan Goolsbee, Michael F. Lovenheim and Joel Slemrod, 2010, "Playing with Fire: Cigarettes, Taxes, and Competition from the Internet," *American Economic Journal: Economic Policy*, American Economic Association, vol. 2(1), Pages 131-54, February.

14 LaFaive, Fleenor and Nesbit, "Cigarette Taxes and Smuggling" (Mackinac Center for Public Policy, 2008), 57, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

15 "The Library of Congress (Thomas): Bill Text, 111th Congress (2009-2010), S.1147. Enr" (Library of Congress) <http://thomas.loc.gov/cgi-bin/query/D?c111:4:./temp/~c111aKNmSz::> (accessed Dec. 12, 2010).

16 Frank J. Chaloupk et al., "Enhancing Compliance with Tobacco Control Policies," *Stanford Working Paper Series*, SAN08-07 (2008): 7.

Graphic 5: Nativeblend.net Website on “How to BEAT the PACT Act”



Casual Web-Based Smuggling in Michigan

According to a spokesman for the Michigan Department of Treasury, more than 23,000 Michigan residents are known to have bought cigarettes online between February 2005 and August 2008. Their total tax liability to the state is computed at more than \$36 million.¹⁷ In a November 2010 e-mail, the Treasury spokesman claims that Michigan residents' Internet purchases of cigarettes have dropped precipitously in recent years:

The contact and revenue data/information I had sent previously was accurate. As noted in a recent e-mail, ... the department experienced a nearly 70% drop-off in sales data between 2007 and 2008. We have experienced another 25% drop-off in sales data since.

Treasury has sent out approximately 200 subpoenas (citing the Jenkins Act) over the last year or so, however there has been very little compliance. Vendors are often located out of state, in foreign countries, or on Native American lands, which makes enforcement difficult.

It appears that some of the sellers that had been cooperating (per the Jenkins Act) likely had customers turn elsewhere, as some sellers have advertised that they would not share customer lists with taxing authorities.¹⁸

¹⁷ LaFaive, Fleenor and Nesbit, "Cigarette Taxes and Smuggling" (Mackinac Center for Public Policy, 2008), 49, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

¹⁸ Terry Stanton, e-mail correspondence with Michael LaFaive, Nov. 3, 2010.

Commercial Smuggling

Commercial smuggling, which involves large-scale, long-distance transport, also plays a major role in cigarette trafficking. Because it requires significant organizational abilities, the distribution networks of organized crime syndicates have long been involved in the smuggling of cigarettes.*

We estimate that the destination states with the top five rates of inbound, commercially smuggled cigarettes are New Jersey, at 29.1 percent of the state's total consumption; New York, at 28.5 percent; Vermont, at 24.2 percent; Massachusetts, at 23.3 percent; and Connecticut, at 20.9 percent. Our calculations also suggest that two of these five states have experienced significant increases in their rates of commercial smuggling. We estimate that between 2006 and 2009, New York's commercial smuggling rate leapt nearly 9 percentage points, from 19.7 to 28.5 percent, while Vermont's leapt 10 percentage points, from 14.2 percent to 24.2.

* For more on this subject, see Edward L. Hudgins, "Memo to the Mafia: Smuggle Cigarettes," *Regulation*, Spring 1998: 49. A 2009 paper from The Royal Canadian Mounted Police reports that some 100 organized gangs smuggle cigarettes for profit in Canada alone. See "Contraband Tobacco Enforcement Strategy: Progress Report" (Royal Canadian Mounted Police, 2009), 8, <http://www.rcmp-grc.gc.ca/ce-da/tobac-tabac/tobacco-tabac-2009-eng.pdf> (accessed Oct. 20, 2010).

Graphic 6: Top Five Commercial Smuggling Import and Export States by Percentage of Total State Cigarette Consumption (Legal and Illegal), 2009

State	Commercial Smuggling Rank	Commercial Smuggling (Interstate)	Casual Smuggling (Interstate)	Smuggling Involving Canada/Mexico	Total	Rank by Overall Net Smuggling Into State
NJ	1	-29.11%	0.37%	0.00%	-28.61%	8
NY	2	-28.46%	-19.87%	4.87%	-47.53%	2
VT	3	-24.22%	8.86%	5.15%	-7.21%	25
MA	4	-23.33%	18.37%	0.00%	-1.73%	32
CT	5	-20.87%	6.93%	0.00%	-12.14%	20
LA	43	-0.10%	-6.62%	0.00%	-6.74%	28
FL	44	0.10%	-6.47%	0.00%	-6.36%	29
VA	45	1.28%	55.44%	0.00%	56.33%	47
MO	46	2.44%	9.45%	0.00%	11.66%	44
SC	47	3.54%	5.89%	0.00%	9.20%	42

Notes: Estimates computed based on regression results presented in columns 3 and 4 of Graphic 12 (see the Appendix). The smuggling percentage is negative when the state is a net importer of smuggled cigarettes, and the percentage is positive when the state is a net exporter of smuggled cigarettes. The sum of commercial, casual and Canada/Mexico smuggling does not equal the totals presented in the final column due to the nonlinear nature of the model. North Carolina, Hawaii and Alaska are not included.

These increases in the model's commercial smuggling estimates reflect large cigarette excise tax increases in both states. In Vermont, taxes were hiked in July 2008 and July 2009 by 20 cents and 25 cents per pack, respectively, and the tax now totals \$2.24 per pack.¹⁹ In New York, taxes were raised in 2008 by \$1.25 per pack, resulting in a tax of \$2.75 per pack.^{†,20}

New York's sky-high tax rates also help explain why Pennsylvania is a net export state with regard to casual smuggling. Pennsylvania's cigarette tax rate is \$1.60 per pack,²¹ and we estimate that in 2009, 9.1 percent of Pennsylvania's entire

† In 2010, New York hiked its cigarette taxes by \$1.60 per pack, leaving the tax at \$4.35 per pack. See "Enacted State Cigarette Excise Tax Rates Effective July 2010" (National Conference of State Legislatures, 2010), <http://www.ncsl.org/?tabid=14349> (accessed Oct. 21, 2010). This new rate was not included in our model, which estimates smuggling rates through fiscal 2009 only.

¹⁹ "The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009" (Arlington, Va.: Orzechowski and Walker, 2009), 10.

²⁰ Ibid.

²¹ Ibid.

in-state cigarette consumption was casually smuggled out of the state. Anecdotal evidence suggests that the rate would leap upwards should we update our model with 2010 data.*

Mexico and Canada

In the model, we limited estimates of international smuggling to Canada and Mexico, because they are the major countries contiguous to the U.S. mainland.† As in our previous analyses, Mexico played a considerable role in the estimated smuggling rates of four states: Arizona, New Mexico, California and Texas. Indeed, almost 24 percent of New Mexico's in-state cigarette consumption is estimated to have originated in Mexico.‡

Canada plays a different role in American cigarette smuggling. Canadians are frequently acquiring their cigarettes in the United States — even, our model suggests, from relatively high-tax states.

According to our estimates, in 2009, 10 states “exported” smuggled cigarettes to Canada: Vermont, at 5.2 percent of its consumption; New York, at 4.9 percent; Maine, at 4.3 percent; Washington, at 4.1 percent; Michigan, at 3.5 percent; Idaho, at 3.1 percent; Minnesota, at 3.0 percent; Montana, at 2.8 percent; New Hampshire, at 2.3 percent; and North Dakota, at 2.1 percent. Our estimates for each state's smuggling exports to Canada in 2009 are higher than our previous estimates for their exports in 2006.

† Of course, Canada and Mexico are not the only source countries for international cigarette smuggling into the United States. As our 2008 report indicated, international cigarette smuggling is a widespread problem that produces the same unintended consequences as tax-induced interstate cigarette smuggling. For more on this subject, see “Tobacco Underground” (The Center for Public Integrity) <http://www.publicintegrity.org/investigations/tobacco/> (accessed Nov. 16, 2010).

‡ Mexican tax rates were not included in the model; it is not clear that they have a significant impact on cigarette smuggling from Mexico. Smuggling across the U.S.-Mexico border is an organized crime activity, with the smugglers skirting Mexican law as well. Moreover, the real tax difference between Mexican states and U.S. states fluctuates with the currency exchange rate, even if no tax change occurs on either side of the border.

* Pennsylvania did raise cigarette taxes by 25 cents per pack after the end of fiscal 2009, but New York raised them by 160 cents. The Pocono Record reports that since July 1, 2010, when New York's cigarette tax hike of \$1.60 per pack took place, New York's legal cigarette sales have plummeted. According to the Record, New York's July 2010 “tax stamp” sales (one stamp is sold per pack) stood at 28.7 million, down from 43.1 million in July 2009 — a 33 percent decline. New York's cigarette tax revenues in July 2010 were only \$6 million — 5 percent — more than they were in July 2009, despite the 58 percent tax increase. See Stephen Sacco, “New York Tax Gives Pennsylvania Smokin' Cigarette Sales,” Pocono Record, Aug. 17, 2010, <http://www.poconorecord.com/apps/pbcs.dll/article?AID=/20100817/NEWS02/8170323> (accessed Oct. 18, 2010). Pennsylvania's cigarette sales and cigarette tax receipts have increased dramatically: July 2010 cigarette tax revenues were 40.5 percent greater in July 2010 than in July 2009. See “Monthly Revenue Report: July 2010” (Pennsylvania Department of Revenue, 2010), 4, http://www.portal.state.pa.us/portal/server.pt/community/monthly_revenue_reports/14801 (accessed Oct. 18, 2010).

Graphic 7: Top Four States in Smuggling From Mexico and Top Five States in Smuggling to Canada by Percentage of Total State Cigarette Consumption (Legal and Illegal), 2009

State	Canada/Mexico Smuggling Rank	Smuggling Involving Canada/Mexico	Commercial Smuggling (Interstate)	Casual Smuggling (Interstate)	Total	Rank by Overall Net Smuggling Into State
TX	1	-24.13%	-8.76%	2.07%	-33.29%	6
NM	2	-23.57%	-5.72%	-4.12%	-37.15%	4
AZ	3	-18.94%	-8.56%	-9.81%	-51.84%	1
CA	4	-18.46%	-4.25%	-8.54%	-36.29%	5
MI	43	3.52%	-16.62%	-11.64%	-26.04%	10
WA	44	4.15%	-19.74%	-14.45%	-31.75%	7
ME	45	4.34%	-20.48%	2.59%	-11.94%	21
NY	46	4.87%	-28.46%	-19.87%	-47.53%	2
VT	47	5.15%	-24.22%	8.86%	-7.21%	25

Notes: Texas, New Mexico, Arizona and California were the only states calculated to have cigarette smuggling imports from Mexico. Estimates computed based on regression results presented in columns 3 and 4 of Graphic 12 (see the Appendix). The smuggling percentage is negative when the state is a net importer of smuggled cigarettes, and the percentage is positive when the state is a net exporter of smuggled cigarettes. The sum of commercial, casual and Canada/Mexico smuggling does not equal the totals presented in the final column due to the nonlinear nature of the model. North Carolina, Hawaii and Alaska are not included.

Our revised 2006 data study showed that only three states in the union — Maine, New York and Washington — had export rates to Canada exceeding 2 percent of the states' cigarette consumption, and the rates barely exceeded that 2 percent threshold. Our estimates for 2009 suggest the smallest nonzero export rate is just above 2 percent.

The higher smuggling estimates for 2009 are driven by increases in Canada's federal cigarette tax in 2008.²² In addition, the province of Prince Edward Island increased its cigarette tax in 2008 and 2009,²³ while Nova Scotia increased its cigarette tax in 2009.²⁴ The U.S.-Canada tax differential has been further heightened by the two countries' currency exchange rates, which have generally made the cost of American goods fall relative to the cost of Canadian goods in recent years.²⁵

Other sources estimate high cigarette smuggling rates into Canada. For instance, a 2008 report from GfK Research Dynamics authored for the National Study for the Canadian Tobacco Manufacturers' Council indicates that illegal cigarettes made up 32.7 percent of that nation's cigarette market share, up from 22 percent the year before.²⁶ The same 2008 report also argued that the illicit market for cigarettes was almost 49 percent in Ontario,²⁷ where more than one-third of all Canadians live.²⁸ Citing the Royal Canadian Mounted Police, the National Coalition Against Contraband Tobacco writes that 90 percent of the contraband cigarettes originate in the United States.²⁹

22 "Tax Rates across Canada" (Nova Scotia Department of Finance, 2010), <http://www.gov.ns.ca/finance/en/home/taxation/taxratesacross.aspx> (accessed Nov. 2, 2010).

23 Kimberley Tran, "Comparative Tax Rates (2007)" (Nova Scotia Finance, 2007), http://www.gov.ns.ca/finance/site-finance/media/finance/comparative_2007.pdf (accessed Dec. 3, 2010); "Comparative Tax Rates for the 2008 Tax Year" (Nova Scotia Finance, 2008), http://www.gov.ns.ca/finance/site-finance/media/finance/comparative_2008.pdf (accessed Dec. 3, 2010); "Comparative Tax Rates for the 2009 Tax Year" (Nova Scotia Finance, 2009), <http://www.gov.ns.ca/finance/site-finance/media/finance/taxation/TaxRates2009.pdf> (accessed Dec. 3, 2010).

24 "Nova Scotia Tax Information: Bulletin S076" (Service Nova Scotia and Municipal Relations Program Management and Corporate Services Provincial Tax Commission, 2009), <http://www.gov.ns.ca/snsmr/pdf/ans-taxcomm-bulletin-S076.pdf> (accessed Dec. 7, 2010).

25 "USD/CAD (Usdcad=X)" (Yahoo! Finance) <http://yhoo.it/gojcyK> (accessed Dec. 14, 2010).

26 GfK Group, "Illegal Tobacco Sales: A Crisis for Canadians" (Canadian Tobacco Manufacturers' Council, 2008), 5, <http://www.stopcontrabandtobacco.ca/pdf/2008gFk.pdf> (accessed Oct. 20, 2010).

27 Ibid., 7.

28 "Indicators of Well-Being in Canada" (Human Resources and Skills Development Canada, 2010), <http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=34> (accessed Nov. 23, 2010).

29 "Contraband Tobacco in Canada: Time for Action" (National Coalition Against Contraband Tobacco, 2009), 8, <http://www.stopcontrabandtobacco.ca/pdf/timeforaction2009.pdf> (accessed Dec. 7, 2010).

Trends in Estimated Smuggling Rates

Our estimates suggest that cigarette smuggling rates across the country have wafted downward a bit. Consider Michigan as an example. In our January 2009 revision of 2006 state smuggling rates, we estimated Michigan's total net smuggling rate at just over 31 percent of Michigan's total cigarette consumption. That is, for every 10 cigarettes smoked, three appear to have been contraband. In contrast, our current estimate for Michigan's net smuggling rate in 2009 is just 26 percent.

There may be several reasons for this decline. First, in 2009, North Carolina raised its cigarette taxes by 10 cents per pack. Because North Carolina is our prototypical source state (as it is in much of the economic literature on cigarette smuggling), this tax hike reduced the interstate tax differentials, and our estimates of commercial — and thus total — smuggling rates declined.

Second, as we mentioned above, Canada increased its taxes in 2008 and thus spurred outbound trafficking from states such as Michigan. According to our calculations, Michigan exports to Canada between 2006 and 2009 increased by nearly 1.7 percentage points, to 3.5 percent. Such smuggling exports would lower the total net inbound smuggling estimates for Michigan, as it did other states exporting to Canada.

Overall Smuggling Volumes for 2009

So far, we have examined cigarette smuggling in terms of smuggling rates — i.e., smuggling as a percentage of a state's consumption of cigarettes, both legal and illegal. But a state with a relatively high smuggling rate may not experience a large volume of smuggled cigarettes relative to other states if the state does not consume many cigarettes in the first place. Similarly, a state with a relatively low smuggling rate may experience relatively large smuggling volumes if the volume of cigarettes it consumes is high.

For instance, as shown in Graphic 8, Michigan has the 10th highest smuggling rate in the nation, but it is fifth highest in sheer volume of illegal contraband flowing into the state. Michigan is a relatively populous state, and its residents consume a large volume of cigarettes.

The same goes for other big states. California has the fifth highest cigarette smuggling import rate in the nation, according to our model, but it is first in estimated contraband volume, with more than 451 million packs of cigarettes smuggled into the state. Even more striking is Florida: It has only the 29th highest smuggling import rate in the nation (just 6.36 percent of state consumption), but it is 9th in estimated overall smuggling volume, with our calculations suggesting that nearly 70 million packs were brought illegally into the state in 2009. Similar differences occur for Ohio, which is 23rd in smuggling import rate, but 11th in

Graphic 8: Estimated Smuggling Volumes and Smuggling Rates, 2009

State	Total Smuggling Volume in Packs	Rank by Smuggling Volume	Total Smuggling as a Percentage of State Consumption	Rank by Smuggling Percentage
CA	-451,476,921	1	-36.29%	5
TX	-377,512,228	2	-33.29%	6
NY	-339,636,312	3	-47.53%	2
AZ	-149,730,490	4	-51.84%	1
MI	-135,716,412	5	-26.04%	10
NJ	-87,020,344	6	-28.61%	8
WI	-80,191,715	7	-25.72%	11
WA	-71,336,873	8	-31.75%	7
FL	-69,341,757	9	-6.36%	29
MD	-55,303,065	10	-26.43%	9
OH	-54,829,326	11	-9.16%	23
MN	-52,022,348	12	-21.05%	14
OR	-34,139,212	13	-19.28%	16
CO	-33,841,920	14	-16.23%	17
IA	-30,832,030	15	-19.98%	15
NM	-28,986,907	16	-37.15%	4
IL	-27,788,659	17	-5.94%	30
PA	-26,625,233	18	-4.38%	31
RI	-25,174,107	19	-40.53%	3
LA	-20,095,570	20	-6.74%	28
MS	-19,740,376	21	-9.17%	22
KS	-18,869,157	22	-15.38%	18
CT	-17,186,328	23	-12.14%	20
OK	-16,138,613	24	-6.87%	26
AR	-15,350,054	25	-8.84%	24
MT	-11,568,412	26	-23.52%	13
SD	-9,472,006	27	-23.72%	12
UT	-8,675,939	28	-14.10%	19
ME	-7,422,254	29	-11.94%	21
NE	-5,878,019	30	-6.81%	27
MA	-3,143,809	31	-1.73%	32
VT	-1,883,138	32	-7.21%	25
ND	-581,505	33	-1.56%	33
TN	848,100	34	0.23%	34
ID	2,973,335	35	5.30%	39
WY	2,997,580	36	10.47%	43
IN	3,316,357	37	0.88%	35
GA	6,735,865	38	1.61%	36
NV	7,707,245	39	7.92%	41
AL	7,939,902	40	3.02%	37
NH	8,727,104	41	7.79%	40
KY	12,830,808	42	3.17%	38
DE	18,495,135	43	28.55%	46
WV	19,056,332	44	12.97%	45
SC	24,916,468	45	9.20%	42
MO	46,238,086	46	11.66%	44
VA	159,622,053	47	56.33%	47

Notes: Estimates computed based on regression results presented in columns 3 and 4 of Graphic 12 (see the Appendix). The smuggling percentage is negative when the state is a net importer of smuggled cigarettes, and the percentage is positive when the state is a net exporter of smuggled cigarettes. The sum of commercial, casual and Canada/Mexico smuggling does not equal the totals presented in the final column due to the nonlinear nature of the model. North Carolina, Hawaii and Alaska are not included.

smuggling import volume; Illinois, which is 30th in rate, but 17th in volume; and Pennsylvania, which is 31st in rate, but 18th in volume.

Conversely, tiny Rhode Island, with a population exceeding just 1 million, has the third highest overall smuggling import rate in the nation, but is 19th among the states in estimated smuggling import volume. Similar disparities occur for New Mexico, which is fourth in estimated smuggling import rate, but 16th in estimated smuggling import volume; Montana, which is 13th in smuggling rate, but 26th in smuggling volume; and South Dakota, which is 12th in rate, but 27th in volume.

Unintended Consequences of Cigarette Tax Increases

We do not doubt that most lawmakers who push for cigarette tax hikes sincerely believe it is the best way to solve a particular policy problem. Some may be concerned about public health and wish to dissuade smokers from smoking. Others may want to balance a state budget without spending cuts.

But the effects of well-intentioned cigarette excise taxes are not completely positive. Negative consequences include smuggling, “channeling,” counterfeiting and violence. We explored these topics in detail in our earlier study,* but we discuss them again briefly below.

The Realities of Cigarette Smuggling

When states and nations maintain markedly different cigarette excise taxes, smuggling ensues. Cigarette packs are light, popular and easily concealed, so they make ideal contraband for those willing to break the law.[†]

Unfortunately, many observers confuse declines in cigarette sales following a tax hike with smokers “breaking the habit.” That is, they often assume that if legal cigarette sales drop by 20 percent after a tax hike, it is a direct function of people no longer smoking.

For example, on July 1, 2009, a \$1.00 per-pack cigarette tax hike took effect in Florida. By November 2009, sales had declined by 20 percent, with some counties witnessing sales declines of 50 percent.³⁰ From July 1, 2009, to July 1, 2010, Florida’s legal cigarette sales were down 31.2 percent, according to a spokesperson for the Florida Department of Business and Professional Regulation.³¹ Florida state Rep. Jim Waldman, who supported the tax hike, was quoted as saying: “It’s working exactly the way it was designed to work. People are quitting. If I could, I’d raise it another dollar.”³²

While it is technically accurate to say people are quitting, it is probably misleading. A 2005 study by economist Mark Stehr indicated that “up to 85% of the tax paid

* For more on all of these topics, see Michael LaFaive, Patrick Fleenor and Todd Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 37, 49, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

† Smuggling has a long pedigree in the United States. America’s founding involved at least one alleged smuggler: John Hancock. Evidence also indicates that during the Civil War, the Confederacy smuggled painkillers from Europe inside of dolls. Steve Szkotak, “Confederates Used Dolls for Drug Smuggling,” Cape Cod Times (Associated Press), October 28, 2010, <http://www.capecodonline.com/apps/pbcs.dll/article?AID=/20101028/NEWS11/101029741/-1/rss04> (accessed Nov. 17, 2010). During Prohibition, Americans acquired liquor by smuggling booze in everything from hollowed-out watermelons to gas tanks outfitted to hold both gasoline and whiskey. Michael LaFaive, Patrick Fleenor and Todd Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 87, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

30 Josh Hafenbrack, “Cigarette Sales Plunge since Florida’s Tax Increase,” TCPalm.com, Nov. 16, 2009, <http://www.tcpalm.com/news/2009/nov/16/cigarette-sales-plunge-floridas-tax-increase/> (accessed Oct. 20, 2010).

31 Alexis Antonacci Lambert, e-mail correspondence with Michael LaFaive, Oct. 19, 2010.

32 Hafenbrack, “Cigarette Sales Plunge since Florida’s Tax Increase,” TCPalm.com, Nov. 16, 2009, <http://www.tcpalm.com/news/2009/nov/16/cigarette-sales-plunge-floridas-tax-increase/> (accessed Oct. 20, 2010).

sales response”³³ to a cigarette tax hike is due to tax avoidance, not quitting.* When Florida was first considering \$1.00 per-pack tax hike in 2009, we estimated in an unpublished calculation that legal sales of cigarettes in Florida would decline by 19 percent as a direct result of smuggling.

There is ample empirical evidence that such smuggling occurs. In our 2008 study, we reviewed some of this evidence.³⁴ Since then, more has emerged.

For example, in March 2010, the U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives reported that prior to 2003, the bureau averaged only 40 new tobacco “diversion” (smuggling) cases each year. Since 2003, that annual average has leapt to 131.³⁵

In the state of Michigan, there are currently two significant federal cases being prepared against seven individuals for their alleged involvement in massive cigarette smuggling. The complaints were recently dismissed, but only to allow the government more time to prepare indictments.³⁶ Both cases involve individuals located near a Michigan Indian community and cigarette shipments from and to low-tax Kentucky.

In the first case, the affidavit filed in support of arrest warrants for the suspects alleges that between October 2008 and July 2009, they acquired more than 40 million untaxed cigarettes from an undercover ATF agent.³⁷ The cigarettes were allegedly purchased with \$4.3 million in cash, cashier’s checks and money wired to the account of the undercover agent. Remarkably, these men not only may have transported untaxed cigarettes into Michigan (and had them mailed using the U.S. Postal Service); they also allegedly exported a large portion of untaxed cigarettes to Louisville, Ky.³⁸

In the second case, in an affidavit filed in support of the arrest warrants, five individuals were alleged to have purchased more than 16 million untaxed cigarettes for approximately \$1.8 million between July 2007 and July 2009. The cigarettes were shipped to Michigan, Nevada and California. According to the affidavit, the orders shipped to all three states were “brokered” by a man from Baraga, Mich., and the checks used to pay for the cigarettes were allegedly drawn from Upper Peninsula businesses, including an outfitter, a pizza shop and a tobacconist.³⁹

* Other studies have produced similar conclusions. In 1995, R. Morris Coats argued that 80 percent of the sales response to cigarette tax hikes can be explained by cross-border shopping. Coats, “A Note on Estimating Cross-Border Effects of State Cigarette Taxes,” *National Tax Journal* 48, no. 4 (1995): 573. In a 2007 study, economist Joel Slemrod of the University of Michigan referenced Coats’ work, but argued that this figure would be smaller if Coats took into consideration “enforcement regimes” that raise the cost of cross-border smuggling. Joel Slemrod, “Are Tax Elasticities System-Dependent? Evidence from Michigan Cigarette Tax Policy” (2007): 5.

33 Stehr, “Cigarette Tax Avoidance and Evasion,” *Journal of Health Economics* 24 (2005).

34 LaFaive, Fleenor, and Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 22-65, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

35 “Fact Sheet: ATF Tobacco Diversion” (Bureau of Alcohol, Tobacco, Firearms and Explosives, 2010), 2, <http://www.atf.gov/publications/factsheets/factsheet-tobacco-diversion.html> (accessed Nov. 2, 2010).

36 Susan Gillooly, e-mail correspondence with Michael LaFaive, Nov. 5, 2010.

37 John Franklin, “Affidavit of John Franklin in Support of Criminal Complaint Against [Two Individuals; Names Redacted]” (testimony before the United States District Court for the Western District of Michigan, Aug. 4, 2009).

38 Ibid.

39 John Franklin, “Affidavit of John Franklin in Support of Criminal Complaint Against [Five Individuals; Names Redacted]” (testimony before the United States District Court for the Western District of Michigan, Aug. 4, 2009).

Channeling to Other Tobacco Products

Tax avoidance involves more than just casual and commercial smuggling; it also includes “channeling” to other forms of tobacco, such as chewing tobacco and “roll your own” cigarettes. A study by Harvard University researchers published in the June 11, 2008, *Journal of the American Medical Association* found that from 2000 to 2007, 30 percent of the decline in legal sales of cigarettes in the United States was offset by the acquisition of other tobacco products.⁴⁰ These products were small cigars, moist snuff and loose tobacco, which can be used to “roll your own.” The Harvard researchers measured the increase in sales of such products and found that it was equivalent in nicotine to 1.1 billion packs of cigarettes, partly counterbalancing the approximately 3.7 billion-pack decline in legal cigarette sales during the period.⁴¹

Other tobacco products are a natural alternative for cigarette smokers, because the taxes are typically lower. Such products can also be smuggled, both casually and commercially. In our 2008 study, we noted that officials in the United Kingdom estimated in 2007 that 50 percent of hand-rolled tobacco used in the U.K. is smuggled.⁴²

Moreover, entrepreneurs have begun providing access to “roll-your-own” machines to help customers avoid excise taxes by purchasing loose tobacco. A page on the U.S. Treasury Department’s website reports that such machines can turn out 200 cigarettes in as little as eight minutes.⁴³ The RYO (Roll Your Own) Machine Rental LLC out of Ohio reports on its website that RYO cigarettes can cost as little as one-third the price of “pre-manufactured” cigarettes.⁴⁴ Many smokers roll cigarettes using pipe tobacco, which faces a dramatically lower federal excise tax.⁴⁵

Counterfeiting

Some contraband cigarette traffickers have taken to manufacturing counterfeits of popular brands, such as Marlboro and Camel. We wrote about this extensively in our 2008 study, and since that time, there have been major investigations, indictments and convictions of people trafficking counterfeit brands.

In July 2009, for instance, 12 million counterfeit cigarettes were seized by the ATF in Virginia alone.⁴⁶ In October 2010, the federal government secured a conviction in a Southern California case involving a conspiracy to smuggle counterfeit cigarettes, smuggled cigarettes, drugs and shoulder-fired missiles.⁴⁷ According to an FBI press release, this case and related work in New Jersey led to indictments of 87 people on smuggling charges.⁴⁸

In November 2009, the *British Journal of Criminology* published the research paper “The Dragon Breathes Smoke: Cigarette Counterfeiting in the People’s Republic of China.” The authors report that from 2002 through 2008, nearly

40 “Decline in Cigarette Smoking in U.S. Significantly Offset by Increase in Use of Cigars, Snuff, Roll-Your-Own and Other Tobacco Products” (Harvard School of Public Health, 2008), 2629, <http://jama.ama-assn.org/content/299/22/2629.full.pdf+html> (accessed Dec. 13, 2010).

41 Ibid.

42 “Departmental Report Integrating and Growing Stronger” (HM Revenue and Customs, 2007), 39, <http://bit.ly/hVWdAE> (accessed Sept. 20, 2008).

43 “TTB Ruling 2010-4: Cigarette-Making Machines in Retail Establishments” (U.S. Alcohol and Tobacco Tax and Trade Bureau, 2010), <http://www.ttb.gov/rulings/2010-4rule.pdf> (accessed Oct. 21, 2010).

44 “Filling a Need: Profiting with RYO” (RYO Machine Rental, LLC, 2010), <http://www.ryofillingstation.com/about.php> (accessed Nov. 4, 2010).

45 “TTB Ruling 2010-4: Cigarette-Making Machines in Retail Establishments” (U.S. Alcohol and Tobacco Tax and Trade Bureau, 2010), 2, <http://www.ttb.gov/rulings/2010-4rule.pdf> (accessed Oct. 21, 2010).

46 Freeman Klopott, “ATF Seizes 12 Million Counterfeit Marlboro Cigarettes Made in China,” *The Washington Examiner*, July 14, 2009, <http://www.washingtonexaminer.com/local/Feds-ATF-makes-largest-counterfeit-cigarette-seizure-in-area-history.html> (accessed Nov. 4, 2010).

47 “Southern California Man Faces at Least 25 Years in Prison for Convictions in Smuggling Schemes, Including Plot to Bring Surface-to-Air Missiles into United States” (United States Attorney’s Office, Central District of California, 2010), <http://losangeles.fbi.gov/dojpressrel/pressrel10/la100610.htm> (accessed Nov. 2, 2010).

48 Ibid.

1.5 million “cases of cigarette counterfeiting became known to the Chinese authorities.”⁴⁹ During this time, Chinese officials discovered more than 22,200 cigarette production areas and 8,800 machines for rolling counterfeit cigarettes. More than 30,800 people were arrested, though only about one-third were sentenced. The authors note that these are just the cases known to the authorities.⁵⁰

International smuggling is so extensive that some smugglers have established their own brand: “Jin Ling,” the only one known to have been created for the sole purpose of smuggling. It is typically produced in China, Russia or Russia’s former satellites.⁵¹ The October 2010 pictures featured in Graphic 9 show Jin Ling cigarettes shipped from China and encased in cement barriers as part of a smuggling operation to England.*,⁵²

Graphic 9: Jin Ling Cigarettes Smuggled in Concrete Barriers



Source: ukhomeoffice photostream (flickr), “Cigarettes hidden in a concrete block,” www.flickr.com/photos/49956354@N04/5135789331/in/photostream/, “Concrete concealed cigarettes,” www.flickr.com/photos/49956354@N04/5135789323/in/photostream/.

Illegal cigarettes may be adulterated. In our 2008 study, we mentioned that counterfeit smokes often used sawdust as a filler.⁵³ The study “The Dragon Breathes Smoke,” discussed above, indicated that counterfeits may also contain rotten tobacco, sulfur, carbamide and “heavy metals to a greater extent than cigarettes produced by authorized manufacturers.”⁵⁴

Violence

The history of cigarette smuggling is also a history of violence, threatened or actual, against people and property.[†] In our previous work, we detailed numerous examples. More recently, in March 2010, a man from Virginia admitted guilt in a murder-for-hire deal with a hit man in a case involving smuggled cigarettes.⁵⁵ In November 2008, an elderly couple from New York was killed just inside the Canadian border after a suspected cigarette smuggler plowed into their car while fleeing police.⁵⁶

* For more information on the Jin Ling phenomena see Shleynov et al., “Made to Be Smuggled” (Center for Public Integrity, 2008), <http://www.publicintegrity.org/investigations/tobacco/articles/entry/763/> (accessed Nov. 16, 2010).

† Tax Foundation economist Patrick Fleenor has written that in 1967, the chairman of a smuggling investigative body said that legitimate tobacco-related workers were “confronted almost daily with the risk and dangers of personal violence which are now inherent in their industry.” Patrick Fleenor, “High Cigarette Taxes Stoke Bootlegging, Violence” (Tax Foundation, 2010), <http://www.taxfoundation.org/news/show/26132.html> (accessed Dec. 13, 2010).

49 Anqi Shen, Georgios A. Antonopoulos, and Klaus Von Lampe, “The Dragon Breathes Smoke: Cigarette Counterfeiting in the People’s Republic of China,” *The British Journal of Criminology* 50, no. 2 (2010): 243.

50 Ibid.

51 Roman Shleynov et al., “Made to Be Smuggled” (Center for Public Integrity, 2008), <http://www.publicintegrity.org/investigations/tobacco/articles/entry/763/> (accessed Nov. 16, 2010).

52 “File:Cigarettes Hidden in a Concrete Block Ba1.Jpg” (Wikimedia Commons, 2010), <http://bit.ly/i14wbx> (accessed Dec. 13, 2010).

53 LaFaive, Fleenor, and Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 8, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

54 Shen, Antonopoulos and Lampe, “The Dragon Breathes Smoke: Cigarette Counterfeiting in the People’s Republic of China,” *The British Journal of Criminology* 50, no. 2 (2010): 245.

55 Fleenor, “High Cigarette Taxes Stoke Bootlegging, Violence” (Tax Foundation, 2010), <http://www.taxfoundation.org/news/show/26132.html> (accessed Dec. 13, 2010).

56 “Suspected Cigarette Smuggler Kills Couple in Crash,” *The Ottawa Citizen*, Nov. 16, 2008, <http://bit.ly/dXKxJV> (accessed Nov. 4, 2010).

One cigarette wholesaler in Detroit — Martin & Snyder Product Sales — has had two of its trucks hijacked. One of the company’s “cash and carry” customers was shot three times as the merchandise he had just purchased — including cigarettes — was stolen from him, along with his car. While the customer survived, he lost a kidney in the shooting.⁵⁷

Details recently became available in an older Michigan case we have mentioned before.⁵⁸ On Oct. 13, 2004, 107 cases of Philip Morris cigarettes were stolen from a truck operated by Columbian Distribution Services — a Grand Rapids-based company — while it was at a terminal of Eby-Brown Company in the city of Ypsilanti, Mich. The cigarettes were valued at the time at \$173,340.⁵⁹ The robbery apparently involved a five-man team, but two have never been apprehended, according to an attorney at the U.S. Department of Justice.⁶⁰ Court documents state that the driver-victim in this incident was “struck in [sic] the head with a heavy object, bound, blindfolded, robbed and left sitting on the ground as the truck was unloaded.”⁶¹

Remarkably, one of the three defendants in this case had been convicted of committing a “near[ly] identical crime, just a few years prior in time.”⁶² In that 1997 crime, “the victim was wrestled to the ground, bound and gag[g]ed”⁶³ and told “we will get you” should he talk.⁶⁴ According to the government’s sentencing memorandum, the defendant had also stolen cigarettes from Eby-Brown while working there as an employee. Ironically, he worked in the company’s stamping department, where tax stamps are placed on cigarettes to help thwart smuggling.

While serving time in prison for the 1997 robbery, the defendant had shared a cell with an individual who was then doing time for bank fraud, and who would later assist in the commission of the Eby-Brown robbery.⁶⁵ The third of the perpetrators had a lengthy police record of prior offenses, including assault, burglary and receiving stolen property.⁶⁶

State Cigarette Tax Hike Proposals

Whatever the unintended consequences, a number of states have been considering cigarette tax hikes. Since 2009, for instance, new cigarette tax hikes have been proposed in Michigan,⁶⁷ Ohio,⁶⁸ Illinois⁶⁹ and California.⁷⁰ We have generated forecasts of the effects if these were adopted.

⁵⁷ George Daiza co-owner of Martin & Snyder Product Sales, interview correspondence with Michael LaFaive, Feb. 12, 2008.

⁵⁸ LaFaive, Fleenor and Nesbit, “Cigarette Taxes and Smuggling” (Mackinac Center for Public Policy, 2008), 46, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

⁵⁹ Barbara McQuade, “Government Sentencing Memorandum, *United States of America v. Lee Edward Newberry*” (testimony before the United States District Court of Eastern Michigan, February 2010), 2.

⁶⁰ Susan Gillooly, e-mail correspondence with Michael LaFaive, Nov. 12, 2010.

⁶¹ Barbara McQuade, “Government Sentencing Memorandum, *United States of America v. Lee Edward Newberry*” (testimony before the United States District Court of Eastern Michigan, February 2010), 5.

⁶² *Ibid.*

⁶³ *Ibid.*, 6.

⁶⁴ *Ibid.*

⁶⁵ Barbara McQuade, “Government Sentencing Memorandum, *United States of America v. Edward Alford*” (testimony before the United States District Court of Eastern Michigan, March 29, 2010).

⁶⁶ Terrence Berg, “Government Sentencing Memorandum, *United States of America v. Lamar Larry*” (testimony before the United States District Court of Eastern Michigan, November 2009).

⁶⁷ Monica Scott, “Proposed Increase of Michigan Beer, Cigarette Taxes to Boost State Revenue Draws Fire from Industry, Lawmakers,” *The Grand Rapids Press*, Aug. 3, 2009, <http://bit.ly/17jOAp> (accessed Nov. 4, 2010).

⁶⁸ Brad Bauer, “Taxing Tobacco: Ohio Lawmakers Consider Hike in Statewide Rates,” *The Marietta Times*, Sept. 16, 2010, <http://bit.ly/bg5pzv> (accessed Nov. 2, 2010).

⁶⁹ *Illinois Senate Bill 44 Engrossed*, <http://bit.ly/fzGUf6> (accessed Nov. 2, 2010).

⁷⁰ “Qualified Statewide Ballot Measures” (California Secretary of State, 2010), <http://www.sos.ca.gov/elections/ballot-measures/qualified-ballot-measures.htm> (accessed Nov. 12, 2010).

Michigan

The Great Lakes State currently levies a cigarette tax of \$2.00 per pack. Gov. Jennifer Granholm has proposed a 25-cent per-pack cigarette tax increase.⁷¹ We estimate that this hike would raise Michigan's overall smuggling rate to 28.3 percent of the state's total consumption and the commercial smuggling rate to 18.8 percent — up from 26.0 percent and 16.6 percent, respectively. Legal sales would drop 3.3 percent, but revenue to the state is estimated to increase by approximately 9 percent.

Ohio

Ohio currently levies a cigarette tax of \$1.25 per pack. The proposed tax hike of \$1.25 per pack, to \$2.50 per pack, is the largest of the four states we consider here.⁷² Should the \$1.25 tax proposal be adopted, the Buckeye State would see its total smuggling rate rise to 23.3 percent of the state's consumption, up from a relatively modest 9.2 percent. This estimated smuggling rate increase would no doubt be fueled by the proximity of Ohio to states like Kentucky, which has a tax of only 60 cents⁷³ per pack.* Commercial smuggling, however, would make up the vast majority of the total smuggling that occurred in the state.

Illinois

There have been a couple of proposals to hike the Illinois state cigarette excise tax in recent years, including Senate Bill 44, which passed the Illinois Senate in 2010.⁷⁴ This proposal would have hiked taxes by \$1.00 per pack, creating a total state excise tax burden of \$1.98 per pack. We project that this would have increased total smuggling in the state to 26.3 percent of total state cigarette consumption, up from just 5.9 percent in 2009. As with Michigan and Ohio, the majority of Illinois' smuggling would be commercial, making up an estimated 24.3 percent of total consumption.

Such large smuggling increases might seem unlikely, but in a 2010 paper titled "The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Packs in Chicago," David Merriman calculated that 75 percent of the discarded packs of cigarettes he found in Chicago lacked a city tax stamp. More of the littered packs — 29 percent — came from Indiana than from Chicago itself, perhaps because Gary, Ind., is just 25 miles from downtown Chicago.⁷⁵

* For more on smuggling between Kentucky and Ohio see Richard Vedder, "Bordering on Chaos: Fiscal Federalism and Excise Taxes," in *Taxing Choice: The Predatory Politics of Fiscal Discrimination*, ed. William F. Shughart II (Oakland, Calif.: The Independent Institute, 1997), 271.

71 Scott, "Proposed Increase of Michigan Beer, Cigarette Taxes to Boost State Revenue Draws Fire from Industry, Lawmakers," *The Grand Rapids Press*, Aug. 3, 2009, http://www.mlive.com/news/grand-rapids/index.ssf/2009/08/proposed_increase_of_michigan.html (accessed Nov. 4, 2010).

72 Bauer, "Taxing Tobacco: Ohio Lawmakers Consider Hike in Statewide Rates," *The Marietta Times*, Sept. 16, 2010, <http://bit.ly/bg5pzv> (accessed Nov. 2, 2010).

73 "The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009" (Arlington, Va.: Orzechowski and Walker, 2009), 9.

74 *Illinois Senate Bill 44 Engrossed*, <http://www.ilga.gov/legislation/fulltext.asp?DocName=&SessionId=76&GA=96&DocTypeId=SB&DocNum=44&GAID=10&LegID=&SpecSess=&Session=> (accessed Nov. 2, 2010).

75 Merriman, "The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Packs in Chicago," *American Economic Journal: Economic Policy* 2, no. 2 (2010): 69.

California

California has long been a major smuggling state, largely due to its many ports and its border with Mexico.* Voters in California will decide in February 2011 whether to hike cigarette taxes by \$1.00 per pack, for a total tax of \$1.87 per pack. Should this proposal be approved, we estimate an increase in the state's smuggling rate to 51.9 percent of the state's total cigarette consumption, up from 36.3 percent. Most of the smuggled cigarettes would originate in Mexico. Based on our 2009 rankings, this would make California America's biggest smuggling state in both smuggling rate and volume.†

Policy Recommendations

Lawmakers consistently advance cigarette excise taxes in order to raise revenue, improve health or both. Few seem aware that the higher tax is unlikely to raise the projected revenue or cause smokers to abandon cigarettes in droves.

With high cigarette excise taxes, states like Michigan, California, New York and New Jersey have already created massive illegal cigarette markets. Indeed, state tobacco taxes have provided profits for organized crime. There are real societal costs to smuggling and its unintended consequences: violence against innocent victims, strain on police and the legal system, theft, property damage and use of unfiltered legal cigarettes and adulterated counterfeit tobacco products.

With extremely high rates of excise taxation, it is even possible that a net decline in cigarette tax revenue could occur, thwarting lawmakers' aims. This appears to have happened in New Jersey. State cigarette tax revenues had been increasing for several years prior to a state cigarette tax increase in July 2006 (the beginning of the 2007 fiscal year), when the tax was hiked from 240 cents per pack to 257.5 cents per pack.⁷⁶ This increase corresponded to a decline in gross state cigarette tax revenues, from \$788.7 million in fiscal 2006 to \$766.5 million in fiscal 2007; \$764.7 million in fiscal 2008; and \$728.1 million in fiscal 2009.⁷⁷

Remarkably, New Jersey was not finished raising taxes. The state's 2010 fiscal year began in July 2009 with another cigarette tax hike, this one from 257.5 cents to 270 cents.⁷⁸ Revenue in the first full year of the tax hike did increase, but by less than one-half of 1 percent, to \$735 million — an amount that was still well below 2006 levels.⁷⁹

As states with high cigarette tax rates contemplate further increases, they should consider the negative consequences. They should also consider rolling back excise taxes to thwart smuggling and other unintended harms. It may not be enough for high-tax states to do no more harm; some, like Michigan, should consider rolling back tobacco tax rates to levels similar to their neighboring states'.

* For a longer narrative on cigarette smuggling in California, see LaFaive, Fleenor and Nesbit, "Cigarette Taxes and Smuggling" (Mackinac Center for Public Policy, 2008), 58-65, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

† One caveat is necessary: In 2010, the state of New York hiked its taxes to \$4.35 per pack. This increase might lead to a higher smuggling rate than California's, even with California's proposed tax hike.

76 "The Tax Burden on Tobacco: Historical Compilation, Volume 44, 2009" (Arlington, Va.: Orzechowski and Walker, 2009), 9.

77 *Ibid.*, 310.

78 *Ibid.*, 10.

79 Paul Tyahla, Common Sense Institute of New Jersey, e-mail correspondence with Michael LaFaive, Nov. 9, 2010.

We used our model to estimate what would happen if Michigan cut its cigarette tax to 102.5 cents per pack, the average excise tax rate for Indiana, Ohio and Wisconsin. We estimate that while cigarette revenues would decline by 42 percent, or about \$324 million, Michigan's overall smuggling rate would fall from 26 percent of the state's total consumption to 16.3 percent — a decline of about 37 percent.*

Policymakers should also realize that cigarette taxes disproportionately target low-income people. In other words, they are regressive taxes. Economists Philip DeCicca, Donald S. Kenkel and Feng Liu report that their research shows cigarette excise tax avoidance actually increases with a person's income, suggesting that cigarette taxes may be even more regressive than they appear.⁸⁰

Lawmakers should also question whether tobacco revenue should be used to support general fund spending. Targeting a minority of the population for taxes to fund programs for the majority is bad public policy. It removes an important link between those who pay for and those who receive the benefits of government spending. Severing this link may only encourage the majority to happily overtax weaker constituencies and ignore the cost of the programs they use. Indeed, if lawmakers are serious about curbing the deleterious health consequences of smoking, they should consider dedicating such revenue to that purpose alone.

Ultimately, lawmakers must consider and respect the value of individual freedom when setting tax policies, including cigarette excise tax rates. People who purchase legal products from licensed retailers are adults. They are considered able — and free — to determine their own destinies. That includes the decision to use tobacco products or not. True, taxation is not prohibition, but as Supreme Court Chief Justice John Marshall once wrote, "That the power to tax involves the power to destroy ... [is] not to be denied."⁸¹

Lawmakers should also consider the revolutionary proposition the Founders advanced when they wrote of an "unalienable right" to "life, liberty and the pursuit of happiness." Last August, writer Vincent DeMarco of the Maryland Citizens Health Initiative wrote in the *Baltimore Sun* that Maryland should hike its alcohol and tobacco taxes to — among other justifications — save lives.⁸² On the popular blog site *Cafe Hayek*, George Mason University economist Don Boudreaux offered a stinging rebuke, writing:

The lives of individuals are the property neither of any government nor of officious "public interest" groups such as the one that Mr. DeMarco leads. The life of each individual Marylander belongs to that individual. If he or she chooses to endure the higher statistical chance of dying sooner rather than later in order to enjoy smoking, drinking, hang-gliding, or gulping down gasoline[,] it is no business of the state or of the likes of Mr. DeMarco. ...⁸³

* While the estimated impact of both casual and commercial smuggling is found to be statistically significant, estimated smuggling to Canada is not statistically significant.

80 DeCicca, Kenkel and Liu, "Excise Tax Avoidance: The Case of State Cigarette Taxes," *NBER Working Paper Series* (2010): 32.

81 "U.S. Supreme Court Center: *McCulloch v. Maryland*, 17 U.S. 316 (1819)" (Justia.Com), <http://supreme.justia.com/us/17/316/case.html> (accessed Dec. 1, 2010).

82 Vincent DeMarco, "Maryland Sin Taxes Save Lives," *The Baltimore Sun*, Aug. 19, 2010, http://articles.baltimoresun.com/2010-08-19/news/bs-ed-demarco-letter-20100819_1_alcohol-tax-tobacco-tax-cigarette-tax (accessed Nov. 8, 2010).

83 Don Boudreaux, "Live Free or Die" (*Cafe Hayek*, 2010), <http://cafehayek.com/2010/08/live-free-or-die.html/print/> (accessed Nov. 8, 2010).

We hope lawmakers are careful about imposing excise taxes in the name of living in a tobacco-free world. As we have written before, freedom matters too.

Appendix

In this appendix, we discuss the empirical models and results used to produce the casual and commercial smuggling estimates presented in Graphic 2 of this report. The results of this study build upon the existing literature, in which much support appears for the existence of substantial tax-induced smuggling, both casual and commercial.*

Much of this literature employs empirical models of representative consumer demand, including such variables as cigarette price, tourism, income, race, religious affiliation and other demographic variables, in addition to the primary variables of interest: tax (or price) differentials; American Indian and military population; and distance from North Carolina.

The empirical method chosen here does not estimate consumer demand; rather, it follows the two-stage method proposed by LaFaive, Fleenor and Nesbit in 2008. We first estimate in-state consumption and then use the residual from that regression as a measure of smuggling. We then take that measure of smuggling (unexplained state sales) and regress it as a function of tax differentials and other commonly employed variables used to describe casual and commercial smuggling.

What follows is a brief description of the estimation procedure and a discussion of the results. A more thorough description of the empirical model can be found in Appendix A of LaFaive, Fleenor and Nesbit's 2008 study.⁸⁴

Legal per-adult tax-paid cigarette sales (hereafter per-adult sales) can be defined as the sum of in-state consumption and net smuggling, as presented in Equation 1:

$$PCSales_{i,t} = Cons_{i,t} + NetSmug_{i,t} \quad (1)$$

where *PCSales* is per-adult cigarette sales,

Cons is in-state per-adult consumption,

NetSmug is the per-adult number of packs of cigarettes exported to residents of other states minus the number of packs imported by residents of the home state from other states or jurisdictions, including Indian reservations and military bases,

i is the state, and

t is the year.

* For examples of such research, see Michael D. LaFaive, Patrick Fleenor and Todd Nesbit, "Cigarette Taxes and Smuggling" (Mackinac Center for Public Policy, 2008), <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010); Michael F. Lovenheim, "How Far to the Border?: The Extent and Impact of Cross-Border Casual Cigarette Smuggling," *National Tax Journal* 61, no. 1 (2008); and Thursby and Thursby, "Interstate Cigarette Bootlegging: Extent, Revenue Losses, and Effects of Federal Intervention," *National Tax Journal* 53, no. 1 (2000).

84 LaFaive, Fleenor and Nesbit, "Cigarette Taxes and Smuggling" (Mackinac Center for Public Policy, 2008), <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

Our first-stage regression equates to a naïve version of Equation 1, in that we do not control for any smuggling. Instead, we include only measures of in-state consumption on the right-hand side of the equation. If the smuggling of cigarettes is not prominent, then sales within the state will be approximately equal to in-state consumption. However, if smuggling is a prominent feature of the cigarette market, such a naïve model will fail to explain a large percentage of the variation in per-adult sales, resulting in residuals of large magnitude.

The sign and magnitude of the residuals from the estimation of the naïve model are of particular interest to us. Specifically, for low-tax states, the naïve model should systematically underpredict actual sales, as consumers from other states travel across state and international borders to purchase cigarettes there. Thus, actual sales in the low-tax state should exceed the consumption within the state, resulting in a positive residual. Similarly, the naïve model should systematically overpredict actual sales for high-tax states, resulting in a negative residual, as in-state residents choose to purchase cigarettes from nearby lower-tax states, Indian reservations, military bases or illegal markets.

In order to estimate our naïve model of per-adult tax-paid cigarette sales, in-state per-adult consumption is characterized by Equation 2:

$$Cons_{i,t} = Smoke_{i,t} * Intensity_{i,t} * R_{i,t} \quad (2)$$

where *Smoke* is the percent of the state's adult population who are smokers (known as "smoking prevalence"),

Intensity is the average number of packs consumed during a year by the state's smokers, and

R is a parameter between zero and one allowing for the underreporting of smoking prevalence.

State-by-state data on smoking prevalence is available from the Centers for Disease Control and Prevention through its Behavioral Risk Factor Surveillance System. Unfortunately, state-by-state data on smoking intensity is not readily available. LaFaive, Fleenor and Nesbit observe that smoking intensity at the national level declined roughly linearly from 1995 to 2006 and assume that smoking intensity does not vary significantly across states, allowing for a linear trend to capture the variation in smoking intensity through time, as indicated in Equation 3:^{*,85}

* Some evidence suggests a systematic underreporting of cigarette consumption in surveys such as the BRFSS; however, any such bias is likely to impact smoking intensity figures, not smoking prevalence. See Kenneth E. Warner, "Possible Increases in the Underreporting of Cigarette Consumption," *Journal of the American Statistical Association* 73, no. 362 (1978).

85 LaFaive, Fleenor and Nesbit, "Cigarette Taxes and Smuggling" (Mackinac Center for Public Policy, 2008), 73-74, <http://www.mackinac.org/archives/2008/s2008-12.pdf> (accessed Dec. 10, 2010).

$$Cons_{i,t} = Smoke_{i,t} * f(Trend_t) \quad (3)$$

where $f(Trend_t)$ represents the above-described linear function of smoking intensity and its systemic underreporting.

We estimated our naïve model of per-adult sales using state-level data for the U.S. continental states for the period 1990-2009. North Carolina is excluded from our sample because it is modeled as the primary source of commercially smuggled cigarettes in the second-stage regression.

Descriptive statistics and sources for all variables used in this study can be found in Graphic 10. All dollar amounts are represented in 2009 prices.

Graphic 11 presents the maximum likelihood estimates of our naïve model corrected for groupwise heteroskedasticity to allow for nonconstant variance across states. We present both linear (Columns 1 and 2) and log-linear (Columns 3 and 4) specifications for robustness, but the log-linear specification appears to more closely fit the data and hence is the preferred specification.

Per the results presented in the final two columns of Graphic 11, a 1 percentage point increase in the smoking prevalence rate results in a 5.8 percent increase in per-adult sales in the state. Furthermore, per-adult sales are shown to decrease by an average of 1.7 percent per year, which we attribute to the decline in smoking intensity over time.

Graphic 10: Descriptive Statistics and Sources of Data

	Mean	Std. Dev.	Minimum	Maximum	Source
Per-Adult Cigarette Sales [packs]	85.46	28.92	24.80	186.80	[1]
Smoking Prevalence [%]	22.29	3.41	9.30	32.60	[2]
Average Tax Rate Differential [cents]	-1.11	38.02	-139.37	179.31	[1,4]
Percent Border Population [%]	1.31	1.00	0.11	4.59	[3,4]
Canadian Border State Dummy * Tax [cents]	26.80	59.63	0.00	376.00	[1,4]
Mexican Border State Dummy * Tax [cents]	9.48	34.42	0.00	301.00	[1,4]
Indian Reservation Dummy * Tax [cents]	51.89	64.59	0.00	376.00	[1,4]
N.C. Tax Differential [cents]	50.97	46.64	-28.97	311.00	[1,4]

[1] Tax Burden on Tobacco, various years

[2] Behavioral Risk Factor Surveillance System Survey Data (BRFSS), various years

[3] U.S. Census Bureau, Intercensal County Population Estimates

[4] Computed

Note: All prices are represented in constant year 2009 dollars.

Graphic 11: Maximum Likelihood Estimation: State Per-Adult Cigarette Sales, 1990-2009

Dependent Variable:	Per-Adult Sales			LN(Per-Adult Sales)		
	[1]		[2]	[3]		[4]
	Coeff.		Std.Err.	Coeff.		Std.Err.
Smoking Prevalence [%]	3.8283	***	0.1093	0.0577	***	0.0014
Time Trend	-1.3983	***	0.0599	-0.0168	***	0.0008
Constant	10.3597	***	2.7318	3.2764	***	0.0362
Brusch-Pagen LM Statistic	2040.2235	***	1197.0100	***	[1,4]	
Chi-Squared Statistic	904.1531	***	657.9877	***	[1,4]	
Number of Observations	940			940		

Notes: Statistical significance of 1 percent, 5 percent and 10 percent are represented by ***, ** and *, respectively. Results are corrected for groupwise heteroskedasticity via the HREG command within NLOGIT 3.0. Regressions include state fixed effects; these are withheld here for space considerations, but are available upon request.

As mentioned above, it is not the coefficient estimates from the naïve model that interest us; rather, it is the model's residuals that are important. States with high tax rates relative to their neighbors and to North Carolina are expected to have residuals that are negative and large in magnitude, with predicted per-adult consumption exceeding the state's observed per-adult sales, suggesting that the state's consumers are obtaining their smokes in other jurisdictions or markets. Low-tax states are expected to have residuals that are positive and large in magnitude, with observed per-adult sales exceeding predicted per-adult consumption, suggesting that the states are net exporters of smuggled cigarettes.

We attribute most of the variation of the residual from the naïve model to the occurrence of "casual" and "commercial" smuggling. Casual smuggling can take the form of cross-border shopping between states; cross-border shopping either in Mexico or from Canada; or the purchase of untaxed cigarettes on military bases and Indian reservations by nonmilitary personnel and nontribe members. We include the weighted average tax differential — i.e., *home state tax rate – weighted average border state tax rate* — between the home state and the bordering states to account for tax-induced shopping across state lines. Similar to Coats' 1995 study, this study weights the average border tax rates by county border populations.⁸⁶

However, even with large average tax differentials, proportionally little casual smuggling is likely occur if few people live along the border relative to the state's population. Thus, we include the population living on either side of the border divided by the home state's total population (percent border population). This percentage can take on a value greater than one when the border population in surrounding states is sufficiently large, thus causing the border population to exceed the home state's total population. Finally, we include an interaction term between the average tax differential and percent border population.

⁸⁶ Coats, "A Note on Estimating Cross-Border Effects of State Cigarette Taxes," *National Tax Journal* 48, no. 4 (1995).

To capture the impact of the presence of Indian reservations, we include the sum of the state excise tax and the federal excise tax rate for those states with Indian reservations. This is effectively the tax differential between the home state and the tribal land, since taxes are not generally applied to cigarettes sold on Indian lands.*

Ideally, we would also like to include the tax differential with Canadian province(s) and Mexican state(s) for any U.S. states bordering Canada or Mexico. Unfortunately, accurate data on such tax rates, particularly for Mexico, were not available. Exchange rate fluctuations would further complicate the calculation of these tax differentials. As such, we simply include the sum of the home state excise tax and the federal excise tax for those states bordering either Canada or Mexico.

As described in Thursby and Thursby's 2000 paper, commercial smuggling primarily occurs either by "diversion" or "over-the-road."⁸⁷ Diversion involves the manipulation of accounting records, reporting only a portion of the sales.[†] Over-the-road smuggling occurs when bulk cigarettes are purchased legally in low-tax states and shipped to higher-tax states, where the cigarettes receive counterfeit stamps and enter legal markets.[‡] Our empirical model controls only for over-the-road smuggling, as has been common in the literature, with the exception of Thursby and Thursby (2000).

North Carolina has generally been modeled as the primary source of commercially smuggled cigarettes, and we follow the same convention. The tax differential between the home state and North Carolina is included as our measure of commercial smuggling. Distance from North Carolina is not included in the model, since much of the previous literature suggests that transportation costs account for less than 1 percent of cigarettes' total value. As such, transportation costs should exert a negligible impact on smuggling.[§]

Columns 3 and 4 of Graphic 12 provide the OLS estimation results of regressing the residuals from the log-linear naïve model against the tax differential and population variables described above. When interpreting these results, recall that the dependent variable is the actual per-adult sales minus the predicted consumption from the naïve model. This dependent variable represents net smuggling exports. Thus, a positive value of the dependent variable suggests the state is a net exporter of smuggled cigarettes, while a negative value of the dependent variable suggests the state is a net importer of smuggled cigarettes.

With the exception of the coefficient describing net smuggling to Canada, all estimates are of the correct sign and are statistically significant. An increase in the tax differential with North Carolina (our measure of commercial smuggling) is shown to reduce net smuggling out of the state, indicating an increase in commercial smuggling of cigarettes from North Carolina. States bordering Mexico or containing Indian reservations, and particularly states with larger tax

* Many states, including Michigan, have recently reached agreements with at least some tribes that have agreed to collect the state tax on sales of cigarettes to nontribe members.

† As indicated earlier in the paper, the term "diversion" is used by the ATF to include both "diversion" and "over-the-road" smuggling as defined here by Thursby and Thursby.

‡ Typically, the retailer sells these cigarettes at the market price and pockets the money saved by not purchasing the cigarette stamps required by law. The retailer may have paid the over-the-road commercial smuggler more than he or she would have paid a legal cigarette distributor, but the retailer's after-tax profits will still be higher than they would have been if the retailer had bought the cigarettes and stamps legally.

§ Thursby and Thursby, "Interstate Cigarette Bootlegging: Extent, Revenue Losses, and Effects of Federal Intervention," *National Tax Journal* 53, no. 1 (2000).

⁸⁷ Thursby and Thursby, "Interstate Cigarette Bootlegging: Extent, Revenue Losses, and Effects of Federal Intervention," *National Tax Journal* 53, no. 1 (2000).

rates, are shown to experience significantly increased smuggling imports from Mexico and the reservations, respectively.

The implications concerning casual smuggling are not as clear, as the coefficient of average tax rate differential is positive while the interaction term is negative. However, given the mean percent border population of 1.305, the impact of a \$1 increase in the average tax differential is clearly negative, leading to a 0.161 percent reduction in net casual smuggling out of the state.* This is consistent with the expectation that the larger the home tax rate is relative to the average bordering tax rate, the greater the net smuggling imports will be from the lower-tax neighboring states.

Graphic 12: Unexplained Per-Capita Sales From Naïve Model, 1990-2009

Dependent Variable:	Per-Adult Sales			LN(Per-Adult Sales)		
	[1]		[2]	[3]		[4]
	Coeff.		Std. Err.	Coeff.		Std.Err.
Ave. Tax Rate Differential [cents]	0.0681	***	0.0241	0.0007	***	0.0003
Percent Border Population [%]	4.9112	***	0.5667	0.0410	***	0.0061
Ave. Tax Differential * % Border Population	-0.1249	***	0.0115	-0.0013	***	0.0001
Canadian Border State Dummy * Tax [cents]	0.0236	**	0.0109	0.0002	0.0001	
Mexican Border State Dummy * Tax [cents]	-0.0766	***	0.0153	-0.0015	***	0.0002
Indian Reservation Dummy * Tax [cents]	-0.0620	***	0.0092	-0.0007	***	0.0001
NC Tax Differential [cents]	-0.0963	***	0.0156	-0.0014	***	0.0002
Constant	4.8161	***	1.0775	0.0518	***	0.0115
R-squared	0.4874			0.5295		
Number of Observations	940			940		

Notes: Statistical significance of 1 percent, 5 percent and 10 percent are represented by ***, ** and *, respectively.

Given the above estimation results, we compute smuggling by type as a percentage of estimated cigarette consumption in the state. Graphic 13 presents our state-level estimates of the percent of estimated cigarette consumption that was smuggled, both by type of smuggling and in total, for 2009, the last year in our dataset. Those states for which the percentage smuggled is negative are net importers of smuggled cigarettes. The table is ranked by net total smuggling imports as estimated here for 2009; the 2006 rankings are based on unpublished estimates by LaFaive, Fleenor and Nesbit.

* Admittedly, this figure is not large in economic significance. Nevertheless, the number is statistically significant, and it should be remembered that cross-border casual smuggling is only part of smuggling overall. Commercial smuggling rates respond quickly to cross-border tax differentials, and even with the relatively small percentage impact of tax differentials on casual smuggling, we see that tax changes have a noticeable impact on smuggling, both in total and in each component of smuggling.

Graphic 13: Estimated State Cigarette Smuggling Exports as a Percentage of Total State Cigarette Consumption (Legal and Illegal), 2009

State	Per-Adult Legal Sales	2009 Estimates				Rank by Net Smuggling Into State		
		Commercial	Casual	Canada/Mexico	Total	2006 Rank	2009 Rank	Rank Change
AL	75.60	-1.08%	4.06%	0.00%	3.02%	34	37	-3
AR	72.60	-9.17%	0.29%	0.00%	-8.84%	31	24	7
AZ	28.60	-8.56%	-9.81%	-18.94%	-51.84%	7	1	6
CA	28.80	-4.25%	-8.54%	-18.46%	-36.29%	6	5	1
CO	46.00	-5.74%	-9.80%	0.00%	-16.23%	14	17	-3
CT	45.90	-20.87%	6.93%	0.00%	-12.14%	22	20	2
DE	122.80	-10.46%	34.88%	0.00%	28.55%	47	46	1
FL	70.50	0.10%	-6.47%	0.00%	-6.36%	26	29	-3
GA	58.80	-0.27%	1.87%	0.00%	1.61%	35	36	-1
IA	53.80	-9.07%	-9.47%	0.00%	-19.98%	33	15	18
ID	52.40	-3.36%	5.41%	3.15%	5.30%	39	39	0
IL	45.20	-10.60%	4.26%	0.00%	-5.94%	17	30	-13
IN	78.90	-8.59%	8.70%	0.00%	0.88%	43	35	8
KS	49.10	-5.10%	-9.67%	0.00%	-15.38%	12	18	-6
KY	126.40	-2.64%	5.62%	0.00%	3.17%	40	38	2
LA	82.60	-0.10%	-6.62%	0.00%	-6.74%	27	28	-1
MA	34.60	-23.33%	18.37%	0.00%	-1.73%	13	32	-19
MD	35.40	-18.92%	-5.97%	0.00%	-26.43%	24	9	15
ME	52.30	-20.48%	2.59%	4.34%	-11.94%	15	21	-6
MI	50.60	-16.62%	-11.64%	3.52%	-26.04%	9	10	-1
MN	48.70	-11.79%	-11.38%	3.02%	-21.05%	10	14	-4
MO	97.20	2.44%	9.45%	0.00%	11.66%	44	44	0
MS	89.50	-3.22%	-5.68%	0.00%	-9.17%	37	22	15
MT	49.80	-11.84%	-13.16%	2.83%	-23.52%	8	13	-5
ND	72.90	-0.97%	-2.72%	2.07%	-1.56%	32	33	-1
NE	59.80	-3.08%	-3.58%	0.00%	-6.81%	23	27	-4
NH	116.60	-7.86%	11.86%	2.30%	7.79%	46	40	6
NJ	32.60	-29.11%	0.37%	0.00%	-28.61%	3	8	-5
NM	32.70	-5.72%	-4.12%	-23.57%	-37.15%	2	4	-2
NV	53.50	-9.78%	16.63%	0.00%	7.92%	29	41	-12
NY	24.80	-28.46%	-19.87%	4.87%	-47.53%	5	2	3
OH	61.60	-11.46%	2.03%	0.00%	-9.16%	19	23	-4
OK	79.00	-9.50%	2.39%	0.00%	-6.87%	25	26	-1
OR	48.40	-9.09%	-9.07%	0.00%	-19.28%	11	16	-5
PA	59.20	-14.80%	9.07%	0.00%	-4.38%	21	31	-10
RI	44.70	-12.39%	-18.23%	0.00%	-40.53%	1	3	-2
SC	85.00	3.54%	5.89%	0.00%	9.20%	41	42	-1
SD	49.70	-10.78%	-10.98%	0.00%	-23.72%	28	12	16
TN	77.00	-3.55%	3.64%	0.00%	0.23%	38	34	4
TX	42.30	-8.76%	2.07%	-24.13%	-33.29%	16	6	10
UT	27.60	-4.69%	-8.96%	0.00%	-14.10%	20	19	1
VA	73.40	1.28%	55.44%	0.00%	56.33%	45	47	-2
VT	48.90	-24.22%	8.86%	5.15%	-7.21%	30	25	5
WA	30.10	-19.74%	-14.45%	4.15%	-31.75%	4	7	-3
WI	53.30	-12.36%	-10.96%	0.00%	-25.72%	18	11	7
WV	115.80	-2.78%	15.31%	0.00%	12.97%	42	45	-3
WY	76.70	-3.58%	13.57%	0.00%	10.47%	36	43	-7

Notes: Because the table provides smuggling exports, the smuggling percentage is negative when the state is a net importer of smuggled cigarettes, and the percentage is positive when the state is a net exporter of smuggled cigarettes. The sum of commercial, casual and Canada/Mexico smuggling does not equal the totals presented in the final column due to the nonlinear nature of the model. North Carolina, Hawaii and Alaska are not included.

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