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Executive Summary

- The tobacco industry fights increases in cigarette excise taxes with inflated claims of smuggling and its associated crime.

- The tobacco industry makes public statements regarding its commitment to stopping smuggling and the negative effects it has on their business, despite their internal knowledge that smuggling does not have a negative impact on the cigarette companies.

- The tobacco industry acts cooperatively to create the impression that there is grassroots level opposition to increased tobacco taxes.

- Once tax increases are implemented, the tobacco industry, contrary to its rhetoric, uses the tax increase to mask wholesale price increases. On average, the tobacco industry increases wholesale prices by 150% of any tax increase. Additionally, the tobacco industry appears to have increased cigarette prices by 605% of the first year cost of the Master Settlement Agreement.

- Previously published studies that analyzed data from various time periods between 1950 and 2000 have estimated that 2% to 6% of cigarettes are smuggled within the United States.

- The economic motivations for smuggling cigarettes in California are substantially lower in 2003 than they were in the early 1970s.

- Our new estimate of smuggling in California shows that 1% to 4.2% ($7 million to $45 million annually in lost tax revenue compared to $1.1 billion in cigarette taxes actually collected by the state) of cigarettes smoked in California are smuggled. The methods and results are consistent with the previously published literature.

- The California Board of Equalization differs from previous scientific studies and has estimated that smuggling is California 12% to 27% of cigarettes smoked, 5-10 times what all other authorities have estimated.

- The Board of Equalization uses unconventional and unreliable methods.
    - The first BOE report (1999) utilizes an estimate of the level of smuggling based on national experience during the 1980s. It ignores the effect of California's large and effective tobacco control program on cigarette consumption; it implicitly assumes that any drop in cigarette tax-paid sales in California beyond the drop expected from price increases was a result of increased smuggling rather than smokers cutting down or quitting as a result of the California Tobacco Control Program.
    - The second BOE report (2003) is based on a biased sample of small retail outlets where one would expect illicit sales to be most likely. Stores such as Walmart, Sam's Club and Costco are assumed to sell smuggled cigarettes to the same extent as the small retail outlets.

- For these reasons, the BOE estimates should not be used as a basis for making public policy.

- Even if one accepts the BOE's very high estimates of smuggling, increasing the cigarette tax will increase state revenues.

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Introduction

        The tobacco industry understands the negative impact that increases in state and federal excise taxes has on its businesses.[1] Higher taxes mean higher prices, which reduces cigarette consumption and tobacco industry revenues and profits. To fight tax increases the industry uses exaggerated claims about smuggling and works to create "populist" support to fight tax proposals. In contrast to industry claims, the broad consensus among independent economic studies (from 1955 to 2003) have shown in the United States that cigarette smuggling has remained at 2% to 6% of total consumption.[2-9] The lone exception to this consensus has been the California Board of Equalization (BOE), which has estimated that 27% of cigarettes smoke in California are smuggled.[10, 11] This represents $292 million of lost excise tax revenue for 2002.

        Despite claims that the industry opposes tax increases to "help the little guy," after tax increases pass, the tobacco industry uses the tax increases as an opportunity to mask increases in wholesale prices. While the tobacco industry blames the government for the retail price increase seen by consumers, on average they increase the price of a pack of cigarettes by 150% of any tax increase.

        During debates regarding tax and licensing tobacco retailers in California, there have been assertions that increasing cigarette taxes would increase smuggling and so lead to substantial loses in state tax revenue. In particular, based on its extreme estimates of the amount of smuggling in California, the Board of Equalization has estimated that the state would have collected an additional $292 million above the $1.07 billion in tax revenues actually collected in 2002 had there been no smuggling. (A more realistic estimate base on the 2% to 6% range is $21 to $64 million.) Because of the relationship between price and consumption of cigarettes (the price elasticity), however, even if one accepts the BOE's estimate of the effects of smuggling, the state would still gain net revenues with any tobacco tax increase below $11 per pack. Using more realistic estimates of the amount of smuggling would lead to even higher revenue gains for the state through increased cigarette taxes. Smuggling is not a reason not to increase state tobacco taxes.

The Tobacco Industry's Fight Against Tax Increases

Smuggling

        Whenever governments contemplate tobacco tax increases, the tobacco industry and its allies vigorously raise the specter of a fiscal and criminal disaster in the form of increased organized wholesale smuggling. The tobacco industry spends time and money to publicize the message that tax differentials within the United States stimulate smuggling on a massive scale when state tax rates increase. The tobacco industry often cites the experience of other countries, principally Canada, to exemplify the effects that increased taxes, state or federal, could have in the US.

        In 1991, the Minnesota state legislature was considering raising the excise tax in Minnesota by $0.24, from $0.38 to $0.62. Alice O'Connor of the Tobacco Institute (the tobacco industry's lobbying arm at the time), drafted, their March 4, 1991 "Plan to defeat 24 cent tax in MN".[12] Part of the plan was to demonstrate the ease of smuggling and the extra profits smugglers would earn in the event of a tax increase, including a

> *Media event showing a van load of empty cigarette cartons driven from Kentucky to MN State. Capitol demonstrating profits associated with bootlegging cigarettes under the Governor's proposal.[12]*

In 1994, California, Colorado and Arizona were all considering increases in their state excise taxes on cigarettes and Congressman Pete Stark (D-California) had introduced a proposal to increase the federal excise tax by $1.25 per pack. The National Coalition Against Crime and Tobacco Contraband, which was secretly funded by RJ Reynolds Tobacco,[13] retained the forensic accounting and business valuation firm Lindquist Avey MacDonalds Baskerville to analyze cigarette smuggling in the United States. Comparing the US to Canada prior to the Canadian tax increase, Lindquist concluded that:

> *If federal and state tobacco taxes are increased, the result will be lost government revenues, increased activity by criminal groups, undue hardships to retailers and distributors who refuse to handle contraband cigarettes, and the initiation of a large segment of the population into criminal activity and tax evasion."[14]*

The report did not mention that the root cause of the Canadian smuggling problem was not the tax increase, but rather the behavior of Reynolds, who funded the study. After the Canadian tax increase, Reynolds significantly increased their shipments of cigarette brands that are popular only in Canada to duty free shops along the US-Canada border, increasing the supply of cheaper cigarettes available for smuggling back into Canada.[15] Reynolds executives have subsequently been indicted and convicted for this plan.[16]

Philip Morris also featured Canada in its 1994 campaign against an increase in the Federal Excise Tax (FET). Ellen Merlo, Vice President of Corporate Affairs at Philip Morris U.S.A., explained this strategy during a presentation at a Philip Morris USA Management Meeting. Stating first that "Defeating FET – remains one of our key objectives for 1994,"[17] she goes on to explain how the recent experiences in Canada could be used in the fight against increased FET.

> *For example, when Canada announced it was rolling back its tax on cigarettes because of the increase in smuggling and other crime that the tax had created, we got a video news release [VNR] out immediately. We distributed the VNR via satellite that same morning that Canada announced it was lowering the tax. Our story got play in major media markets across the country.[17]*

The fears raised by the industry exaggerated the effects of smuggling in Canada, and the positive effects on tax revenues that a reduction in the tax would have. Contrary to the industry's claims, after Canada cut cigarette taxes to reduce smuggling, federal and provincial government tax revenues fell Cdn$1.2 billion the year after the tax cut. Especially important, smoking among children increased after cigarette price fell following the repeal of the tax.[16]

In June 1997 the tobacco industry and several state attorneys general announced a proposed "global settlement" of state and private lawsuits against the tobacco industry.[18] Part of the agreement provided the industry with immunity from future lawsuits, subjected the tobacco industry to regulation by the Food and Drug Administration, and increased the federal excise tax on cigarettes. These provisions of the settlement required federal legislative action. Arizona Senator John McCain, then chairman of the Senate Commerce Committee, sponsored the legislation (Senate Bill 1415) that would have implemented provisions of the settlement. The bill passed the Commerce Committee unanimously, but not without amendments increasing the excise tax to $1.10 per pack, which was beyond what the tobacco industry had agreed to accept (as well as other provisions that the industry opposed).

During the debate over the McCain Bill the tobacco industry and its allies argued that the proposed increases to U.S. cigarette prices would create a "thriving black market in cigarettes"[19] supported by cigarette smuggling that "may increase beyond our control"[19] while "exploding the ranks and profits of organized crime."[19] The tobacco industry argued that illegal cigarettes would be analogous to alcohol during the Prohibition, creating "the most massive black market this country has seen since the Prohibition days of the 1920's."[20] These arguments do not address the source of the cigarettes for the

smuggling, that would necessarily need to be international in order to avoid the federal tax, or the fact that bootlegging during Prohibition did not require the complicity of large multinational corporations (as the only producers of cigarettes) as opposed to alcohol, which could be produced in small stills.[15]

Effects of Smuggling on the Tobacco Industry: Public vs. Private Statements

The tobacco industry claims that the government is not the only sector that suffers from smuggling; it argues that smuggling hurts it financially, too. An August 22, 1997 private letter from Philip Morris to investigative reporter Christopher Drew at the *New York Times*, responding to his questions about cigarette smuggling claimed negative effects of smuggling on Philip Morris's business:

> *Contraband is always a problem for the tax authorities, <u>but it also has a negative impact on our business</u>, and at times is a disaster for us…In a number of countries the disruption to our business caused by contraband has jeopardized major manufacturing investments which we have made in those countries. In some cases we have expended tens and even hundreds of million of dollars in factories, equipment, and the hiring and training of work forces only to have our sales replaced by cheaper smuggled products which pay no import duties or excise duties.[21]* [emphasis added]

The concern over the effects of smuggling on Philip Morris described in this letter is contradicted by internal Philip Morris emails that suggest that a high level executive felt uncomfortable publicly making the argument that smuggling adversely impacts the tobacco industry. On Monday, June 1, 1998, Brendan McCormick, a company spokesperson, emailed Karen Daragan, Manager of Media Relations at PM-USA, and Ellen Merlo, Vice President of Corporate Affairs at PM-USA, an attachment with "talking points" for an ABC television news special program on tobacco smuggling. Among these "talking points" is the claim that smuggling has a negative impact on the cigarette business:

> *Philip Morris U.S.A. always conducts business in full compliance with the law. The company has never condoned or supported cigarette smuggling. On the contrary, we work with federal (true?), state and local governments to stop bootlegging within the United States. There are limits, however, to our ability, alone, to affect the cigarette smuggling problem… The primary cause of cigarette smuggling appears to be high excise taxes on cigarettes. High levels of taxation provide an incentive for smugglers to profit by evading those taxes, creating a black market. <u>Illegal cigarette smuggling can have a serious impact on our business.</u> It leads to the creation of an illegal distribution chain which competes with our normal distribution system, hurting the law-abiding wholesalers and retailers who sell our brands. In many instances, this distribution chain is controlled by organized crime and is also used to smuggle other contraband including drugs and firearms.[22]* [emphasis added]

The following morning, Merlo sent a follow-up email to Daragan and McCormick, stating her reservations regarding the talking points. She was especially concerned with what she called the "financial case," as well as the need to limit the statement to PM-USA's activities.

> *jacquie should see this too. I actually do not think we can say this. also, on this I want marty in the loop. I think this goes too far. also, I think we should limit our discussions to what we, pm usa, has done here in the states. there should be no reference to pmi. also, <u>don't think that we can make the financial case.</u> we obey the law, our efforts, excise tax lead to it. etc.[23]* [emphasis added]

This series of emails suggests that executives at Philip Morris knew that smuggling did not hurt its profits. That Merlo expressed anxiety about making the "financial case" that Philip Morris is hurt by smuggling is not surprising. Cigarette smuggling actually helps the tobacco industry in two ways.

Smuggling provides cheaper cigarettes to consumers and mitigates the drop in smoking caused by price increases induced by tax increases, yet the revenues to the companies do not fall, since they still receive the full wholesale price of the cigarettes.

It is interesting that Merlo took pains to limit the statement to the US. International smuggling benefits the multinational tobacco companies.[15] Smuggling allows the US brands to enter international markets are closed to US cigarettes. these markets and gain market share.[24]

Working Together

The tobacco industry does not hesitate to cross company lines in order to fight tax increases. A R.J. Reynolds report titled "FET [Federal Excise Tax] Grassroots Program, Spring '98" was faxed to Philip Morris in 1998 to share its multi-pronged strategy on how to rally the public to fight the McCain Bill and its proposed increase in the federal excise tax:

> *To ensure maximum effectiveness in a program to fight a massive FET, we need a multi-pronged approach that:*
> > *1. Mobilizes the citizenry in targeted districts to call, write, and visit their federal elected officials.*
> > *2. Unleashes the pent-up energy of the D.C.-based conservative organizations, all of whom have detested the settlement package from Day One but who have largely stayed on the sidelines (at our behest).*
> > *3. Involves the awesome powers of the industry via the retailers and sales forces the different companies to make things happen NOW especially at the retail*
> *...We need a combination of inside-D.C. pressure and in-district energy to convince legislators that a big tobacco tax increase isn't a political slam dunk for them, but instead raises serious problems for them.[25]*

The tobacco companies orchestrated cooperative strategies to combat the FET increase. According to this RJR report, companies were assigned specific duties: "Wherever possible, the Companies should split up tasks into manageable pieces. For example, Philip Morris takes one subset of coalitions, RJR another, B&W [Brown and Williamson Tobacco] another…Telephone and direct mail programs can be separated according to geography."*[25]*

Populist Rhetoric

A March 4, 1991, Tobacco Institute internal memorandum, a "to do" list for fighting an increase in cigarette taxes in Minnesota shows how Philip Morris planned to pen letters to newspaper and periodical editors and get outside parties, obtained by Philip Morris, to sign them.[12] The industry also set up telephone banks with toll-free numbers, sometimes connecting callers directly through to congressional offices, and has circulated printed postcards and petitions that require only a signature. Many of the pro-industry postcards received by legislators bore the imprint of the National Smokers Alliance, formed in 1993 by the public relations firm of Burson Marsteller for Philip Morris.[26]

Cigarette companies target lower income customers with the intent of enlisting them in their anti-tax crusade. A 1984 anonymous Philip Morris document titled "How to Stop Any Tax Increase Anywhere"[27] shows how the company sought to target lower income smokers to write their elected officials to protest increases in cigarette taxes. This document appears to be a rough draft of a sample letter to be mailed to members of the target group urging them to write their relevant legislators opposing an increase in the cigarette tax. The note gives the following three step process: "1. Get a list of legislators who favor it. 2. Break them down by our mailing groups. 3. Send letters, roughly as follows: (To lower income groups)."[27] The sample letter emphasizes the satisfaction the individual would get from making a difference, and actually being heard by lawmakers:

You can make [your letter] as short as you want. Just get across that (1) you're a voter in his district – give your name and (2) that you oppose any increase in taxes on cigarettes. That's it. It's as simple as that. If the phone is busy, that's good. It may mean that other smokers are getting the message across, too. But in the game of politics, numbers count, so keep on trying. Tomorrow, the next day or the day after, until you get through. All of us complain about politicians and unfair taxes but few of us ever do anything about it. This is our chance to be heard. And all it takes is a phone call…And after you make it, you'll be able to say that this was one time when you really did something about unfair taxes.[27]

This rhetoric of empowering "the little guy" is echoed in a 1993 Lorillard memorandum from JR Cherry, Vice President and Deputy General Counsel at Lorillard, to all of the company's New York personnel. The memo creates the image of pitting the cold, calculating politician against the vulnerable family man oppressed by government. The memo urges all company personnel to write Congress and the President as affected *individuals,* not as tobacco company workers. The memo explains that faceless institutions are not listened to by politicians, but that individuals – with children to feed and educate – are better positioned to urge politicians to listen to their needs:

Politicians tend to be insensitive to institutions, especially commercial ones. Institutions have no face, do not vote, have no emotion, do not get hungry, do not raise families. Why, after all, should a politician respond to them?

But people are another matter. When people speak politicians listen. They should listen and they have to. Here's our chance to speak to some effect on something which may effect us in no small way.

Typically, one would say to the President or a congressman that a tax increase would be unfair, discriminatory and regressive, but these are sterile abstractions and not the words of wage earning Americans like you and me. We bleed, and our elected officials on the whole may wish to keep us from harm's way – if they know we're out there. I suggest we let them know and now…

If your livelihood, career, family, educational funds for children, pride and purpose rely on this product, you have an interest, and the President and your congressman ought to know about it – not on Company paper, not as a Company person, it's you that's at issue, and your kitchen table and household paper are the tools to make a difference. I urge you to do so.[28]

The Lorillard memo presents exacting details concerning how to compose a letter to the President and to Congressmen, urging handwritten letters that include the following points: increasing cigarette taxes could cost innocent employees their jobs; tobacco employees would like to be good consumers and stimulate the economy, but they can only do so if they are confident about the stability of their jobs; increased cigarette taxes hurt the "little guy" wage-earner far more than it hurts big tobacco companies; it is unfair to single out one group of people to pay for government expenses.[28] Another 1993 Lorillard memo directed to all division managers urges them to help fight the "monster tax"[29] that "The President and many in congress are talking about"[29] by getting their employees to write letters to their Congressman:

At your next sales meeting, if scheduled prior to June 15, ask your sales Reps,…and part time employees to send a handwritten note (handwriting makes the most impact) to their congressman AND the White House telling them in their own words that they're against a cigarette tax hike and <u>why</u> they think it's a bad idea. The focus of the letters should be on the adverse economic impact on <u>their</u> job and <u>their</u> family. Don't use Lorillard stationary or envelopes. Have them mail their letters from their homes before June 15…"[29] [emphasis in original]

Estimated Level of Smuggling in California

Previous Estimates

Despite the industry rhetoric, domestic evidence consistently indicates that cigarette tax increases do not cause widespread smuggling and tax evasion in the US (Table 1). Previous work by a series of academic investigators[3, 4, 6-9] and a report by the Advisory Commission on Intergovernmental Relations* (ACIR)[2] Used analysis of economic data to show that, while cigarette smuggling does exist, it is not a substantial national problem with smuggled cigarettes representing 2% to 6% of the market. The California Tobacco Survey, using results of a random survey of California residents that enquired where they obtained their cigarettes, confirmed that this is true for California as well.[5] The survey found that soon after the passage of Proposition 10, which raised the state's excise tax by fifty cents in 1999, that 4.5 percent of all cigarettes were purchased in nearby states, from Indian reservations or military bases, via the Internet, or were otherwise avoiding the state's cigarette tax.[5]

Types of Smuggling

Three broad classifications can be used to encompass all types of smuggling.

- *Individual Bootlegging:* For Californians, individual bootlegging includes either driving across state borders to Oregon, Nevada or Arizona to purchase cigarettes and pay the lower state excise taxes in those states, visiting Indian reservations or military bases for tax free cigarettes or using the internet to purchase cigarettes without paying any state tax.

- *Organized Wholesale Domestic Smuggling:* Organized wholesale smuggling is defined as the bulk purchasing of cigarettes in low tax states such as North Carolina and Virginia, trucking them across the United States to California and selling them to cigarette retailers who would then sell them to consumers, fraudulently, as fully tax paid cigarettes. As discussed above, the tobacco industry focuses its media efforts on organized smuggling and its associated increase of organized crime and violence to scare state governments away from raising cigarette excise taxes.

- *International Smuggling:* International smuggling takes two forms. One form is the smuggling of cigarettes that were either exported to Mexico or purchased at duty free shops, brought into Mexico, then back across the Mexican border into California. The other form, alleged in Phillip Morris lawsuits filed in Arizona, California, Texas, Florida, New York, Washington and Louisiana, is that counterfeit cigarettes are being manufactured in other countries and smuggled into California.[31]

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*ACIR was established by the 86th Congress (Public Law 86-380; 73 Stat 703) as a "permanent, bipartisan body of 26 members, to give continuing study to the relationship among local, state, and national levels of government."[30]

Table 1. Summary of Previous Smuggling Studies

Study	Time Analyzed	Location	Result	Description	Type of Smuggling	Methodology
ACIR (1985)[2]	1981-1983	United States	4.5% in California	Examined the effects of tax differentials of bordering states and tobacco producing states effect demand for cigarettes. Study was performed nationally with state specific estimates provided	Bootlegging & Domestic Wholesale	Regression, Index
Baltagi & Levin (1985)[3]	1963-1980	United States	Smuggling Elasticity = -.06	Examined the effects of tax differentials of bordering states and tobacco producing states effect demand for cigarettes	Bootlegging & Domestic Wholesale	Regression, Index
Thursby et al (1991)[8]	1975-1982	United States	Smuggling Elasticity = -.03	Examined the effects of tax differentials of bordering states and tobacco producing states effect demand for cigarettes	Bootlegging & Domestic Wholesale	Regression, Index
Becker et al (1994)[4]	1955-1985	United States	Significant Smuggling	Included a smuggling index based on state to state tax differentials in estimating cigarette demand. No discussion of the estimate is provided.	Bootlegging & Domestic Wholesale	Regression, Index
Saba et al (1995)[6]	1960-1986	California	<2% of cigarettes	Examined the effects of tax differentials of bordering states and tobacco producing states effect demand for cigarettes. Study was performed nationally with state specific estimates provided	Bootlegging & Domestic Wholesale	Regression, Index
Thursby & Thursby (2000)[7]	1972-1990	United States	3.31% of cigarettes	Examined the effects of tax differentials of bordering states and tobacco producing states effect demand for cigarettes	Bootlegging & Domestic Wholesale	Regression, Index
Yurekli & Zhang (2000)[9]	1970-1995	United States	6% of cigarettes	Examined the effects of tax differentials of bordering states and tobacco producing states effect demand for cigarettes	Bootlegging & Domestic Wholesale	Regression, Index
Gilpin et al (2001)[5]	1999	California	4.5% of cigarettes	Used data collected from the California Tobacco Survey to estimate consumers tax avoidance behavior.	Bootlegging	Survey Data
Alamar et al (2003)	1970-2002	California	1% to 4.2% in California	Utilized the tax to price ratio to estimate total smuggling, (domestic and international).	Bootlegging, Domestic Wholesale & International	Regression, Index
BOE (1999)[10]	1999	California	12% to 26% in California	Assumed that 25% of any drop in sales was attributable to smuggling	Bootlegging, Domestic Wholesale & International	Regression, Constant Smuggling
BOE (2003)[11]	2001-2002	California	27% in California	Used data collected from the California Tobacco Survey to estimate consumers tax avoidance behavior. Extrapolated organized smuggling estimate from BOE Investigations survey	Bootlegging, Domestic Wholesale & International	Survey Data

Review of Methodology

Table 1 summarizes all the relevant studies of smuggling we could locate, methods used, time analyzed and results of each of the studies. There are two basic methodologies used: regressions and surveys.

In the regression analysis, the demand for cigarettes is estimated by estimating tax paid sales based on price, demographic variables and variables designed to quantify the incentive for smuggling. These smuggling index variables are calculated for bootlegging, which factor in the tax differentials of border states,[9] as well as populations living close to the border states and for organized smuggling that take into account the tax differentials from Virginia, Kentucky and North Carolina where the vast majority of organized smuggling is thought to originate.[9] The exact indexes and procedures used vary slightly among studies, but are essentially the same. For example, an increase in the excise tax in California, with no corresponding increase in Nevada, would increase the incentive for a smoker to drive across the border to purchase their cigarettes. The tax increase would then result in an increase in the smuggling index. Because of the association between the index and a smoker's incentive to smuggle, smuggling levels can be estimated.

Using the regression methodology, for example, Thursby and Thursby[7] estimate bootlegging and organized wholesale domestic smuggling to be, on average, equal to 3.31% of cigarettes smoked nationally from 1972-1990[7] and Yurekli and Zhang[9] found that on average 6% of all cigarettes smoked nationally were smuggled domestically from 1970-1995. For California, Saba et al[6] estimated that less than 2% of cigarettes were smuggled in California from 1960-1986[6] and the ACIR study[2] estimated that 4.5% of cigarettes were smuggled in California from 1981-1983.[2]

Since the measures used for smuggling are based on tax differentials between states, these estimates do not account for any international smuggling. Other studies have used this methodology and found statistically detectable levels of domestic smuggling, without quantifying the actual amount of smuggling.[3, 4]

Gilpin et al[5] used the 1999 California Tobacco Survey conducted by the Cancer Prevention and Control Program at the University of California, San Diego to estimate the effect of the $0.50 increase in the tobacco tax mandated by Proposition 10 in 1999. To ascertain where consumers purchased their cigarettes, the survey asked two questions:

Do you usually buy your cigarettes in California, out of state, or over the internet?

[Those who answered that they purchased in California where then asked]
Where do you usually buy your cigarettes? Do you buy them...
- *At convenience stores or gas stations*
- *At supermarkets*
- *At liquor stores or drug stores*
- *At tobacco discount stores*
- *At other discount stores such as Wal-Mart*
- *On Indian reservations or*
- *In military commissaries?[5]*

Using the responses to these questions, they determined that, in 1999, 4.5% of cigarettes smoked in California were purchased via individual bootlegging, including military commissaries, Indian reservations, the Internet, out-of-state and other non/lower-taxed sources. The survey results provide an estimate of bootlegging, but not organized domestic or international smuggling. Consumers are generally unaware of whether they have purchased cigarettes that have been smuggled at the wholesale level so the survey does not attempt to identify these types of smuggling.

These studies provide a general framework for estimating smuggling and a broad agreement on the estimated level of smuggling. These estimates can be used as a benchmark to compare other estimates. Estimates that very greatly from these, such as those by the BOE[10, 11] need to be able to explain the difference in the estimates.

California Board of Equalization Estimates

In direct contrast to the published results in the scientific literature of 2%-6%, the California Board of Equalization has estimated that in 2002, 27% of all cigarettes smoked in California were smuggled.[11] Based on this estimate, BOE estimated that California lost $292 million of excise revenue to smuggling. The BOE had previously estimated that 12% to 26% of cigarettes smoked in California were smuggled (between $130 million and $270 million lost revenue annually).[10] The two estimates were produced with radically different methodology than the rest of the research done to estimate smuggling.

The first BOE study[10] was done in 1999 and estimated that smuggling of all types was between 12% and 26% of cigarettes in California (at an estimated cost to California tax payers of between $130 million to $270 million annually compared to $847 million actually collected). The second study[11] estimated that in 2002 27% of all cigarettes in California were smuggled (at an estimated loss of $292 million in excise tax revenue compared to $1.07 billion actually collected). The BOE did not follow established methodologies to obtain its estimates.

1999 BOE Report

The 1999 BOE estimate[10] is based on the difference in actual tax paid sales and their projections of what sales would have been had the tax remained at 37 cents instead of increasing to 87 cents in 1999.[10] The difference represents the change in tax paid sales associated with tax increase. A portion of the drop in tax paid sales is due to reduced consumption and a portion is due to increased smuggling of all types. The BOE simply *assumes* that 25% of the difference is due to smuggling.[10]

The 25% estimate BOE used was taken from the 1985 ACIR report on cigarette tax evasion,[2] which was an update of their previous 1977 report.[32] The 1985 ACIR study, in fact, found that only 4.5% of cigarettes smoked in California were smuggled. This estimate included both bootlegging and organized domestic smuggling.[2] The 4.5% was calculated based on their estimates using a smuggling index similar to those used in other studies.

The ACIR report, separately from their estimation of smuggling, calculated the expected variation of sales due to price and estimated the actual variation of sales due to price and found that for every 1 cent increase in price, per capita cigarette sales would decrease by 0.63 packs. This expected drop in sales of 0.63 was equal to 75% of the drop in sales due to price that the ACIR estimated would be equal to 0.85 packs for every 1 cent increase in the price. They then suggested that the remaining 25% of the estimated 0.85 drop in sales was "not explained" by price increases and *could be* due to smuggling. For a complete explanation of calculations in the ACIR report see the Appendix. Contrary to what the BOE assumes, the ACIR did not conclude that 25% of cigarettes were smuggled; ACIR set that number at 4.5%.

The ACIR report based the expected drop in sales due to an increase in price, of -0.63, on a price elasticity of -0.34.[*] While this estimate is in the range of estimated price elasticities it is on the low end of the estimated elasticities in the studies cited above[3, 4, 7, 9] (-0.26, -0.78). Higher elasticity would mean that sales would decline more in response to a price increase and raise the expected drop in sales due to price increases, thereby reducing the "unexplained" drop in sales that could theoretically be due to smuggling, quitting smoking for health reasons or other factors. For example, using price elasticity estimate of -0.4

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[*] Elasticity is a measure of the sensitivity of consumers to the price of a product. A price elasticity of -0.34 means that for every 10% increase in price, consumption will drop by 3.4%

would drop the estimated 25% of the "unexplained" change in sales to 13% (see the Appendix for the calculations).

Instead of using the estimated 4.5% level of smuggling in California that is estimated in the ACIR study,[2] the BOE used the ACIR estimate attributing the entire "unexplained" change in tax paid sales, 25%, to smuggling. The attribution of the 25% of the change in tax paid sales to smuggling is particularly appropriate as an estimate of smuggling in California. The mathematical model used by the ACIR does not include the effects of tobacco control programs, yet California has had a large and effective tobacco control program in effect since 1989.[33, 34] The BOE ignored the effect of the tobacco control program and simply assumed that any reduction in cigarette consumption beyond that estimated based on price changes in the ACIR study in a national sample in the early 1980s was simply due to increased smuggling.

It is not clear why the BOE used this approach rather than taking the more obvious approach of simply using the ACIR's direct smuggling estimate of 4.5%.[2] The BOE makes no attempt to alter the ACIR analysis to account for the problems detailed above, likely because there is no way to account for all of them without redoing the entire analysis. The BOE also does not reconcile their results with the other research on cigarette smuggling cited above, all of which estimated significantly lower levels of smuggling.

2003 BOE Report

The BOE report of 2003 scraps the entire methodology of the 1999 report in favor of the use of two surveys.[11] In order to address the problem of bootlegging, the BOE uses the California Tobacco Survey and to address domestic wholesale and international smuggling they use the results of the BOE Investigations Division's survey of retailers.

For bootlegging, the BOE included just the out-of-state and internet sales numbers from the California Tobacco Survey to determine that 3.4% of cigarettes in 1999 were purchased via individual bootlegging. (This estimate is lower than the produced by Gilpin et al[5] because it included Indian reservations and military commissaries to determine that 4.5% of cigarettes were purchased via bootlegging.) Because the survey was performed in 1999, the BOE increased the 3.4% to 5% in 2002 to "allow for growth in the general use of the internet for online shopping since the survey was made in 1999."[11] Holding other forms of bootlegging constant, this assumption implies that 2% of cigarettes were purchased via the internet in 2002 which is consistent with at least one other study.[35] Multiplying the 5% by the 1.2 billion tax paid packs of cigarettes, the BOE estimate that bootlegging accounts for 61.9 million packs of cigarettes in 2002 or $53.9 million of lost revenue. These estimates are consistent with the scientific literature.

The BOE then estimated total international and domestic organized wholesale smuggling by using the results of inspections of the BOE Investigations Division. The Investigations Division inspected approximately 1,300 "relatively small retail outlets of the estimated total of 85,000 ... locations in California."[11] In these investigations the BOE found that 25.3% of the retail outlets they visited had an average of 736 packs of untaxed cigarettes (there was no differentiation between internationally and domestically smuggled cigarettes).

The BOE then estimated that 21,505 of the 85,000 locations that sell cigarettes (85,000 x 25.3%) sell cigarettes that have been smuggled via organized domestic or international smugglers. Assuming that retailers turn over their inventory every 3 weeks, BOE computed that each location will sell 12,757 smuggled packs of cigarettes per year (average untaxed packs per location of 736 x 52 weeks / 3 weeks average turnover). Multiplying the 21,505 locations that sell smuggled cigarettes by the 12,757 estimated untaxed packs sold per year, they estimate that 274 million packs of untaxed cigarettes were sold to consumers in 2002. 274 million untaxed packs of cigarettes, multiplied by the tax rate of $0.87 yields the estimate that California lost over $238 million in excise tax revenue due to domestic organized wholesale

smuggling and international counterfeiting.[11] Adding the $238 million of lost revenue due to organized domestic and international smuggling to the $53.9 million of lost revenue due to bootlegging, they estimated that California lost $292.3 million in excise tax revenue due to smuggling.

The 1,300 retail locations investigated by the BOE, however, are not a representative random sample of the population of all 85,000 retail locations that sell cigarettes in California. The outlets investigated were "small retail outlets."[11] No data are presented as to how these outlets were chosen, what fraction of the total qualify as "small retail outlets" or any other measure to suggest that the 25% of retailers found to have untaxed cigarettes could be applied to the entire population in any statistically reliable way. Presumably, since the investigations were carried out by the Investigations Division, at least some of these outlets were chosen based on tips or other evidence that they did have untaxed cigarettes.

The BOE ignored large retail outlets, like chain grocery or drug stores that probably would be less willing to engage in illegal activity. For the BOE estimates to be correct, large retailers such as Walgreens, Walmart, Costco, Sam's Club and Safeway would have to be selling smuggled cigarettes to the same extent as "small retail outlets." The BOE presents no data to support this unlikely assumption.

The unscientific manner in which the BOE Investigations survey was performed, the inconsistent manner in which the results of the survey were applied and the total estimate of smuggling that is a factor of 5 -10 times greater than any other published estimate bring the 2002 BOE calculations into question. Neither BOE report attempts to reconcile their results with previous studies or explain why California would be such a hotbed of smuggling activity.

Quantifying the Motivation for Smuggling

The motivation for smuggling is for the smuggler to pocket money that should have been paid in taxes (either in the form of a lower price to the consumer or increased profits to the seller). Since all of the above studies attribute smuggling to taxes, it is important to place the current level of cigarette taxation in California into historical perspective. The tax, as a percentage of the retail price is a measure of the incentive for all types of smuggling activity.

The individual bootlegger's decision on whether to drive over state lines or purchase via the internet will be affected, not by the dollar value of the tax, but rather, the percent savings they would realize from making the trip. An individual looking to by an expensive piece of jewelry, for example, could avoid the California state sales tax of 8.25% by simply driving across state lines and paying the no sales tax in Oregon or purchasing via the internet to avoid all sales tax. On a $2000 bracelet, that would be a savings of up to $165 (more than would be realized on a week's worth of cigarettes), yet the jewelers in California do not appear to be suffering greatly from any bootlegging activity. This fact is because an individual is not likely to put forth the effort to bootleg the jewelry when they will only save 8.25% of the purchase price. If there were an additional state tax of 30% on jewelry, however, some bootlegging might occur, because a 30% savings is more enticing.

The percentage of the total price represented by the tax determines the profitability of domestic organized wholesale smuggling. The potential profit margin is more important to the wholesale smuggler than the actual dollar value of the tax, due to the fact that even organized crime has a limited amounts of money that they can invest in a business activity.

Consider a situation in which a potential organized smuggling ring has $1000 to invest in illicit, profit making activities. If the excise tax on cigarettes is $1, the wholesale price of cigarettes is $4 and the retail price of cigarettes is $5, the ratio in would be 20%. In this case, with $1000 the smugglers could afford to purchase 250 packets of cigarettes ($1000/$4 per pack) which would give the smuggling ring a profit of $250 (250 packs x $1 profit) before transportation costs, yielding a profit margin of 25%

($250/$1000). If, instead, the wholesale price was $9 and the retail price was $10, so that the ratio is 10%, the payoff to the smugglers changes dramatically. Now the smugglers can only afford to purchase 111 packs ($1000/$9) for a profit, before transportation costs, of $111 (111 packs x $1 profit) or a profit margin of 11%. As this example illustrates, for any smuggling ring, as for all business legitimate and otherwise, the potential profit margin is very important. Higher potential profit margins imply higher return on the money invested in the operation and thus higher profits ($250 vs $111 in the example). Assuming that transportation costs do not vary greatly in real terms then, the tax as a percentage of the retail price is a good measure of the incentive for organized domestic smuggling.

The two forms of international smuggling discussed above should also be highly correlated with this percentage. Organized reimportation of cigarettes from Mexico will follow the same rationale as the domestic smugglers (except that they are avoiding the federal rate as well). The international counterfeiters will have a slightly higher potential profit margin, because they manufacture their own cigarettes and thus capture the wholesalers profits as well as the distributors profits, but if it is assumed that the percentage difference in the potential profit margins faced by counterfeiters and domestic smugglers is constant and transportation costs are also held constant, then again, the tax to retail price ratio can be seen as highly correlated with the potential profit margin for international counterfeiters.

The studies examine smuggling at various times from 1955 through to 2002, thus change in California taxes during that period is informative for evaluating the studies. *The Tax Burden on Tobacco*[36] provides the annual tax, sales data and retail price for every state and the US nationally. This data were inflated to 2002 dollars using the CPI.[37] Figure 1 depicts the ratio of the real tax (federal and state) to the real California retail price, in 2002 dollars, from 1970 to 2002. This ratio indicates the percent of the retail price that is paid in taxes and thus can be avoided by smuggling. A higher ratio indicates a greater incentive to smuggle. One point that is immediately clear form Figure 1: Despite the fact that cigarette taxes increased over time, the incentive for smuggling cigarettes in California in 2003 is about what it has been since about 1990 and is much lower than it was in the 1970s.

Figure 1: Ratio of Total Tax to Real Price for California from 1970 - 2002
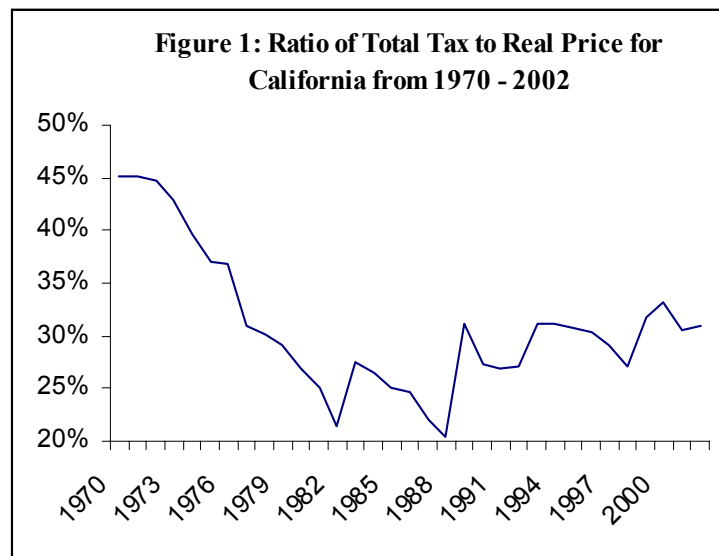
In 1970 taxes represented over 45% of the retail price of cigarettes. Consumers could then hope to reduce their cost of smoking by up to 45% by individual bootlegging and organized wholesale smugglers could expect to achieve a profit margin of up to 45%. This percentage decreased throughout the 1970s and 1980s hitting a low of 20% in 1988 because the excise tax stayed constant while the retail price increased. In 1989 California raised the excise tax because the voters passed Proposition 99 in 1988 and the ratio jumped back to 31%, only to fall again until the excise tax was raised to its current level in

1999. Currently the excise tax of $0.87 represents 31% of the retail price. This means that there is actually a lower incentive to smuggle today than there was from 1970-1976.

The average tax-to-price ratio from 1970-2002 was 31%. Since the current level of 31% is at the twenty-three year average of 31% and far below the levels that of the early 1970s, for the BOE estimate to be accurate, the level of smuggling today would be significantly below that of early 1970s. All the other studies discussed earlier showed consistently however that only 2% to 6% of cigarettes were smuggled during that time (Table 1). While these estimates did not include international smuggling, it seems implausible that over 21% (27% from the BOE estimate[11] less 6% domestic smuggling) of the cigarettes in California have been smuggled internationally for the last 30 years.

Is California Different?

A possible explanation for the high BOE estimates is that California is fundamentally different from the rest of the nation and more domestic smuggling occurs in California than the 3.3% to 6% national averages. If this were the case, then changes in the California tax rate would cause greater changes in tax paid cigarette sales than changes in the federal rate. Individual bootleggers and organized smugglers typically pay the federal tax and the tax in another lower tax state (e.g., Virginia) then ship the cigarettes to California. Since changes in the federal tax will affect all the states equally, increases in the federal tax will not cause increases in domestic smuggling. If an increase in the California tax affected the amount of domestic smuggling, however; that would be reflected in a change in the level of California tax paid sales.

Economists measure how sales of a product changes when prices change using "elasticity," which is the percentage change in sales divided by the percentage change in price. For example, the price elasticity for cigarettes is approximately -0.4, which means that there is a 4% reduction in consumption for every 10% increase in price (-4% / 10% = -0.4). Likewise, the elasticity of California tax paid sales to California state tax is equal to the ratio of the percentage change in California tax paid sales to the percentage change in California state tax and the elasticity of California tax paid sales to the federal tax is the ratio of the percentage change in California tax paid sales to the percentage change in the federal tax. If increasing state cigarette taxes does not affect smuggling, the tax elasticities for state and federal tax increase will be equal to the ratio of the state-to-federal taxes, because both would lead to the same price increase and reduction in cigarette consumption. (See the Appendix for proof.) If, on the other hand, increases in state tax led to increase smuggling, the tax elasticity estimated for taxable cigarettes sales in California would be artificially increased, because there would be a greater drop in taxable sales than predicted by the price increase as people increase their consumption of smuggled (untaxed) cigarettes, Increasing the ratio of the elasticities of state-to-federal taxes. This fact provides a way to test if California tax increases are associated with increases in smuggling.

These tax elasticities can be estimated simultaneously by fitting an equation,[*] to the data on taxable cigarette sales and federal and states taxes in California from 1970 to 2002. We used data from all years from 1970 to 2002 from *The Tax Burden on Tobacco* [36] (In 2002 dollars using the CPI)[37] for tax paid sales, California state tax and the federal tax to estimate these elasticities. The specification controls for the general decrease in cigarette consumption by use of the time variable. The results of the analysis are shown in Table 2.

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[*] $\ln(TaxPaidSales) = \alpha + \eta_{StateTax} \ln(StateTax) + \eta_{FederalTax} \ln(FederalTax) + \beta_{Time} Time$

in which α is a constant, $\eta_{statetax}$ is the estimate of state tax elasticity, $\eta_{Federaltax}$ is the estimate of federal tax elasticity and β_{Time} is the effect of time to control for the general decrease in smoking.

Table 2. Estimated Coefficients from Regression on
California Tax Paid Sales

Variable	Estimate	Prob.
State Tax Elasticity	-0.19	<0.001
Federal Tax Elasticity	-0.22	<0.001
Time	-0.02	<0.001
Intercept	40.72	<0.001
R^2	0.96	

Note: A Wald test of the relationship State Tax
Elasticity= 1.4 x Federal Tax Elasticity, as derived in the
Appendix, did not reject this relationship with p=0.17.

The estimated state tax elasticity is -0.19 and the estimated federal tax elasticity is -0.22. As explained in the Appendix, for large scale domestic smuggling to occur, the state tax elasticity would necessarily by greater than 1.4 times the federal tax elasticity (1.4 is the average ratio of the California state tax to the federal tax between 1970 and 2002). The fact that the estimated state tax elasticity is lower than the estimate federal tax elasticity (rather than larger, as the ratio would predict), makes it even more improbable that the state tax elasticity is statistically significantly higher than 1.4 times the federal tax elasticity. It does not appear that California tax changes have been associated with massive increases in smuggling, as the BOE suggests.[10, 11]

A New Estimate of Smuggling in California

The ratio of total state and federal tax to retail price, as discussed above, is a measure of the incentive for all types of smuggling. Thus an analysis of cigarette demand in California, using the ratio of total tax-to-price as a predictor of smuggling will provide a reasonable estimate of the level of smuggling in California.

The ratio of total tax-to-retail price was calculated with real prices and total federal and state taxes for California from 1970 through 2002. The nominal prices were taken from the *Tax Burden on Tobacco*[36] which were inflated to 2002 using the CPI[37] and used to estimate the elasticity of tax paid sales to the ratio of tax to retail price.* The retail price in California is used to both control for the change in price and used to evaluate the regression model, as price elasticities for cigarettes have been established,[3, 4, 7, 9] and an estimated elasticity similar those previously established would increase confidence that the model used is appropriate. To allow for the effect of the California Tobacco Control Program that was created by Proposition 99 and implemented beginning in 1989, a variable was set equal to zero for 1970-1988, 1 for 1989 and was increased by 1 each year from 1990-2002. This variable allows for the cumulative effect of the Tobacco Control Program.[33] Time is also included in the model to control for other factors and the long-term decline in smoking that predated the program. Total tax was used in the calculation of profit margin instead of just California tax in order to capture the incentive for both interstate and international smuggling. (We also did the analysis for just the California tax with no material differences in the results.)

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* $\ln(Sales) = \eta_{Price} \ln(Price) + \eta_{Tax/Price} \ln(Tax / Price) + \beta_{Program} TobaccoControl \, Program + \beta_{Year} \ln(Year)$

Table 3. Estimates from Regression on California Tax Paid Sales

Variable	Estimate	Prob.
Tax-to-Price Ratio	-0.14	0.016
California Retail Price Elasticity	-0.43	<0.001
Year	1.31	<0.001
Tobacco Control Program	-0.17	<0.001
R^2		0.94

The results of the analysis are shown in Table 3. The price elasticity (the estimated coefficient on price, η_{Price}) estimate of   -0.43 is similar to with other published price elasticity estimates.[3] (The price elasticity estimated here differs from the tax elasticities estimated earlier, because they are based on different percentage changes; the tax elasticities estimated are based on the percentage change in the tax, the $0.50 increase in 1999 was a 135% increase in the tax (0.50/0.37), while the price elasticity estimate here is based on percentage increase in price (the $0.50 tax increase represented only 14% of the $3.51 1999 retail price of cigarettes).) The estimated elasticity for the ratio of tax to price of -0.14 indicates that a 1% change in the ratio will decrease California taxable sales by 0.14%. For example, the 1999 California excise tax increase from $0.37 to $0.87 per pack caused the ratio of tax to retail price to increase from 27% to 32%, an increase of 15%. The 15% increase implies that there was a 2% (15% x -.14) drop in tax paid sales due to increased smuggling in 1999.

Additionally, the estimated effect of the Tobacco Control Program was -0.17 which indicates that the program had a significant effect on cigarette consumption. Using the -0.17 program effect, we estimated that over 13% of the drop in tax paid sales from 1999 to 2002 was due to the Tobacco Control Program. The 13% drop in tax paid sales means that 39 million packs of cigarettes were not smoked in California (which cost the tobacco industry over $1.5 billion in revenues over the period) due to the Tobacco Control Program. This large effect was completely ignored by the BOE estimates. The BOE assumes that the $34 million ($0.87 x 39 million packs) drop in tax revenue was all due to increased smuggling, not the Tobacco Control Program.

Changes in Smuggling in California Since 1999

The estimated tax-to-price elasticity for tax paid sales calculates changes in smuggling, thus it is possible to calculate changes in smuggling that occurred from specific tax increases. The BOE has attributed their estimate of $292 million of lost excise tax revenue in 2001 to the 1999 California excise tax increase from $0.37 to $0.87.[11] The BOE argues that the large percentage change in the tax significantly increased the incentive to smuggle. While the tax increase did increase the incentive to smuggle, as shown in Figure 1, the current incentive is still well below that of the early 1970s and at the 23 year average, when there was not widespread public clamor about smuggling.

The elasticity for the tax-to-price ratio estimated above can be used to calculate an estimate of the level of smuggling. Table 4 calculates the annual change in lost excise tax revenue due to the 1999 increase in the California excise tax, based upon the tax-to-price elasticity estimated above. The annual change in sales is calculated by multiplying the price to tax elasticity of -0.14 by the annual percentage change in the tax-to-price ratio. The percent change in sales is then multiplied by the tax paid sales in the previous year to determine the change in tax paid sales due to the change in the tax-to-price ratio. This change in tax paid sales due to the change in the tax-to-price ratio represents the change in the level of smuggling in any given year.

Table 4. Calculation of Lost Excise Tax Revenue Due to
Proposition 99 $0.50 Increase in the Excise Tax

Year	Sales (millions of packs)	Tax to Price Ratio	% Change in Ratio	% Change in Sales	Change in Lost Sales	Change in Packs Smuggled Since 1999 (millions)	Revenue Lost (millions)	% of Total Revenue
1999	1523.0	31.7%	14.7%	-2.1%	34.28	34.3	$ 30	2.3%
2000	1352.7	33.2%	4.8%	-0.7%	10.16	44.4	$ 39	3.3%
2001	1287.6	30.4%	-9.2%	1.3%	-17.42	27.0	$ 24	2.1%
2002	1234.9	30.9%	1.4%	-0.2%	2.55	29.6	$ 26	2.4%

Since the BOE attributes the bulk of their smuggling estimate of 27% to the Proposition 10 tax increase, to calculate the total increase in smuggling since the tax increase, we set the level of smuggling in 1998 to zero, in order to make the to estimates comparable. The negative percent change in the tax to price ratio for 2001 of -9.2% implies that smuggling *decreased* from 2000 to 2001 while in all other years smuggling increased. These calculations show that in 2002, California only lost an estimated $26 million in excise tax revenue due to smuggling.[*]

California collected close to $1.1 billion in 2002 in tobacco taxes. The $26 million of estimated lost revenue due to taxes is equal to 2.4%. The highest level of smuggling as a percentage of total revenue was in 2000 at 3.3%. These results are much lower than those of the BOE, and generally consistent with those of the other studies discussed above.

The Tobacco Industry's Use of Tax Increases to Mask Price Increases

The tobacco industry consistently argues that increasing cigarette taxes unfairly targets the poor. Despite this rhetoric, cigarette companies have used tax increases to obscure the fact that they are constantly increasing wholesale prices to boost company profits.

The tobacco industry has long understood the impact that increased taxes can have on their bottom line. In 1982, Myron Johnston, an economist hired by Philip Morris, advised the company that the public in the short run, is much more sensitive to highly publicized tax increases than general wholesale price increases. During the period surrounding a proposed tax increase, consumers may have difficulty determining what proportion of the ultimate retail price increase was due to the tax. Johnston writes:

> *When the industry raises prices the consumer is generally unaware of the fact – only the distributors know for sure. However, when the price increase is caused by a tax increase, the fact is well publicized. This led me to a state-by- state analysis of the effect of tax increases on cigarette sales, and my conclusion is that a well publicized price increase yields a short-term elasticity of about –0.2 and a long-term elasticity that approaches zero. I also found that elasticity has declined over time. What I found was that, not surprisingly, per capita sales increase sharply just before the tax increase as people stock up at the pre-increase price, then drop sharply as people use up their hoarded supplies and, perhaps, try to use the price increase as an added incentive to quit smoking.[38]*

Philip Morris, in 1982, used floor tax protection – a tool to encourage customers to buy large quantities of cigarettes immediately before the effective tax date -- as a strategy to increase the sales while the wholesale price reflected the tax, but the tax had not gone into effect. Such plans offered limited, temporary bonus payments to distributors who increased the volume of their purchases, as well as small discounts to offset federal taxes on year-end inventories.[39] These discounts served to partially offset the

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[*] The 95% confidence interval for the point estimate of -0.14 is -0.04 to -0.24. Using these estimates in the calculations in Table 4, provides a 95% confidence interval for lost excise tax revenue in 2002 of $7 million to $45 million (95% CI 1% to 4.2% of total revenue collected).

wholesale price increases. A 1990 Philip Morris memo from Stephen Piskor, Vice President of marketing at Philip Morris, to HG Steele, an executive at Philip Morris, discusses the company's 1982 floor tax protection program and cigarette price increases and addresses alternatives for a proposed FET increase in 1990:

> *In 1982, PM-USA offered the Trade* [wholesalers and distributors] *a credit memo for one-half week of average purchases at $4.00/M* [/M=per thousand cigarettes] *to cover the impact of the FET increase on the trade. This was considered a necessary inducement since manufacturers had begun to phase-in the FET increase with a series of price increases prior to the effective date of the tax. Thus, if wholesalers were unable to push units bought during the phase-in period out of retail, they would lose money due to the floor tax."*[39] [emphasis added]

The floor tax program worked as a discount to wholesalers and distributors while PM-USA increased the wholesale price of cigarettes ahead of the tax increase. High volume wholesalers and distributors received discounts in form of cash payments and below market interest rates. While these discounts lessened the impact of the wholesale price increases on the distributors, PM-USA was still rapidly increasing the wholesale price above and beyond the discounts offered to the distributors and wholesalers.[39] The effect of this was to allow the tobacco industry to raise prices ahead of the tax increase, and still give distributors the ability to delay the price increase into the future. The floor tax memo suggests that for an $8 increase per thousand cigarettes in the FET, with a $4 credit/discount to distributors, there should be a "total price increase of $10.50 ($8.00 FET and $2.50 price increase)."[39] This suggestion in the floor tax memo indicates that in the case of an $8.00 per thousand cigarette tax, PM-USA would plan on passing on a price increase of $10.50 to consumers, over 130% of the tax.

A September 3, 1987 memo from PM-USA economist Myron Johnston to Jon Zoler, Director of Marketing Research at Philip Morris, titled "Handling an Excise Tax Increase" outlines how a single price increase that included the increased tax, is superior to the gradual increases used in 1982.

> *I have been asked for my views as to how we should pass on the price increase in the excise tax. My choice is to…pass on the increase in one fell swoop and make it clear to smokers that the government is solely responsible for the price increase, advertise to that effect, suggest that people stock up to avoid the price increase, and recommend that they refrigerate their cigarettes to 'preserve their freshness.' (It would be necessary to emphasize that point or we would get a lot of beetle complaints.)* [Beetle complaints are complaints from consumers regarding the bugs in the cigarettes that increase the longer cigarettes are on the shelf.] *Then when people exhaust their supply and go to the store to buy more, they will be less likely to remember what they last paid and will be less likely to suffer 'sticker shock.' As a result, they should be less likely to use the price increase as an incentive to stop smoking or reduce their consumption.*
> *…*
> *Last time, of course, we increased prices five times between February of 1982 and January of 1983. In less than a year the price went from $20.20 to $26.90 per thousand ($2.70 more than the tax), and this fact was not lost on consumers, who could legitimately blame the manufacturers for the price increases...We don't need to have that happen again.* [40] [emphasis added]

While it is unknown whether this "one fell swoop" strategy that included a price increase over and above the tax was specifically implemented or not, it does document that when the FET was increased by $4 in 1983 (from $4 per thousand cigarettes to $8 per thousand cigarettes), PM-USA passed on a price increase to consumers of $6.70,[40] 167% of the tax.

Tobacco Industry Price Increases Over and Above Tax Increases

The documents discussed above make clear that the tobacco industry had planned to use tax increases to mask wholesale price increases. Using data from *The Tax Burden on Tobacco*,[36] we examined all of the state level tax changes within the entire United States from 1981 through 2000. The real price change, excluding real federal taxes, in the two years after the change in tax (inflated to 2002 dollars using the all urban CPI published by the Bureau of Labor Statistics[37]) was related to the tax change, the year of the tax change (to control for the effects of time) and a variable to quantify the effect of the Master Settlement Agreement in 1999, to account for the fact that the tobacco industry significantly increased the wholesale price of cigarettes after the MSA to pass for the cost of the payments it had to make to the states along to smokers.

The data in the *Tax Burden on Tobacco* are reported in fiscal years (July to June) as opposed to calender years (January to December). The vast majority of the tax changes, however, go into effect at the beginning of the calender year. To capture all changes in retail price, following a tax increase, the sum of the changes in the retail price from the year of the tax increase and the year following the tax increase is used as the total change in the retail price. For example, the tax in California increased on January 1, 1999 from $0.37 to $0.87. Because the price reported by the *Tax Burden on Tobacco* for 1999 is the average price from July 1, 1998 to June 30, 1999, this price only includes six months that included the tax. Thus, to see the full effect of this increase for 1999 and any resulting increases for the first six months of 2000, the price change for both 1999 and 2000 are necessary. The results of this analysis are shown in Table 5.[*]

Table 5. Estimated Effects of a Change in Tax on the Price of Cigarettes

Variable	Estimate	Prob.
Tax Change	1.50	<0.001
Year (¢/year)	1.12	0.007
Master Settlement Agreement (¢)	115.74	<0.001
Intercept (¢)	15.67	<0.001
R^2	0.75	

The estimated coefficient on the tax change of 1.5, shows that the industry on average increases prices by 150% the amount of any increased tax. Figure 2 shows that in almost all cases the tobacco company increased prices by more than the tax increase. (Had the industry simply passed on the tax increase without increasing wholesale prices, the data would have fallen along the dashed line in Figure 2 (slope = 1)). The passing on of 150% of the tax in two years reinforces the discussion above that the industry is merely using rhetoric about protecting poor people to lobby against tax increases. All the while, they are increasing its profits from these people and blaming the government. The industry tells consumers that increased taxes are bad for them and that the industry is fighting for them, but in fact, the industry just uses the tax increase as a mechanism to further increase wholesale prices.

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[*] $PriceChange = C + \beta_{TaxChange} TaxChange + \beta_{Year} Year + \beta_{MSA} MasterSettlementAgreement$

**Figure 2: Change in real excise taxes
vs. change in real retail price**
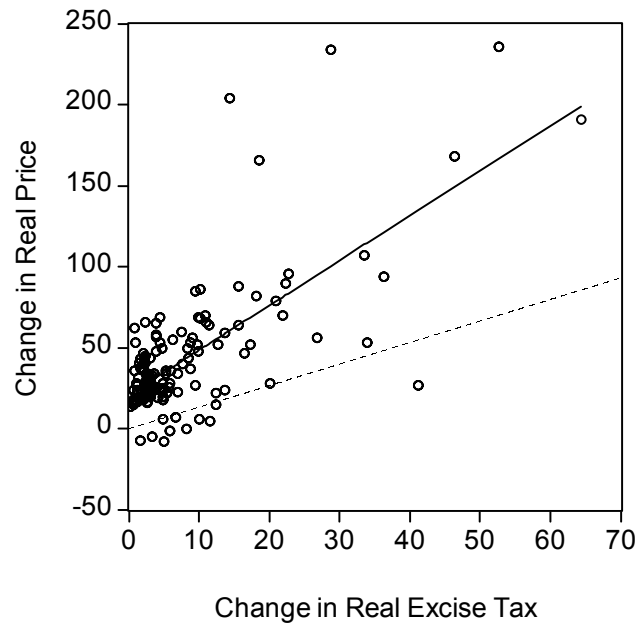
The estimated effect of the Master Settlement Agreement, β_{MSA} was 115.74 ¢. The effect of the MSA indicates that there was a wholesale price increase of $1.16 associated with the MSA. While, the estimated increase of $1.15 is preliminary, as the study was not designed specifically to measure the effects of the Master Settlement Agreement, it does follow the pattern to the state level tax increases that were passed on to consumers. The Master Settlement Agreement included annual payments to the states based on cigarette sales. In 1999, the tobacco industry sold approximately 21 billion packs of cigarettes[36] and made payments equal to $4 billion due to the MSA and previous settlements with Mississippi, Florida, Texas and Minnesota.[41] The payments made by the tobacco industry were equal to $0.19 per pack ($4 billion / 21 billion packs). Thus if the $1.16 increase is a correct estimate, then the tobacco industry passed 605% of the cost of the MSA and other state settlements on to consumers.

Conclusion

The importance of identifying the correct level of smuggling associated with any tax increase is important, not just to identify the level of revenue that a new tax will bring into the state, but to estimate the true health benefits of any increase in the tax.

Previous estimates the extra revenue generated for California general fund if the excise was increased by $2.13 or $1.50, both including a $0.20 earmark for tobacco control programs[42] as well as the same calculations for a $0.50 tax increase, also with a $0.20 earmark are shown in Table 6. These estimates are based on elasticities that were estimated using data on tax paid sales, and as such, already include whatever smuggling exists.[42] While it is true that increased taxes will marginally increase smuggling, as the table illustrates, the state will still experience significant increases in revenue from any tax increase.

Table 6. Revenue Added to the General Fund by Increased
Cigarette Excise Taxes

Tax Increase	Increase in State Revenues ($millions)
$2.13	$1,590
$1.50	$ 806
$0.50	$ 267

To fight tax increases, the tobacco industry exaggerates smuggling claims and work cooperatively to create the perception of grassroots opposition to any tax increase. The claims made on smuggling are typically based upon erroneous comparisons with levels of international smuggling (that the industry supports), particularly Canada, with interstate smuggling in the US. Once excise tax increases are passed and enacted, the tobacco industry uses it as an opportunity to raise wholesale prices. The taxes enables them to blame the government for any price increase, while they pass on an estimated 150% of any tax increase to consumers in the form of higher retail prices.

The industry's claims appear to be bolstered by the California Board of Equalization's very high estimate for lost revenue due to smuggling in CA of $292 million, 27% of total revenue. This estimate is based upon a badly biased and unscientific sampling of retailers. A more reasonable estimate of between $7 million and $45 million lost revenue or 1% to 4.2% of total revenue is in line with previously published estimates of cigarette smuggling in the US. This "loss" is much less than the increase in revenue actually generated by any of the tax increases and no reason not to increase state cigarettes excise taxes.

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Appendix

1999 BOE Report

The ACIR[2] study calculated the expected value of the effect of price on tax cigarette sales. The expected effect is calculated by manipulation of the price elasticity formula and established estimates of the price elasticity of cigarettes. The expected effect can be calculated as:

$$\beta = elasticity * (quantity / price)$$

The ACIR report used a price elasticity, -0.34, per capita sales of 131.2 packs (the mean of the sample of US per capita sales over the period 1981-1983) and price equal to 70.8 cents (the mean of the sample of US prices over the period 1981-1983) to determine the expected coefficient of -0.63.[2] The -0.63 estimate means that a 1 cent increase in the price would decrease per capita sales by 0.63 packs.

The ACIR estimated value of the effect of price on sales using their regression analysis to be -0.8455.   The ratio of the expected coefficient to the estimated coefficient is 0.75 (-.63/-0.8455). The ACIR report reaches the conclusion that the expected coefficient on price explains 75% of the variation in sales that they estimated was due to price, and the remaining 25% is due to smuggling. The BOE used the 25% of the estimated change in tax paid sales due to the increased tax as the estimate of smuggled cigarettes.

Also, as noted above, the 25% is calculated with a price elasticity of -0.34. While this is within the range of estimated elasticities, it is on the low end of the estimated elasticities in the studies cited above (-0.26, -0.78).[3, 4, 7, 9] Performing the same calculation but using a price elasticity of -0.4 would cut the estimate of unexplained drop in consumption in half to 13% of any drop in consumption.

Is California Different?

The tax elasticities estimated are for different taxes, thus it is important to insure that they are readily comparable. To see the comparability, first examine the definitions for the tax elasticities $\eta_{statetax}$ and $\eta_{federaltax}$.

$$\eta_{statetax} = \frac{\frac{\partial S}{S}}{\frac{\partial C}{C}}$$

and

$$\eta_{federaltax} = \frac{\frac{\partial S}{S}}{\frac{\partial F}{F}}$$

In which S is tax paid sales, C is the California state tax and F is the federal tax. Assume then that cigarette companies increase prices by the same level for both state and federal taxes.

$$\partial F = \partial C = \gamma \partial P$$

In which γ is the constant multiplier of any change in tax that is passed on to the price, P. Substituting this relationship into the definitions for $\eta_{statetax}$ and $\eta_{federaltax}$ shows that:

$$\eta_{statetax} = \left. \frac{\partial S}{S} \middle/ \frac{\gamma \partial P}{C} \right. = \frac{\partial S}{\gamma \partial P} \frac{C}{S}$$

and

$$\eta_{federaltax} = \left. \frac{\partial S}{S} \middle/ \frac{\gamma \partial P}{F} \right. = \frac{\partial S}{\gamma \partial P} \frac{F}{S}$$

The ratio of $\eta_{statetax}$ and $\eta_{federaltax}$ is then:

$$\frac{\eta_{statetax}}{\eta_{federaltax}} = \frac{\dfrac{\partial S}{\gamma \partial P} \dfrac{C}{S}}{\dfrac{\partial S}{\gamma \partial P} \dfrac{F}{S}} = \frac{C}{F}$$

The ratio of the estimated elasticities for the state and federal tax, in the absence of smuggling, should then be equal to the ratio of the state tax to the federal tax. Figure A1 depicts this ratio over the sample period of 1970 to 2002 and shows that is averaged 1.4.[*]

Figure A1 - Ratio of California State Tax to Federal Tax from 1970 - 2002
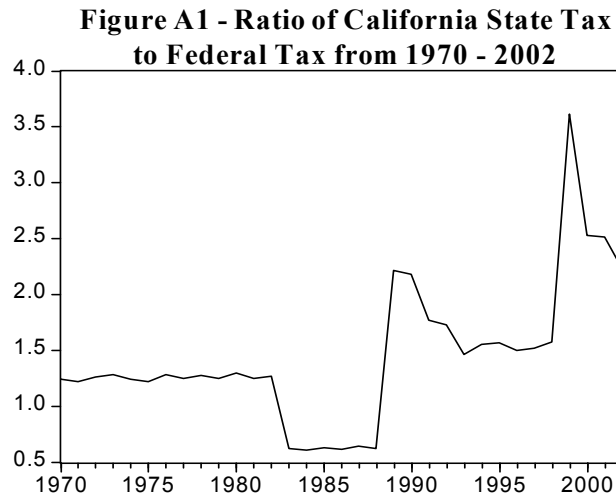
$$\eta_{statetax} = 1.4 \eta_{federaltax}$$

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[*] We controlled for the effects of time by adding dummy variables for various time periods. These variables did not have any material effect on the results are were thus omitted.