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Targeted Enforcement against Illicit Trade in Tobacco Products

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Abstract

Illicit trade in tobacco is a substantial and growing problem in the U.S., causing loss of tax revenue, damage to public health, and threats to public safety. Decisions about enforcement against ITTP involve tradeoffs among competing objectives. Good policy design can improve the terms of those tradeoffs but cannot eliminate them. We examine questions about the allocation of enforcement resources against ITTP, and its distribution across activities, individuals, and organizations: in particular, whether and how to differentially target ITTP that involves violence or support for terrorism. We consider the problem of developing effective strategies for enforcement, applying both lessons from experience with markets for illicit drugs and theoretical insights about enforcement targeting and dynamic concentration. We show that targeted enforcement and focused deterrence are more efficient than unfocused enforcement, and that – when other policy changes increase the potential rewards to illicit activity – enforcement resources applied earlier (before illicit markets have grown) will have greater impact than enforcement resources applied later (and therefore to larger markets). We discuss additional considerations, ranging from real-world complications left out of the simple models to examination of how insights from behavioral law and economics may modify conclusions based on a theory of deterrence designed for *homo economicus*.

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I. Introduction

Illicit trade in tobacco products (ITTP) in the U.S. is a substantial and growing economic activity. Estimates vary due to the nature of the market, but ITTP appears to have a national market share in the range of 3.9% to 8.5%.¹ That represents roughly 10 to 25 billion cigarettes illicitly traded, leading to lost cigarette excise taxes of about \$3B in states that are net importers of illicit cigarettes (Euromonitor, 2016; Reuter and Majmundar, 2015). Most ITTP in the U.S. takes the form of smuggling genuine name-brand products from lower-tax to higher-tax jurisdictions. ITTP threatens health both by reducing the effective price of cigarettes (compared to fully taxed product), leading to more smoking (including more initiation among youth) and thus greater smoking-related health damage, and by creating a disincentive for jurisdictions to raise taxes.² ITTP itself creates additional harms: loss of excise and sales tax revenue and the violence that sometimes attends trade in illicit markets (Kulick, Prieger, and Kleiman, 2016). Additionally, some ITTP has been found to fund terrorist organizations overseas (Reuter and Majmundar, 2015; Sanderson, 2004; Shelley and Melzer, 2008; U.S. Dept. of State, 2015). Given that the potential profits from ITTP can be large and the risk to perpetrators from successful enforcement is relatively low, ITTP can be expected to grow (and appears to have been growing). To date, enforcement against ITTP in the U.S. has not succeeded in quashing the trade or preventing its growth. Increased enforcement would be costly; in addition, enforcement can have unwanted consequences of its own such as stimulating illicit revenue and violence (Prieger and Kulick, 2014, 2015). Thus, indiscriminate ramping-up of enforcement efforts is likely not the best strategy, and a careful look at alternatives is warranted.

ITTP is enabled by high taxes on tobacco, large differences in excise taxes among the states, and—currently to a much lesser extent—product restrictions. The federal excise tax on cigarettes is \$1 per pack. State excise taxes range from \$0.17 per pack in Missouri to \$4.35 in New York. Local taxes sometimes push excise taxes even higher: New York City levies an additional \$1.50 per pack.³ In 2014, federal and state excise taxes accounted for an average of 43.8 percent of the retail price of cigarettes (Orzechowski and Walker, 2014; see also Figure 2 discussed below). In New York, taxes can account for about three-fifths of the final retail price.⁴ Any local or state sales taxes also apply to cigarettes. The great variance among state and local excise taxes drives much of the ITTP in the U.S. The difference in taxes between Virginia and New York City amounts to \$55.50 per carton of cigarettes, a differential which supports a sizeable Virginia-to-New York smuggling trade (Green, 2012). As stricter controls and higher taxes on cigarettes are implemented, economic analysis as well as historical evidence from this

¹ The estimates are discussed in the next section.

² A large empirical literature finds that tobacco taxes and prices, tax differentials among jurisdictions, and factors such as the consumer's distance to lower-tax areas are all related to smuggling and bootlegging in the U.S. (Baltagi & Levin, 1986; Saba et al., 1995; Galbraith & Kaiserman, 1997; Thursby & Thursby, 2000; Stehr, 2005; Chiou & Muehlegger, 2008; Goel, 2008; Lovenheim, 2008; DeCicca, Kenkel, & Liu, 2013).

³ See www.ttb.gov/main_pages/schip-summary.shtml for the federal excise rate. State rates are from the Federation of Tax Administrators, current as of the beginning of 2016, and are available at www.taxadmin.org/assets/docs/Research/Rates/cigarette.pdf.

⁴ Data from Weaver (2015) show that of the \$10.58 price for a pack of Marlboros at a gas station convenience store in upstate New York, 58% went to federal and state excise taxes and state and local sales taxes.

and other markets suggest that unless countermeasures are taken—and probably despite them—we should expect to see an expansion of tobacco smuggling, tax avoidance, and counterfeiting of tax stamps.

The multiplicity of potential goals and evaluative dimensions—promoting public health, protecting tax revenue, suppressing violence, cutting off financing for terrorism, maintaining public order and the rule of law, fostering respect for government and removing possibilities for corruption, and improving relations between police and communities – creates difficulties for policy directed at ITTP. Some of these goals work at cross-purposes to one another; promoting public health by taxing tobacco makes achieving the other goals more difficult. However, efficient enforcement strategies can improve the terms of the tradeoffs involved.

In this paper we examine options to combat ITTP and the related violence and funding for terrorist activity. Three approaches – not necessarily mutually exclusive – are discussed: addressing ITTP in general, targeting enforcement against ITTP-related violence, and targeting enforcement against ITTP that funds terrorism. The same means do not serve all three ends equally, and some goals are likely more feasible to achieve than others. There are lessons to be learned from experience with other illicit markets, most notably those for illicit drugs, and insights to be applied from theories of enforcement swamping and dynamic concentration.

In section II, background information on ITTP, violence, and terrorism is presented, along with discussion of how recent and likely future regulation may increase the scale of ITTP and its consequences. Section III contains the three alternative approaches: general suppression of ITTP, deterrence focused on violence, and deterrence focused on ITTP-enabled funding for terrorism. Aspects of “pulling levers,” a particular form of “focused deterrence” that has met with success in reducing gun crime in drug markets, are discussed and applied to ITTP. The discussion of targeted enforcement and focused deterrence encompasses both theoretical and practical aspects. In section IV, a number of additional considerations that would impinge on the success of efforts to combat ITTP are discussed. Some basic ideas may seem promising but not always work as predicted from theory alone. Such considerations range from real-world complications left out of the simple models to examination of how insights from behavioral law and economics may reinforce or obviate a crime intervention based on a theory of deterrence designed for *homo economicus*. In the final section, we summarize the pros and cons of the various approaches and tentatively conclude that deterrence focused against violence is a promising strategy. Avenues for future research are also discussed.

II. Policy Setting

This section briefly reviews the current state of ITTP in the U.S., existing efforts to combat it, and potential upcoming action from federal policymakers that might increase its scale.

A. Background on ITTP, violence, and links to terrorism

1. ITTP in the U.S.

ITTP takes several forms.⁵ Most common in the U.S. is the smuggling of genuine cigarettes from lower-tax to higher-tax jurisdictions, whether by criminal operators or by consumers' casual bootlegging. Smuggled cigarettes generally come from superficially (and sometimes genuinely) lawful wholesalers and retailers, not from overseas drug traffickers. Purchasers masquerading as legitimate consumers or retailers buy in bulk (Green, 2015c). Those purchasers may themselves be smugglers or they may sell to smugglers, who then send the goods to higher-taxed states, either in personal vehicles or by common carrier, and dispose of them to scofflaw shopkeepers and street sellers. Some of those smuggling operations constitute substantial-scale criminal enterprises, but given the easy availability of products in low-tax states the whole process is nowhere nearly as complex as smuggling controlled drugs from Mexico or growing or manufacturing them domestically. Much less common in the U.S. are "cheap whites" (brands produced solely for black market sales)⁶ and counterfeit product. While as recently as 2003, 44% of commodities seized at the national borders were counterfeit cigarettes (GAO, 2004), by 2013 that figure had fallen to 1% (DHS, 2014).

Data from one widely cited source (Euromonitor International, 2016) implies that untaxed or counterfeit product accounted for 3.9% of the trade volume of cigarettes in the U.S. in 2015 (see Figure 1), or 10.8 billion cigarettes. Estimates from other sources are higher. A report from the National Research Council estimates (as a lower bound) that 8.5% of cigarette sales (24.8 billion sticks) were subject to tax evasion and avoidance in 2010-2011 (Reuter and Majmundar, 2015). The same report discusses high-end estimates of about 21% market share (58.2 billion sticks).

The Euromonitor data in Figure 1 suggest that illicit trade in cigarettes as a share of all retail trade grew during 2000 to 2004 and more recently from 2008 through 2014.⁷ Presently, by Euromonitor estimates, ITTP encompasses about one out of every 26 cigarettes sold. ITTP varies widely by state, in part since tobacco taxes vary widely. The actual scale of ITTP can only be roughly estimated, and we found no estimates of smuggling at the state level published in peer-reviewed journals. LaFaive and Nesbit (2013) report that over half of cigarettes smoked in New York, Arizona, and New Mexico are smuggled, and that Virginia, Delaware, West Virginia, Missouri, and Wyoming had estimated net total smuggling exports that exceeded 10% of total state consumption. Reuter and Majmundar (2015) independently estimate that 45% of cigarettes consumed in New York State are subject to tax avoidance and evasion.

2. Violence

With illicit trade comes the potential for organized crime and violence, but illicit markets vary widely along both dimensions: the U.S. retail crack trade was exceptionally violent during the 1980s, while the

⁵ This section draws heavily upon Kulick, Prieger, and Kleiman (2016).

⁶ "Cheap whites" are cigarettes produced independently of the traditional tobacco manufacturers solely for the purpose of untaxed sales. As opposed to counterfeit product, cheap whites are sold under their own brands.

⁷ Euromonitor revises its estimates each year in July based on new information. The counterpart to Figure 1 using the estimates as of July 2014 display the same trend but much higher levels (see Figure 1 of Kulick et al., 2016), making the previous estimates more in line with that of the National Research Council (Reuter and Majmundar, 2015).

market for MDMA (“Ecstasy”) experiences little violence. Illicit drug markets have proven to be particularly susceptible to violence (Andreas and Wallman, 2009; Goldstein, 1985). Some violence in and around illicit markets stems from calculation: participants may shoot competitors to gain or protect market share, customers to collect on business debt, suppliers to retaliate for having been cheated, employees to punish theft, or potential witnesses to prevent testimony (Goldstein, 1989; Reuter, 2009, Caulkins et al. 2010; Kleiman, 2011).

But, at least in U.S. retail drug markets, detailed examination of homicides classified as “drug-related” by police turn up more evidence of stemming from robbery or interpersonal disputes – romantic rivalries, reactions to perceived affronts – than of directly “business-related” reasons.⁸ Here the link to between violence and illicit markets runs through the perceived need of market participants for self-protection from potential robbers. Robberies of drug dealers, a common occurrence (Jackall, 1997), are often triggered by expectations that dealers have large amounts of cash or valuable product on their person, and are further encouraged by the reluctance of the illicit-market-involved victims to call the police (Goldstein, 1985). Once dealers are armed to protect themselves from robbery (and with their purchases of weapons financed from illicit-market revenue), they become potential sources of deadly violence. Furthermore, participants in illicit drug markets are often pre-disposed to violence because they tend to be recruited from communities with above-average rates of violent crime (Moeller and Hesse, 2013).

Moreover, open-air markets with multiple sellers and buyers create many opportunities for social interaction, including opportunities for interpersonal disputes, typically among young men living in a “code of the streets” culture where a reputation for dangerousness has both prestige and practical value (Topalli, Wright, & Fornango, 2002). Those perceived as less dangerous must either defer to those perceived as more dangerous – thus setting themselves up as targets for repeated slights and aggressions – or take steps (such as becoming armed) to put themselves on a footing of equality (Jacobs, Topalli, and Wright, 2000).

Even those not engaged in illicit trade themselves, or those engaged as buyers rather than sellers, may experience pressure to arm themselves to avoid subordination. In the resulting social setting, what would otherwise be routine disputes resulting in no more than an exchange of insults or fisticuffs have a heightened risk of turning deadly. In that context, some violence without a direct business motive may nevertheless stem from a rational calculus: failure to respond to a public affront with deadly violence may be read as a sign of weakness, with potentially lethal consequences to the perceived weakling (Jacobs, Topalli, and Wright, 2000). That can feed back into purely business-related violence; an unpaid debt, for example is the sort of affront that cannot be safely tolerated in heavily-armed street culture.

Thus flagrant drug markets – where strangers meet in public spaces, or where strangers come to buy from dedicated drug-dealing locations such as crack houses – create circumstances much more conducive to deadly violence than discreet markets, where acquaintances connect in multi-purpose

⁸ For example, Jackall (1997) found that about 60% of drug-related murders in the Washington Heights neighborhood of New York City during 1987-1993 were motivated by robbery or “spontaneous emotional disputes” while only 33% were perpetrated as a “rational business tool.”

locations such as bars or where transactions are consummated by delivery to the buyer's residence (Boyum and Kleiman, 2003; Reuter, 2009). And indeed that theoretical prediction seems to be borne out empirically, for example in the dramatic differences between the relatively discreet and peaceful retail-level powder cocaine markets of the 1980s and the more flagrant and violent crack markets.⁹

One reason current ITTP in the U.S. has not been very violent to date is that the retail markets are indoors and discreet. A corner store selling smuggled cigarettes is not markedly more exposed to robbery than any other corner store; the proprietor will not fear to call the police if he is robbed; nor is it likely that any additional cash on the premises related to ITTP significantly increases the amount of cash necessary for normal retail operations. Moreover, he is not part of a street-corner social scene and has less practical or prestige need than does an open-market drug dealer to create and maintain a reputation for dangerousness (Topalli, Wright, & Fornango, 2002).

However, the illicit tobacco markets are not violence-free. Much of the violence appears to occur up the supply chain, away from the retail level. In 2015 in Virginia, robbers accosted at gunpoint two traffickers loading cigarettes into a vehicle and escaped with \$90,000 worth of cigarettes and \$25,000 in cash (Green, 2015a). Overall, nevertheless, the levels of ITTP-related violence in the United States appear to be dramatically lower than the levels of violence in dealing "hard" drugs. Reuter and Majmundar (2015) assert that "the illicit tobacco market is not associated with violence" based on experience in Europe. Their report also notes that analogous research has not been performed in the United States, although various domestic incidents involving violence and ITTP have appeared in the media.¹⁰ Statements from law-enforcement agencies tend to stress violence associated with ITTP: for example, U.S. Attorney's Office states that trafficking has become increasingly violent in Virginia as competition increases between various trafficking organizations (Green 2015b).¹¹ With the potential profits to be made, and the history of other forms of organized crime such as firearm and human trafficking, some experts expect organized-crime networks to expand their market share (Green, 2015a; Pelfrey, 2014). Despite these plausible expectations, it is impossible to measure accurately the level of or trends in ITTP-related violence in the U.S., because crime is not tracked systematically by that category. Regardless, ITTP is not currently close to involving as much violence as the market for illicit drugs from Mexico.

3. Links to terrorist organizations

In some cases in the U.S., criminal organizations have sent the proceeds from ITTP to terrorist organizations (Reuter and Majmundar, 2015; Sanderson, 2004; Shelley and Melzer, 2008; U.S. Dept. of State, 2015). The importance of the link between the illicit tobacco market and terrorism is contested. Reuter and Majmundar (2015) find that it "appears to be minor" (p. 1–8) in the United States, based on

⁹ Vaughn et al. (2010) found no evidence that the two forms of cocaine directly lead to intrinsic differences in the propensity for violence by users (after controlling for confounding factors).

¹⁰ For just one example, in November 2009, 14 people tied to a contraband cigarette ring were arrested in Virginia. Members of the ring had asked undercover investigators to murder two of their competition (Johnson, 2010). See Green (2015a) for an example of realized violence.

¹¹ In addition, Green (2015c) quotes a member of the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) office in Richmond regarding ITTP in Virginia as claiming that "the violence is increasing. There's always been a degree of it, to a much smaller degree."

cases examined from 2004 and 2005. The Financial Action Task Force (FATF, the lead inter-governmental body promulgating policy to fight terrorist financing) notes, however, that the relatively small number of confirmed cases linking ITTP and terrorism may be due to local jurisdictions predominantly investigating and prosecuting only the predicate offense—the ITTP—but not the associated money laundering or financing of terror (FATF, 2012a).

Some law-enforcement personnel and official government sources indicate that the problem of ITTP financing terrorism is larger than Reuter and Majmundar (2015) suggest. In 2007 and 2008, officials in New York and from the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) estimated that cigarette smugglers earned, in the aggregate, between \$200,000 and \$300,000 per week (i.e., up to \$15.6 million per year) in New York, with a large fraction of the money “believed to be sent back to the Middle East, where it directly or indirectly finances groups such as Hezbollah, Hamas, and al Qaeda” (U.S. House, 2008, p. 4). More recently, the ATF (2015) stated that “[o]rganized criminal groups, including those with ties to terrorist organizations, have increasingly engaged in the illegal trafficking of tobacco products....” A U.S. Department of State (2015) report adds that cigarette smuggling is “a lucrative crime for some terrorist groups and a potential revenue source to finance acts of terror” and “encourages a convergence between organized crime, terrorist groups, and other threat networks” (p.2), though without providing much in the way of specific, detailed evidence. The high priority given to violent crime compared to mere tax evasion creates incentives for agencies seeking resources for ITTP enforcement to stress the violent aspects of the traffic; no comprehensive, quantitative study has yet been undertaken.

The publicly available evidence on ITTP and terrorism is based on case studies (Shelley and Melzer, 2008) and the few occurrences that appear in the media at the conclusion of successful law-enforcement operations. One international report documented some contemporary examples of how trafficking in illicit tobacco was used to fund terrorism in Syria and Iraq, for the benefit of the State of Iraq and the Levant (ISIL/Da’esh) and other Al-Qaeda affiliates (OECD, 2015). Given the high potential profits from and current relatively low risk of ITTP, the predominance of immigrants from the Middle East involved in past trafficking along the I-95 corridor,¹² and the growing trend toward low-budget terrorism,¹³ there is a case for vigilant monitoring of possible links between ITTP and terrorism, but the current extent of the problem, and whether it is increasing or decreasing, remain unknown. The high

¹² We base this assertion on several pieces of evidence. A Congressional report states that “[l]arge scale cigarette smuggling networks in New York State are dominated by tight-knit, nationality-based networks, primarily families through blood or marriage of Lebanese, Yemeni, Jordanian, and Palestinian descent” (U.S. House, 2008, p. 3). Furthermore, in a search we performed of Lexis-Nexis Academic of US newspaper articles from 2015 mentioning “illicit cigarettes” or “illegal cigarettes” and “New York” or “Virginia”, 65% (11 of 16) of the distinct individuals mentioned by name who were charged with or convicted of ITTP-related crimes had surnames of Arab or Muslim origin. Restricting the findings to those involved in large-scale ITTP, the same tally is 10 of 12 (83%). It is worth noting that one of the non-Middle Eastern criminals included in these counts openly declared he wanted to send the proceeds of the trafficking to Hamas (Crudele, 2015). Finally, in interviews with purchasers of illicit tobacco in the South Bronx, von Lampe et al. (2016, p.13) found that “participants emphasized that the Middle Eastern background of the storeowners or clerks...is a strong indicator of illicit cigarette sales. Some believed that the participation of individuals from the Middle East in the illicit cigarette trade is quite pervasive....”

¹³ The growing prevalence of terrorist acts that require only modest funding is discussed in section III.D below.

ratio of potential financial return to likely penalties would seem to make ITTP an attractive target for those interested in financing terrorism, as for criminals with other uses for their money.

B. Existing efforts to combat ITTP

Current enforcement efforts against ITTP appear to be limited, sporadic, and small compared to the scope of the traffic itself. Apart from the occasional high-profile sting operation (U.S. State Dept., 2015), often only when ties to terrorism are involved, federal enforcement of tobacco laws is remarkably lax. Primary criminal responsibility is in the ATF, which spends less than 2% of its budget on fighting tobacco diversion (DOJ OIG, 2009). Primary responsibility for federal excise tax compliance is in the Alcohol and Tobacco Tax and Trade Bureau (TTB), a Treasury Department agency that lacks the power to make arrests.¹⁴ TTB completed about 400 revenue investigations of alcohol and tobacco diversions, but these contributed to the identification of additional excise tax revenue of only \$57 million (TTB, 2016). This amount, which includes alcohol taxes, is a pittance of the value of tax revenue due on all ITTP.

State and local enforcement is limited by the perception of ITTP as a low-priority crime. New York City and other areas with a high incidence of ITTP occasionally conduct sweeps of retail outlets likely to sell illicit tobacco,¹⁵ and law-enforcement agencies in sourcing states such as Virginia occasionally investigate suppliers of illicit product. Few states have entire units dedicated to combatting ITTP. As Ross (2015, p.17) notes: “The legal system often perceives illicit tobacco cases not as serious as the possession of other illicit products, such as drugs or weapons, especially if the trade remains nonviolent.... [T]he illicit tobacco trade is usually a low priority for criminal prosecutions.”

From the viewpoint of the states where smuggling originates—the net exporters of illicit tobacco—the smuggling enterprise constitutes only a minor threat to public safety, compared to the higher-profile gang violence that stems from other illicit drugs. Furthermore, ITTP in general is a boost to state and local revenue in originating states, since cigarette tax and in some cases sales tax has already been collected when the product is diverted into illegal channels. Governments in states where tobacco products are manufactured collect not only tobacco excise and sales taxes but also taxes on the incomes of workers and the profits of tobacco manufacturers. As with any other manufacturing industry, production of tobacco products also stimulates additional economic activity from the inputs purchased by industry and the additional household spending of workers whose earnings are affected by the industry. Every dollar going to the manufacture of tobacco products generates \$1.91 in total sales in the economy, \$0.41 of employment earnings, and \$1.23 of GDP. Furthermore, every million dollars of tobacco product manufactured creates 7.85 jobs.¹⁶ While some of this economic activity leaks out of

¹⁴ The TTB is an inter-disciplinary agency created to monitor and enforce compliance with federal tobacco and alcohol tax laws and to prevent illicit market activity concerning tobacco and alcohol.

¹⁵ See., e.g., www.silive.com/news/index.ssf/2015/11/sheriffs_raid_staten_island_de.html for a recent set of raids.

¹⁶ These results are from static Leontief input-output analysis. The multipliers for Tobacco Product Manufacturing were computed by the authors from the BEA Regional Input-Output Modeling System (RIMS II; BEA, 2013), where the region of analysis was the mainland United States and the latest version of the data available are used (the 2007 benchmark input-output table for the nation and 2013 regional data). The multipliers account for the direct and indirect impacts of spending on manufactured tobacco products: the inputs purchased by the industry, the inputs purchased by supporting upstream industries, and the induced impact arising from the additional household spending of workers whose earnings are affected by the investment and who spend that additional income in turn.

state, the figures nevertheless indicate how important tobacco can be to sourcing states. Effective enforcement against smuggling might worsen these states' overall economies and fiscal picture, and of course the health damage from additional smoking due to the lower price of smuggled cigarettes accrues outside the state.

Efforts to seize product entering the U.S. from abroad, unless such efforts are undertaken with much greater intensity than at present, likely lead to the interception of only a small fraction of the illegal product crossing the border. In that case, smugglers will consider such trivial border seizures as merely a minor cost of doing business (Ross, 2015); the larger cost will likely be the inefficiencies generated by the need to conceal shipments.

C. Potential policy changes that might increase harms from ITTP

Recent action by federal regulators has increased regulation of tobacco in the U.S. The U.S. Food and Drug Administration (FDA) has the authority to regulate tobacco products. The FDA currently lacks the authority to ban any broad class of existing tobacco products, such as cigarettes or cigars, but can prohibit particular ingredients. The Tobacco Control Act of 2009¹⁷ prohibited cigarettes with “characterizing flavors” other than menthol, and instructed the FDA to consider extending that ban to menthol cigarettes. As of writing, the FDA had not yet issued its final determination on menthol.

In May 2016, the FDA extended its authority to include the regulation to e-cigarettes, cigars, pipe tobacco, and other tobacco-related products by “deeming” them to be “tobacco products” under the law. Some new regulations took effect in August 2016.¹⁸ New e-cigarette products will now require authorization from the FDA before they can be marketed. The authorization process requires submission of health studies, information on harmful constituents in the product, product warnings on labels, and other requirements that will raise the costs of introducing new products and potentially lower their demand. Manufacturers of existing e-cigarette products have two years to submit the required information and receive approval for the products, during which time sales can continue, and the FDA does not intend to enforce the review requirements for an additional year after that.¹⁹ Some states place additional regulation on tobacco and e-cigarettes. In May 2016, California banned the use of e-cigarettes anywhere that combustible cigarettes are prohibited and raised the legal age to buy cigarettes and e-cigarettes to 21. Such steps are favored by most mainstream tobacco control advocates, but have been harshly criticized by others as neglecting principles of harm reduction.

Voluminous evidence in the economic literature on regulation in general (not necessarily just for health and product safety regulation) shows that regulation can increase costs, discourage innovation and introduction of new products, and raise barriers to entry for potential competitors (Joskow and Rose, 1989). With higher costs and less competition from the smaller manufacturers who are likely to drop out of the market, prices of licit product may be expected to rise. In addition to regulatory pressure, the

¹⁷ Pub. L. 111–31, 123 Stat. 1776.

¹⁸ See [81 FR 28973](#).

¹⁹ For existing e-cigarettes that were not on the market on February 15, 2007, there is a two-year initial compliance period for manufacturers to submit an application for regulatory clearance, and a “continued compliance period” of an additional year during which FDA does not intend to enforce the premarket review requirements.

increasing tax burden on tobacco is expected to increase ITTP, *ceteris paribus*. Figure 2 shows that the average tax rate and the fraction of the total final price that is due to taxes have increased dramatically since 2000. Since increased taxes have been shown to decrease the incidence of smoking, public health experts continually call for higher tobacco excise taxes. However, there is much evidence that higher prices for legal tobacco products stimulate demand for the illicit substitute of ITTP.²⁰ It is possible that increased availability of non-combustible sources of nicotine such as e-cigarettes might reduce demand for illicit tobacco products, but that would be true only if the taxes and regulations that increase the price of cigarettes do not fully apply to non-combustible substitutes.

Should the FDA decide to ban menthols, demand for illicit product would nearly certainly rise. O'Connor et al. (2012) report that 25% of current menthol smokers stated they would "find a way to buy a menthol brand." Others say they would stop smoking. Given the well-known tendency of survey respondents to underreport socially undesirable intentions (Fisher, 1993) such as engaging in criminal activity, and the low success rate of attempts to quit smoking, the potential fraction of menthol smokers turning to ITTP after a menthol ban may be larger than this statistic suggests.

If menthol cigarettes were banned, switching to menthol-flavored e-cigarettes might be a popular choice for menthol smokers. Recent surveys find that 12-15% of menthol smokers say they would switch to menthol e-cigarettes if menthol cigarettes were banned (D'Silva et al., 2015; Wackowski et al., 2015). The availability of menthol e-cigarettes may therefore divert some consumers from ITTP. However, this option would depend on the FDA forbearing from banning menthol flavoring in e-cigarettes. As with combustible menthol cigarettes, the FDA has not (yet) issued rules regarding menthol e-cigarettes, apart from the new regulations affecting all e-cigarettes. As mentioned above, the FDA is tightening restrictions on e-cigarettes at the same time it is ratcheting up regulation on tobacco.

III. Alternative approaches to combat ITTP

In this section we consider three alternative goals. The goals are not mutually exclusive, but are different enough that the methods used to attain them may need to be quite different. The first goal is the suppression of the scale of ITTP generally. The second and third goals are narrower, and therefore probably more feasible to attain. One is to alleviate violence in ITTP, and the other is to disrupt the use of ITTP to finance terrorist organizations.

A. Suppression of market volume

The first option is to aim law enforcement effort against the scale of the illicit market. To distinguish this case from the next, it is assumed that the goal is to decrease the market supply of illicit product and that enforcement will be otherwise untargeted. Prieger and Kulick (2015) model enforcement in a competitive illicit market under these circumstances, and their findings are presented briefly here.

²⁰ See note 2 for the literature on the North American experience and Prieger and Kulick (2016) for the recent European experience with taxation and ITTP.

1. General description

Enforcement against the illicit market is modeled as raising the effective cost of doing business. When enforcement is at level e , marginal cost rises by a positive multiple $\varphi(e) \geq 1$, so that the marginal cost of each supplier in the illicit market is $\varphi c'(q_i)$ (where c is the cost function and c' is marginal cost). The cost multiplier is meant to reflect costs such as perceived risks of arrest, sanction, fine, and incarceration, as well as the risk of product seizure. For example, if the only risk were that one out of every four units intended to be placed on the illicit market were expected to be seized by authorities when enforcement is at \hat{e} , then to actually supply an additional unit would require the production and distribution costs for one and a third units, and $\varphi(\hat{e}) = 4/3$. It is assumed that $\varphi(0) = 1$ and that φ rises with enforcement. Thus supply-side enforcement shifts the supply curve up.

If enforcement is directed only at the supply side, so that the demand curve is unchanged, then enforcement unambiguously raises the illicit market price of the good and lowers the quantity sold (as long as there is at least some elasticity in the demand curve). See Figure 3, in which supply-side enforcement increases the height of the supply curve at Q_A from P_A to φP_A , leading to a shift in the equilibrium from point A to point B . As long as demand is in the inelastic region, it follows that an increase in enforcement will increase revenue in the market.²¹ Since Goldstein (1985) it has been common to assume that violence rises with revenue earned in illicit drug markets. For example, the larger amounts of cash transacted may attract more violent robberies of dealers. If this is indeed so, then the ultimate impact of increasing enforcement against the illicit market is to increase violence.²²

When enforcement raises risk and the perceived price of illicit product for consumers on the demand side as well, the outcome of the model is ambiguous. The change in the market price when enforcement rises depends on the relative supply-side and demand-side sensitivities of price to enforcement; if the demand-side sensitivity is greater than that on the supply-side, the equilibrium price falls. When determining how revenue changes with enforcement, there is an additional factor to consider beyond the usual considerations of the direction of the price change and whether demand is inelastic. Since demand-side enforcement shifts the demand curve itself, there is an additional demand-shifting effect that acts to reduce revenue. Thus, in some cases revenue might fall in response to increased enforcement even if demand is inelastic.²³ In general, therefore, the impact of general enforcement on revenue and violence is indeterminate. In practical terms, this ambiguity is of little significance to tobacco markets, since anti-consumer enforcement is almost unknown.

2. Evidence in general

The empirical literature examining enforcement of drug laws mainly supports the conclusion of the model. Evidence from Caulkins, Larson, and Rich (1993) and Zimmer (1990) suggests that enforcement initiatives against illicit drug markets increased the street price of drugs. The comprehensive surveys of Werb et al. (2011) and Kulick, Prieger, and Kleiman (2016) show that the great majority of studies find a positive association between drug law enforcement and violence. Apart from revenue creating a link

²¹ See Prieger and Kulick (2015) for a complete mathematical exposition.

²² Prieger and Kulick (2015) show that under more general conditions, including demand-side enforcement and bandwagon effects among scofflaws, increased enforcement can lower revenue in the illicit market.

²³ See Prieger and Kulick (2015) for the exact conditions for how price and revenue change with enforcement.

between enforcement and violence as discussed above, there are other possible reasons for the positive correlation. If one motivation for violence is to discourage potential witnesses, increasing either the number of cases or the potential penalties would be expected to increase that motivation. While the studies investigate enforcement of various sorts, the interventions are typically of the untargeted variety under discussion in this section. Moreover, one effect of enforcement is to generate turnover both of personnel within an organization and of organizations within a market, and each such disruption of equilibrium creates uncertainty and opportunities for profitable contestation, temporarily increasing the returns to violence.

3. Application to ITTP

Prieger and Kulick (2014, 2015) and Kulick, Prieger, and Kleiman (2016) show that the market characteristics of ITTP make it likely that enforcement will raise illicit revenue and therefore violence. For example, under the conditions likely to apply to a (yet hypothetical) ban on menthol cigarettes, enforcement is likely to be aimed primarily at suppliers and demand is more inelastic than supply. Under these conditions, the model implies that enforcement would increase revenue and violence. Thus attempts to suppress the market volume of illicit cigarettes may be likely to have the unintended consequence of fostering additional ITTP-related violence. If in fact more intensive enforcement led to more violence, or even to more arrests, prosecutions, and sentences, that raises two difficult questions: (1) Would the gains from reducing ITTP be sufficient to counterbalance the losses, especially considering the already tense relationships between police and residents in low-income neighborhoods where the retail aspects of ITTP tend to flourish? and (2) Even if the answer to (1) is yes, does the political will exist to implement such a strategy and keep it in place long enough to substantially shrink the market? If the answer to either question is no, there is good reason to doubt the practicability of a generalized crackdown.

B. Focused deterrence and dynamic concentration

If unfocused deterrence aimed indiscriminately at all participants in an illicit market is problematic, what alternatives are available? The general notions of targeted enforcement, focused deterrence, and dynamic concentration of enforcement pressure are discussed here.

1. Why focus deterrence?

a. Deterrence

It will be useful for the discussion below to review briefly the economic theory of deterrence. In Becker's (1968) approach, a rational, self-interested potential lawbreaker commits a crime if and only if the expected gain from doing so is larger than the expected (monetary, or at least monetized) punishment. In the simplest formulation with uncertainty attached to the punishment, and adopting the notation of Polinsky and Shavell (2007), the individual commits a crime if the gain g is greater than fine f that will be levied if caught, marked down by the probability of detection and punishment. That is, a risk-neutral individual breaks the law if and only if

$$g > p(e)f \tag{1}$$

where the probability of punishment p is assumed to be an increasing function of enforcement e .

Let the social harm caused by the crime be h in monetary terms. When enforcement is costly, the conclusion for public policy is the fundamental theorem of efficient deterrence: the optimal fine f^* is the largest one satisfying

$$f^* = h/p(e^*) \quad (2)$$

subject to the constraint that the fine can be no higher than the individual's wealth constraint (and where e^* is the corresponding optimal enforcement level). That is, efficiency requires that the largest feasible fine be set in order to make expenditure on enforcement as small as possible. With a reasonably high wealth constraint, equation (2) leads to high fines (i.e., severe punishment) balanced by low probabilities of detection. When the wealth of a potential criminal is not large, then imprisonment can be used to raise the expected cost of transgression for the individual and keep enforcement expenditures lower than they otherwise would be (Polinsky and Shavell, 2007, §9).

When individuals in the society have a distribution of gains from criminal activity, then the optimal probability of detection $p(e^*)$ will not deter all crime. In fact, there will be some degree of underdeterrence, compared to the point where the expected penalty from crime equals the harm, due to the costliness of enforcement (Polinsky and Shavell, 1984). The economic approach to crime sets punishment and allocates enforcement effort to equate the marginal social benefit of enforcement with the marginal cost of enforcement.

In practice, the information required to calculate the optimal level of enforcement—the distribution of g , the wealth constraints, the true value of the social harm from crime—is unavailable. Furthermore, the basic model leaves out many phenomena that would affect the social calculus: the unintended consequences of enforcement discussed above, additional heterogeneity of individuals beyond the gain from crime, and so forth. Finally, it may not be politically feasible to spend the necessary amount for optimal enforcement. These considerations lead to a question of the second best: given any level of expenditure on enforcement, how would the money best be spent to reduce crime? This question leads to an exploration of the benefits of focused deterrence.

b. Focused deterrence in the static case

Uniform application of enforcement effort against crime is inefficient in many cases. Lando and Shavell (2004) demonstrated that targeting effort against a subset of potential criminals can increase compliance for the same expenditure on enforcement. To demonstrate the logic, consider splitting the set of potential criminals in a market into two identical groups. For any given enforcement budget, focusing deterrence on one of the two groups causes compliance to rise in the focal group and fall in the other. However, the gain in compliance from the focal group can outweigh the loss in deterrence in the group with less enforcement.

This simple yet powerful result follows from the sharp threshold for compliance defined by equation (1), as the following example demonstrates. Consider the set of retail outlets in an area that sell cigarettes, and assume that each could gain \$300 per week from selling illicit product. If law enforcement is evenly allocated to detection of the illicit sales through inspections and undercover purchases, then an assumed 10% of the shops can be inspected each week and the illicit activity detected. The fine for

violation of the law is \$2,000.²⁶ The expected net gain of each shop, $g - pf$, is therefore \$100. Since equation (1) is satisfied, all shops will violate the law. Thus any reallocation of enforcement effort that induces any compliance increases deterrence in the market. Such reallocation could be as simple as inspecting only one shop each month, randomly chosen but announced in advance; then all other shops are undeterred as before but the shop of focus will be compliant since the gain no longer outweighs the expected penalty, which has risen to the full \$2,000.

Reallocation of enforcement need not be so extreme. If the authorities announced that the half of the shops (e.g., those with odd street address numbers) were the focus of enforcement next week, then the detection and punishment rate would rise to 20% for them. Those shops would face an expected penalty of \$400, large enough to deter the crime. In this example, the compliance rate rises from zero to one-half through focused deterrence, with no increase in expenditure on enforcement. In this market, compliance can in fact be pushed as high as two-thirds by focusing deterrence on that proportion of the shops.²⁷

This example sets aside the question of how much ITTP would merely shift to the other shops. However, as long as illicit trade is less than fully shifted—the expected outcome given imperfect information among consumers—the same principle applies: focusing deterrence can increase compliance. Lando and Shavell (2004) also show that the benefits of focused deterrence accrue under much more general situations than the simple example above.

It is also important to note that the amount of punishment actually meted out also falls. In the example with unfocused enforcement, 10% of the shops are punished each period. With focused deterrence, complete compliance is achieved and there is no punishment. Punishment is costly to perform and may cause harm to individuals and firms apart from the direct fine in ways not modeled above. For example, reputational effects may harm the future business of firms (Baucus and Baucus, 1997) or the earnings prospects of individuals (Raphael, 2014), and if punishment involves incarceration there are other potentially severe costs to the individual, his family, and his community (Rose and Clear, 1998; Travis and Waul, 2003; Lynch and Sabol, 2004). Given these costs, optimal enforcement strategies minimize the amount of actual punishment required to achieve any given level of compliance (Kleiman and Kilmer, 2009).

Can enforcement budgets be allocated even more efficiently? Yes, once repeated play is added to the thinking and modeling about enforcement. In the simplest form, a dynamic enforcement strategy can increase deterrence by endogenizing membership in the group upon which enforcement is focused. Harrington (1988) shows that when inclusion in the focal group is state dependent—in particular, based on past violation—then deterrence increases in both groups. In this approach, the non-target group faces a lesser but still positive probability of detection. Compliance increases in the non-target group

²⁶ This is the fine in New York City for the first violation of selling counterfeit or improperly taxed cigarettes. See www.nyc.gov/html/doh/downloads/pdf/smoke/ste-enforcement-faq.pdf.

²⁷ The probability of punishment is $p = 0.1/a$, where a is the fraction of the market under focus. The expected penalty pf can be lowered no more than to equal the gain of \$300 to still ensure compliance. Solving $g = pf$ yields $a = 2/3$.

because its members do not want to be placed into the focal group, where punishments are higher. Thus, by making the profit opportunities sufficiently more attractive in the non-target group, all potential lawbreakers increase their compliance. Unlike the insight from the static focused deterrence of Lando and Shavell (2004), Harrington's model and conclusions depend more heavily on the particular specification of information and the costs of compliance (Raymond, 1999), into which we do not delve here. Regardless, this work points out that by allowing the effective target of enforcement effort to change over time, the policymaker can potentially design more effective mechanisms for deterrence. Greater possibilities for effective use of targeting in dynamic settings are explored in the next section.

c. Focused deterrence via dynamically concentrated sanctions

We turn now to "dynamic concentration" of enforcement (Kleiman, 1993, 2009; Kleiman and Kilmer, 2009). This approach begins with a mechanism that takes potential lawbreakers out of the static decision problem from above and places them into a game in which strategic considerations multiply the impact of the enforcement expenditure. The basic insight from Kleiman and Kilmer (2009) is that more compliance does not necessarily require more punishment, if the threat of punishment is appropriately placed.

The assumptions are the following. Consider first a one-shot, sequential-move game with n risk-neutral players (individuals or firms). The enforcement agency is assumed to be able to commit to an enforcement mechanism before the game is played and is not treated as a player. There are two actions available to each player: compliance with or violation of a law.²⁸ As above, violation creates a gain of g for the player net of outcomes under compliance (which are therefore normalized to zero). A player's violation will be detected by the agency with certainty, and if sanctioned it will be punished with monetary (or monetized) cost f to the player. The players are ordered and move sequentially; all previous moves are observed by all remaining players. Without loss of generality, the limited budget for enforcement is assumed to restrict the enforcement agency to a single sanction against a single player. After all players have moved, the agency observes the actions and punishes one of the players if and only if one or more players have violated.

Note that with untargeted enforcement, if all players violate then the expected penalty is f/n . To examine the most interesting case, it is assumed that $g < f < ng$, so that if a player knew he would be sanctioned he would not violate but that if he expected all others to violate then he would, too. Thus:

Proposition 1 If the enforcement agency's policy is random, uniform enforcement, then in the unique subgame perfect Nash equilibrium of the sequential game there is no deterrence—all players violate—and one player will be punished.²⁹

Proof The two player case is clear. Player 2 will violate if player 1 violated and will comply if player 1 complied. But then player 1 faces the choice between complying and ending up with a payoff of zero

²⁸ This assumption rules out side payments or communication among players.

²⁹ Kleiman and Kilmer (2009) discuss another Nash equilibrium in the two player game, with outcome comply-comply, but this equilibrium is not subgame perfect since it relies on an incredible threat from the second player to comply if the first player violated.

and violating and ending up with an expected payoff of $g - f/2 > 0$. With more than two players, the game tree has more branches but the result is the same. At some point in the tree, each player faces a choice between ending up with zero by complying or with $g - f/n$ by violating, and chooses the latter. This is true even if the fine is relatively high. For example, consider the three player game with a high fine: $(n-1)g < f < ng$. The game tree is depicted in Figure 4. The optimal decisions of player 3 are marked with arrows in the lowest branches of the tree (those from nodes D through G). Note that “comply if all have complied before me” (at node G) and “violate if all have violated before me” (at node D) are both part of player 3’s optimal strategy. Then, using backward induction, the optimal decisions of player 2 are found in the branches from nodes B and C. Again, “comply if all have complied before me” is part of player 2’s optimal strategy, as is “violate if all have violated before me.” The latter move (at node B) is a dominant strategy in the subgame; player 2 would violate at node B regardless of player 3’s expected choice. Regardless, player 2 at node B chooses between zero by complying and $g - f/n$ by violating. In the first move of the game, then, player 1 is faced with that same choice at node A and chooses to violate, triggering the chain of subsequent violations. A fortiori, the same result obtains with even lower fines, for violation is even more attractive in that case.

Proposition 1 thus replicates the outcome from the example of unfocused enforcement in the previous section: even with spending the entire enforcement budget, there is no deterrence. The agency can do better, however, by concentrating the enforcement. If the agency establishes a priority order for punishment of the players, then the threat of enforcement will be fully concentrated upon each player at the time it must choose whether to commit the crime. Given that the focus of enforcement changes as the game progresses, Kleiman and Kilmer (2009) term this *dynamic concentration*.

To illustrate, imagine that there are two players and that the agency announces that if both players violate then player 1 will receive the single sanction in the enforcement budget. If only one player violates, that player is punished with certainty as before. The unique outcome of the game, whether the moves are simultaneous or sequential, is no violation and no enforcement. Since there is no longer “safety in numbers,” player 1 will not violate. In response, player 2 will comply to avoid the full penalty that would accrue if he violated. Kleiman and Kilmer (2009) show that full compliance remains the unique equilibrium of the simultaneous or sequential game with n players with any complete ordering of priority for enforcement. Thus, under the assumptions of full information and rationality, *any* (countable) number of players can be deterred from violation with threat of a single, dynamically concentrated sanction. Kleiman (2009) likens this counterintuitive outcome to the proverbial Texas Ranger who stops a large, angry mob in its tracks, even though he is down to his last bullet, with the threat to shoot the first person to step forward.

Consider now the case with assumptions of limited information: what happens when players do not observe whether others commit crimes or receive punishment and do not know what the enforcement strategy of the agency is?³⁰ Players assume that there is some fixed probability of punishment p but do not know what it is. They instead hold prior beliefs on the distribution of p , taken for convenience’s sake to be described by a beta distribution. The decision to violate or comply is as before, but each player

³⁰ This situation was first studied by Kleiman (1993).

decides many times now as time passes. Under these conditions, the situation reverts from a game to a decision problem with Bayesian updating of beliefs. Whether the players update beliefs with the Bayesian posterior mean, median, or mode,³¹ eventually the assumed probability of enforcement converges to the number of past punishments as a fraction of the number of rounds of past play in which the player violated.

Kleiman and Kilmer (2009) investigate this scenario with simulations, and arrive at the following conclusions:

Result 1 When there are two players, each with the same prior beliefs about the probability of punishment, and the agency applies at most one sanction in a random, uniform fashion, then there are two possible equilibria of the dynamic system. If the players' prior beliefs about the probability of punishment are low enough, then they will always eventually reach the violate-violate outcome. With sufficiently high priors, they will always reach the comply-comply equilibrium. Each equilibrium is stable once attained.

Result 2 Adding a second sanction, even temporarily, can move the outcome to the comply-comply equilibrium. This outcome is stable even after the possibility of the second sanction (or even both sanctions) is removed. Of course, this result depends heavily on the players basing expectations about punishment only on past experience and knowing nothing about the enforcement agency's strategy or limitations.

Result 3 The same results obtain with more than two players and more than one sanction available. Eventually the outcomes settle to either the high-violation or low-violation equilibrium.

Result 4 The same "tipping" from the high-violation equilibrium to the low-violation equilibrium can also be accomplished by dynamic concentration of the punishment. Prioritizing the players for punishment will more rapidly increase the perceived probability of punishment held by players at the top of the list. Once they stop violating, the perceived probability of punishment of the next prioritized players begins to rise, and so on. Compared to random enforcement, with dynamic concentration it takes fewer budgeted sanctions to tip the system to the low-violation outcome.

As Kleiman and Kilmer (2009) summarize: "There are 2 equilibria; which is reached depends on the initial subjective probabilities; increasing sanctions capacity can reduce the level of sanctions actually imposed; a temporary increment to sanctions capacity can 'tip' the system to its low-violation equilibrium; and dynamic concentration will outperform equal-probability sanctioning." It is important to recognize that although the decision-makers in the model have severely limited information available, they are still rational. Departures from rationality will be considered in section IV below. Note also that the model assumes that observation and detection are costless. While the model can easily be extended to account for costs of detection, the constrained resource must be actual punishment. The greater the

³¹ If the prior distribution is Beta(α, β), there have been m rounds in which the player chose to violate, and the player has experienced k punishments, then the Bayesian posterior mean is $(\alpha+k)/(\alpha+\beta+m)$, the posterior mode is $(\alpha+k-1)/(\alpha+\beta+m-2)$, and (at least for some values of α and β) the posterior median is sandwiched between the two (Payton, Young, and Young, 1989). Thus all converge to the "natural" estimate k/m as m grows large.

cost of observation compared to the cost of punishment, the less the advantage available from dynamic concentration.

2. Evidence on targeted enforcement

Criminologists have studied whether targeted enforcement works better in actual practice than the status quo of unfocused deterrence. The nature of the targeting varies across the enforcement interventions studied, and of course is never applied exactly as in the simple models above. Furthermore, it is not clear whether the enforcement budget was held constant so that the interventions reflected a reallocation of effort and not also an increase in enforcement activity. Finally, the results are necessarily specific to the particular case studies. Nevertheless, the literature concludes that targeted enforcement is generally—but not uniformly—effective at reducing crime.³²

The meta-analysis of Mazerolle, Soole, and Rombouts (2006) concludes that enforcement targeting geographic areas with high drug-related crime (what they term “geographically focused problem-oriented/partnership policing”) is the most effective enforcement strategy. In particular, they found that such targeting reduces crime more than unfocused community-wide policing efforts. Other recent literature shows that targeting does not merely displace crime to other locations (Braga et al., 1999; Weisburd et al., 2006). As the latter study puts it, “crime does not simply move around the corner.”³³ Targeted enforcement in high-crime areas has also been found to create “anticipatory benefits”—an intriguing finding for the economic approach to crime, which assumes forward-looking behavior by would-be criminals—and a diffusion of the benefits by lowering crime in non-targeted areas (Goldkamp and Vîlcicã, 2008).

3. Focused deterrence in action: Pulling Levers

The premier implementation of focused deterrence against individuals involved in drug and gang crime is “pulling-levers policing” (PL) (Kennedy, 1997). A PL intervention attempts to reduce crime through the strategic application of enforcement against specific individuals, not just areas, coupled with social service resources to encourage desirable behaviors (Braga and Weisburd, 2015). Thus PL makes use of both sticks and carrots, which does not contradict the enforcement-only models above since the punishment was net of any “carrots” gained by compliance. We return to the potentially important distinction between sticks and carrots in section IV.E below.

The essential features of PL in practice are the following (Kennedy, 2006; Braga and Weisburd, 2015). An interagency state and federal enforcement group is formed to combat a particular area of crime such as gun violence in a city. After research to identify key repeat offenders, their organizations, and their contexts, the group designs an enforcement intervention directed at these offenders. The group communicates to the targeted individuals to inform them that that they are under scrutiny, which particular crimes will receive the heightened punishment, and when other targeted individuals have been so punished. The intervention employs all available possibilities for enforcement—pulling on all available “levers”—to sanction offenders who commit violence so that they face high costs of offending.

³² See Goldkamp and Vîlcicã (2008) and the studies cited therein.

³³ Weisburd et al. (2006) also discuss why early empirical studies reaching the opposite conclusion were generally methodologically unsound.

Face-to-face meetings with police, social service workers, and community leaders such as clergy instruct the targeted individuals in what they can do to avoid enforcement action.

PL was first implemented in Boston with apparent success during the mid-1990s with Operation Ceasefire. Operation Ceasefire differed from previous crackdowns on gang violence in two ways: the target of enforcement was violence rather than drug sales, and prevention of violence (through the carrots and sticks mentioned above) was prioritized over prosecution. Subsequently, PL has been applied to reduce homicides and gang violence in Boston, Chicago, Cincinnati, Lowell, MA, Indianapolis, Los Angeles, New Orleans, Newark, and Stockton, CA. In other areas it has been implemented specifically as a drug market intervention (High Point, NC, Nashville, Peoria, and Rockford, IL). While both the specifics of implementation and the outcomes differed across applications of the interventions, PL is generally found to be successful at reducing violence and homicide.³⁴ Braga and Weisburd (2012) perform a meta-analysis of 11 studies examining focused deterrence interventions. All but one study reported statistically significantly reduced crime associated with the intervention, as estimated using quasi-experimental methods.³⁵ The meta-analysis yielded a standardized, overall effect of PL on crime that Braga and Weisburd (2012) characterize as “relatively large” in comparison to impacts of other interventions studied by criminologists.³⁶

C. Focused deterrence against ITTP-related violence

Targeted enforcement, dynamic concentration of punishment, and PL have not yet been applied to ITTP. While there have been many enforcement actions in the U.S. against ITTP, all seem to have stemmed from general enforcement against ITTP or from sting operations against particular (typically) small groups engaged in organized crime, sometimes with an anti-terrorism angle. Such stings typically take the opposite approach from PL: instead of informing the targeted group that it is under scrutiny, secrecy of the investigation is maintained until the enforcement sweep and arrests begin.

1. Pulling Levers in action against ITTP

What might application of PL look like against ITTP with the aim of reducing violence? Drawing on the discussion of PL in Braga and Weisburd (2015), the effort would begin with formation of an interagency—and perhaps multistate—task force involving police, federal and state prosecutors, probation agencies, and state and federal agencies with knowledge of ITTP (such as the TTB and the enforcement division of the Northern Virginia Cigarette Tax Board). The White House’s Office of National Drug Control Policy (ONDCP) currently operating High Intensity Drug Trafficking Area (HIDTA) program is a potential model for such a cooperative arrangement. The HIDTA program was created to coordinate drug-control activities among federal, state, and local enforcement agencies, facilitate the

³⁴ See Braga and Weisburd (2012) and Corsaro and Engel (2015) for citations to the literature examining Pulling Levers in these cities.

³⁵ The exception was Newark’s Operation Ceasefire, from which there was a reduction in injuries from firearms that was too small to attain statistical significance (Boyle, et al., 2010).

³⁶ The figure computed, 0.604, is Cohen’s *d* statistic, used widely in meta-analyses: the difference in the mean outcomes between the intervention and control groups (however defined in the studies) divided by the standard deviation of the data. Cohen (1988) categorizes a *d* statistic between 0.5 and 0.8 as a “moderate” effect, but the designation is arbitrary.

sharing of data, and manage relevant funding across the federal government.³⁷ Operation Xcellerator of the US Drug Enforcement Agency (DEA) provides another example of a successful multistate, multiagency operation against illegal drugs. The operation, concluded in 2009, resulted in 775 arrests, seizures of 23 tons of narcotics worth almost \$60 million, and 169 weapons (BBC, 2009). The operation comprised six federal law enforcement bodies and benefited from more than 200 federal, state, local and foreign law enforcement resources. Even though these efforts were not examples of PL, such cooperative arrangements demonstrate that interagency cooperation is possible.

Following Kleiman (2009), the next steps would be to bring the enforcement capacity of these agencies to bear on the single or multiple priority targets (the choice of which to be discussed below). Once enough offenders have been incarcerated or deterred from the targeted activity—ITTP-related violence, in this case—equilibrium in the selected area should tip from the high offending to the low offending outcome. Then the temporary increase in enforcement effort toward that specific group or area can be diminished while maintaining the stability of the low-violation equilibrium. The enforcement resources so freed up can next be applied to tip a new target, and so on.

There are certain practicalities that must be observed for this scheme to work. Under what conditions are PL and dynamic concentration likely to succeed? Kleiman and Kilmer (2009) note that subjects must be susceptible to deterrence, which is to say that they must weigh the costs and benefits of illegal behavior (even if not in a perfectly rational manner) and that they perceive punishment as sufficiently costly to influence behavior if the probability of enforcement exceeds some threshold. Since ITTP, at least on the supply side, does not involve impulsive behavior or crimes of passion, this condition is likely to be satisfied. Dynamic concentration and PL are also best suited for situations in which detection is relatively easy and the set of potential offenders is known. When detection is difficult it is harder to issue credible threats of punishment, but even in that case the logic of the example in section B.1.b above makes it clear that focused deterrence is more efficient than untargeted effort at detection and enforcement. More problematic is the case in which potential offenders cannot be easily identified. In such settings, certain practical aspects of PL, such as the face-to-face warnings about the new enforcement “rules of the game” become infeasible. Alternatives to direct communication can include informal methods of spreading warnings such as through informants and parolee networks to accomplish the same task. Regardless, the model described in section B.1.c above with Bayesian learning by violators about the probability of punishment does not require an a priori known set of offenders. Finally, particular acts of violence must be able to be linked to ITTP and to specific individuals or criminal organizations (unless the target for enforcement is to be an area rather than a set of people).

The next important question is which criminal activities and set of offenders to target.³⁸ The main choice of which crime to target is among ITTP in general, violent crime committed in the course of (or ancillary to) ITTP, and ITTP that funds terror. Given the existing widespread, large-scale interstate smuggling operations in the U.S., and the difficulty in detecting the illicit activity, attempting indiscriminately to

³⁷ Information on the HIDTA program is available at <https://www.whitehouse.gov/ondcp/high-intensity-drug-trafficking-areas-program>.

³⁸ Chi et al. (2013) discuss similar issues in the context of applying targeted enforcement to Mexican drug violence.

target all ITTP—at least any further up the supply chain than the retail level—may be difficult. Focusing deterrence on violence associated with ITTP may be more promising, because it is not as prevalent as ITTP, is easier to detect, and is likely to involve a smaller number of potential offenders.

Furthermore, attempting to stamp out all ITTP raises the stakes for participants in ITTP by putting the entire industry's profits at risk. On the other hand, high levels of violence are not essential to ITTP, and it is possible that participants could be easily persuaded to abandon it. A focus on violence would, however, require a re-orientation of current enforcement effort, which mainly focuses on the trade in and flow of illicit cigarettes.

Next is the choice of which offenders to target. If violence reduction is the goal, then the choice is between targeting offenders in particularly violent areas and those who are members of particularly violent criminal organizations or networks. The best choice here depends on whether it is easier to link illicit product detected at the retail level with a source *area* or a source *organization*. Genuine cigarettes from major manufacturers, as long as they are still in their packs, are relatively easy to trace back to their state of intended sale and often also to the first (legitimate) step in the supply chain, the sale from the manufacturer to a wholesaler or retailer in a low-tax state.³⁹ Tracing illicit product to the particular criminal organizations that supplied it is more difficult but still possible in some cases.

With these choices in mind, it is now possible to imagine how focused deterrence against ITTP-related violence might proceed. After formation of the interagency enforcement task force, the authorities publicly identify the target area or organization and announce that ITTP-related violence will no longer be tolerated there. This is the *supply target*. Despite the theoretical result from subsection B.1.c that the ordering of prioritization does not matter, as a practical matter the most violent supply group or area should be targeted first. Policy makers will have to decide how to establish the scoring system that will prioritize potential targets (Chi et al., 2014). The priority scores can depend not only on the extent of violence but on other considerations such as the identity of the victims (e.g., shooting a law enforcement officer may warrant a higher score than shooting a competitor). Community input from a range of stakeholders can be an important part of developing the scoring system (Paul, et al., 2011). This has the advantage of creating some disincentive for violence even in non-targeted areas, since the dealers in those areas will reasonably want to avoid having their location chosen next.

Then the authorities should go after the retail outlets likely to carry illicit product from the supply target. These outlets become the *retail target*. For example, if the supply target is violent criminal organizations in the Richmond area (a hub of ITTP in Virginia [Greene, 2016]), then small convenience stores (known as bodegas)⁴⁰ in the Bronx may be a natural starting point given the past history of enforcement against

³⁹ In Virginia, cigarettes intended for resale in higher-tax states may be purchased legitimately in bulk from large retailers such as Walmart and Sam's Club or from wholesalers and other distributors by retail companies set up as fronts for ITTP (Green 2015c). The latter has become more common as monitoring of activity at the big-box retailers has increased in recent years. Such retail "fronts" buying wholesale avoid retail sales taxes but not excise taxes (see www.tax.virginia.gov/content/tobacco-products-tax-faqs).

⁴⁰ Smokers residing in the South Bronx indicated in focus groups that they preferred buying illicit cigarettes from bodegas instead of street sales, in part because of the perceived higher likelihood of receiving inferior product (stale or poor-tasting counterfeit cigarettes) from the latter (von Lampe et al., 2016).

ITTP in New York City.⁴¹ The authorities make known to such stores in the area that they face a high probability of inspection for illicit product, and that if it is found and can be traced back to the supply target, the legal repercussions will be severe. The possibility that retailers are intimidated or coerced into maintaining supply-chain relationships with violent organizations may mean that sole reliance on retail targeting is ineffective without some direct pressure on the supply targets. To take advantage of dynamic concentration, the retail targets may also be subdivided for focus or prioritized for enforcement, as described in subsections B.1.b and B.1.c above. Once equilibrium tips toward compliance, another retail target or (if violence from the supply target has been suppressed) another supply target can be chosen.

The advantage of leaning on the retail targets instead of solely on the supply targets directly is twofold. First, detection is likely much easier at the point of retail sale. For example, authorities in New York City regularly conduct such stings and sweeps to combat ITTP. Petty criminals selling single, untaxed cigarettes (“loosies”) on street corners and in parks are well known to police in at least some areas of New York (Baker et al., 2015). On the other hand, membership in, or even the existence of, some supply organizations may be less well known to authorities (although this is less likely to be true with the most violent organizations). The second advantage of focusing on retail targets is that the supply target may involve activity outside the U.S., as with counterfeiting operations, importation of cheap whites, or the future possible involvement of violent Mexican drug trafficking organizations in ITTP if more types of tobacco products are banned in the U.S.⁴²

To paraphrase Kleiman’s (2009) conclusion for application of dynamic concentration to drug markets, adapted for ITTP-related violence: If the authorities focus enforcement and punishment on the most violent organizations, and do so in a highly visible manner, then a supplier of illicit tobacco would have to weigh the benefits of violence—the intimidation of witnesses, the creation of bargaining power against other market participants, and the direct profit from violent robbery of rivals—against the disadvantage of moving himself up on the list of supply targets for enforcement. Moreover, those individuals and organizations (or, alternatively, geographic areas) most prone to violence would be taken out of the market by enforcement action at a higher rate than their less violent rivals, exerting evolutionary pressure toward less-violent ITTP.

2. Challenges to successful implementation

Some challenges would need to be met to implement focused deterrence against ITTP-related violence. The current pattern in New York City of under-the-counter ITTP retailing in corner stores might produce less violence than would ensue if the same volume of traffic were handled by street vendors. That in turn suggests a potential unwanted side-effect of cracking down on retail targets: if the increased enforcement were to drive ITTP back to street vendors, the result might be increased violence. That

⁴¹ Between August 2011 and December 2014, 45.5 percent of the locations inspected by the New York City Office of the Sheriff were in possession of illicit cigarettes (von Lampe, et al. 2016, citing an online report from the New York City Department of Finance that is no longer available online). Many locations inspected were bodegas. From October 2014 through February 2015, 58.8 percent of locations inspected were in possession of illicit cigarettes (Green, 2015c). Of contraband cartons seized with readily identifiable origins, 92 percent were from Virginia.

⁴² Kulick, Prieger, and Kleiman (2016) discuss the latter possibility.

offers a reason to approach a crackdown on discreet retailing (as discussed in section II.A.2) with caution; police should be vigilant about the re-emergence of flagrant retailing and prepared to shift their focus as necessary to prevent such a re-emergence. However, a third market format, in which customers order by text message and dealers deliver, now reportedly dominates illicit-drug retailing in New York. This format might combine two attractive features from a law-enforcement perspective: less convenient access than corner-store availability (especially for new buyers in the marketplace) and less flagrancy and therefore less violence than open-air dealing (Reuter, 2009).⁴³ A retail ITTP market that is off the street, out of the corner store, and more difficult for potential buyers to access might be the best available outcome. Enforcement practices could encourage such an outcome by putting less pressure on the home-delivery market than on the other two potential market forms. However, managing the repression of open-market ITTP without exacerbating police-community tensions will be challenging, assuming that it is possible at all; the best hope would be early detection and a quick mobilization of enforcement pressure to keep that market from growing to a size where large numbers of arrests would be required to get it under control.

There are further challenges for focused deterrence. Investigative bodies must have or be able to develop the capacity to connect identified violent actors to ITTP-linked organizations or ITTP-related activities. Traffickers in ITTP may also perpetrate violence that is unrelated to their conduct of ITTP, and such activities should not be conflated with ITTP-related violence. Making these connections between individuals, ITTP, and violence may require more thorough investigative methods, coordination, and technologies than are currently employed. A successful program of investigation and enforcement would need the capacity to store, process, and analyze attribution data to create priority targets. A template, discussed in Chi et al (2013), is the Organized Crime Drug Enforcement Task Forces (OCDEF) that utilizes a regionally organized system to create “comprehensive intelligence pictures of targeted organizations, including those identified as Consolidated Priority Organization Targets (CPOTs).”

Fiscal politics and constraints within and among agencies may present additional challenges. Focused deterrence and Pulling Levers would require higher-than-usual levels of flexibility and cooperation across agencies, which can strain limited staffing and budgets. The complicated task of reaching agreement to prioritize ITTP among the participating agencies could also butt up against internal resistance. Decision makers in some agencies might perceive that the opportunity costs of such a commitment to fighting violence and ITTP are too high.

Finally, following a strategy that eliminates large, violent players in the ITTP market could create short-term dynamics that temporarily offset the anticipated reductions in violence. Leadership removals and fragmentation inside criminal organizations can lead to increased violence as the potential successors in the organizations seek to signal their comparative advantage in violence (Chi et al., 2014; Dickenson, 2014). Enforcement that disrupts established hierarchies among criminal groups in the market can also spur renewed competition among groups, with attendant violence (Moeller and Hesse, 2013). These

⁴³ Rosenfeld (2016) cites Zimring (2011) as evidence that changes in illicit drug market transactions such as the use of mobile phones to connect dealers with customers and the lower prevalence of open air street markets have reduced drug market violence.

considerations enhance the benefits from targeting violent players in the market, however. If the intervention is successful at communicating (and proving) that “violence does not pay,” then violence would no longer serve as a signal of fitness for leadership or an effective method of gaining market share.

D. Focused deterrence against terrorism

Another possible enforcement goal is to reduce the flow of funds created by ITTP that finance terrorist groups or acts. Individual terrorists and small terrorist cells have much lower financial needs than parent organizations such as ISIL, since the costs of planning and executing a terrorist attack are lower than maintaining a fighting force, recruiting fighters, running propaganda operations, etc. (FATF, 2016). Some recent terrorist acts such as the Paris attacks of November 2015 have been carried out with very limited funding.⁴⁴ ISIL is making increasing use of small-cell terrorism, which is typically self-financed, implying that modest amounts of money from ITTP or other sources could go a long way towards the spread of terror. As discussed above in section II.A, there are historic and current links between cigarette smuggling and terror organizations like the Irish Republican Army (IRA), Hezbollah, Hamas, al Qaeda, ISIL, and others (US Dept. of State, 2015). As with targeting violence, a scoring system could be developed to prioritize targets engaged in ITTP to fund terrorism. The goals and scores could interact; for example, an organization using more violent tactics on American streets while sending revenue abroad to support terror could receive a higher score than another potential target generating the same amount of funding for terrorists.

At first glance, the difficulties in applying Pulling Levers to this target loom large. In particular, the targets may be difficult to identify, the targeted individuals may be less prone to be deterred than others involved in ITTP, and greater federal enforcement effort would be required. We discuss these issues in turn.

Given the nature of the severe punishment for financing terrorism, criminal organizations conducting ITTP for this purpose may be expected to hide their links to terrorism. However, when detection is difficult, communication of the threatened punishment becomes harder to accomplish and less credible. Furthermore, the community-involvement aspects of PL are problematic if individuals are difficult to identify and target. There are additional difficulties in this respect if the perpetrators are immigrants with weak ties to the larger communities in which they live and operate.⁴⁵

⁴⁴ Shelley (2015) cites estimates that the Paris attacks cost less than €10,000. The article also notes that one of the attackers of Charlie Hebdo in Paris, January 2015, also engaged in ITTP.

⁴⁵ In reports such as U.S. House (2008) as well as in our own discussions with law-enforcement and industry officials, it is claimed that many smuggling networks in New York State are dominated by tight-knit, family-based groups of Lebanese, Yemeni, Jordanian and Palestinian descent. For example, in 2013 a network of 16 Palestinian men, some with ties to Hamas and other Islamist militant groups and two in the country illegally, were indicted for \$55 million in illegal cigarette sales in New York (Hosenball, 2013). U.S. House (2008) states that “with the Arab network compartmentalized by ethnicity and familial ties, the risk of infiltration by law enforcement is minimal.” Given the underground nature of the activity, we have no way of confirming these statements. However, a review of recent news articles regarding tobacco smuggling along the I-95 corridor shows that the majority of involved individual have surnames of apparent Middle Eastern origin.

Targeted individuals must be susceptible to deterrence. Ideological or religious conviction may make some perpetrators of ITTP for purposes of funding terrorist activity immune to deterrence. However, it appears to be unlikely that all, or even most, targets would be at this ideological extreme. Furthermore, extremists transact with many service providers and other partners up and down the supply chain, and these partners may be more able to be deterred. If doing business with a terrorist-linked ITTP outfit is sufficiently risky, some other players may choose to deal with firms not linked to terrorism. An example of direct pressure on the supply target would be to freeze the assets of individuals or organizations that seek to fund terrorism via ITTP.⁴⁶

To date, applications of PL against gun and drug violence have made heavy (although not exclusive) use of local enforcement resources. The agencies most involved in combating terrorism and its funding, on the other hand, are customs authorities, law enforcement agencies, financial intelligence units, and taxation authorities at the federal or international level (FATF, 2012a). For example, a recent high-profile case⁴⁷ was investigated by Immigration and Customs Enforcement's (ICE) Homeland Security Investigations (HSI), the Federal Bureau of Investigation (FBI), ATF, U.S. Citizenship and Immigration Services (USCIS), the Internal Revenue Service (IRS), and the local police department and sheriff's office, with assistance from Canadian national security and police agencies (US ICE, 2011). Whether a task force with heavy representation of federal enforcement agencies could achieve the necessary "local customization" that has been important to the success of PL in the past is an open question. A recent counter-terrorism financing report explicitly noted the need for better cooperation and coordination between agencies (FATF, 2012a).

The international community of agencies involved with counter-financing of terrorism is already familiar with the notion of targeted enforcement, at least in the general meaning of the term, which may help to bridge the institutional and historical differences among the many agencies involved. For example, FATF (2012b) recommends and discusses the targeted freezing of funds and assets without delay of people engaged in the funding of terrorism.⁴⁸ These financial sanctions are intended to be carried out by the relevant domestic authorities expeditiously and nimbly, regardless of whether criminal proceedings have begun. This flexibility gives enforcement agencies a "quick strike" option to put pressure on domestic ITTP operators channeling funds to terrorist groups even before criminal sanctions can be brought to bear.

The intervention could be designed to make use of the greater information held by illicit market participants about links to terrorism. As discussed in the previous section, pressure can be applied indirectly to the supply target by proximately pressuring the retail target. The goal would be to

⁴⁶ The Office of Foreign Assets Control (OFAC) of the Department of Treasury has power to freeze assets under US jurisdiction of targeted entities including terrorist organizations. See <https://www.treasury.gov/about/organizational-structure/offices/Pages/Office-of-Foreign-Assets-Control.aspx>.

⁴⁷ Mohamad Hammoud was convicted in 2002 of cigarette smuggling, providing material support to Hezbollah in Lebanon, and other crimes in 2002 (US ICE, 2011). Two of his brothers and 22 others were indicted at the same time as Hammoud, a Lebanese national who was in the U.S. illegally. Hammoud led an organization responsible for the illegal smuggling of over \$8 million worth of cigarettes from North Carolina to Michigan during the late 1990s.

⁴⁸ See FATF (2012b) Recommendation 6.

disincentivize retailers and dealers from doing business with the supply target, so that the supply target no longer has a market for its illicit tobacco. Once that supply target is out of business or at least deterred from financing terrorism, the authorities can target the next largest funder of terrorism and repeat the process (Chi et al., 2013). This requires linking the source of retail supply to the specific supply targets, which may be difficult as discussed above.

IV. Discussion

There is a large step from the simple theoretical models of the economic approach to crime, targeted enforcement, and dynamic concentration to the real-world application of Pulling Levers to ITTP. In this section we discuss considerations not reflected in the modeling above and whether they would act to undermine or strengthen the efficacy of such a policy.

A. Timing and enforcement swamping

If violations of the law are expected to increase in response to changes in tobacco regulation, it will make sense to precede the regulation with heightened (or more intelligently focused) enforcement (Kulick, Prieger, and Kleiman, 2016). Suppose that ITTP increases dramatically in response to a new ban on a type of tobacco product (a menthol ban, for instance), with no change in enforcement effort. The higher the overall violation rate, the smaller the risk of punishment for any individual violator. But then Result 2 from section III.B.1.c will apply in reverse, as a spiral of “enforcement swamping” (Kleiman, 1993) ensues, leading to the high-violation equilibrium. Since the enforcement-swamping analysis shows that preventing an increase in ITTP would be less costly than attempting to reduce the size of an established market, it follows that enforcement effort will be more efficiently allocated if applied before market growth rather than after. Recall from Results 2 and 3 above that such an increase in enforcement need not be permanent.

B. Risk aversion

In the economic approach to crime, it is well known that if potential offenders are risk averse then the optimal fine decreases (Polinsky and Shavell, 1984). When individuals are risk averse, fines no longer merely transfer wealth from one party in society to another. The risk from the uncertain punishment lowers the utility of potential offenders beyond just its expected value. However, with large numbers of offenders the total revenue from the fines has little variance and is essentially treated as a sure increase in income for the receiving parties. Furthermore, with risk aversion the marginal utility of wealth is diminishing, and even a full-certainty transfer from an equal or lower income party (as many criminals may be expected to be) to an equal or higher income party destroys social value.

Thus the more risk averse individuals are, the more efficient it is to lower fines and raise the probability of punishment, even when enforcement is costly (Polinsky and Shavell, 2007). This strengthens the case for targeted enforcement and focused deterrence, which can be employed to raise the perceived probability of punishment for all agents (eventually) with no additional expenditure.

C. Passive versus active deterrence

In Becker's (1968) rational choice model of crime, the individual is presented with a static probability of punishment. The expected gain from a criminal act is compared with the expected loss from punishment, and if the former exceeds the latter the individual commits the crime. The probability of punishment is exogenous and immutable, and the choice to commit crime is a simple decision problem. No strategic thinking—for example, backward induction—is required. In this sense, untargeted deterrence makes only modest demands on the rationality of the would-be criminal. (Whether even those demands are too severe is considered in the next section.) Braithwaite (2016) refers to this as “passive deterrence”.

On the other hand, focused deterrence and dynamic concentration often rely on game theory, as seen above. Dynamic deterrence “mobilize[s] a web of complex interdependency” (Braithwaite and Roche, 2001), for the probability of punishment is endogenously determined by the players' actions. Are potential criminals “smart enough” to behave strategically? Without rehearsing the longstanding controversy over the economic approach to crime, which typically has pitted economists and rational-choice criminologists on one side against sociologists and positive-school criminologists on the other (Carroll, 1978), it suffices to note that the case for strategic rationality is stronger for criminal organizations than for individuals. The tools of industrial organization have been applied fruitfully to the criminal organization as if it were a profit-maximizing firm (Fiorentini and Peltzman, 1997), and there is evidence that at least some criminal organizations rationally design effective institutions for internal governance (Leeson, 2007). Furthermore, the usual competitive pressure exerted by markets, licit or illicit, should winnow criminal organizations that depart too far from profit maximization and cost minimization.

Criminal organizations are composed of individual criminals, however, for whom evidence of concordance with economic models of behavior is weaker. Levitt and Venkatesh (2000) conclude from their study of an economically successful local drug gang in a large U.S. city that the decision making exhibited by members of the gang was “difficult (but not impossible) to reconcile with that of optimizing economic agents.” Kleiman, Kilmer, and Fisher (2014) point to empirical evidence from individuals using illicit drugs shows that small probabilities of large punishments do not in fact always deter violation of the law.⁴⁹ Thus the degree to which policies aimed at deterrence can rely on “correct” strategic responses by potential offenders remains an open question, and careful empirical analysis of interventions will be necessary.

D. Homo economicus versus actual behavior

As discussed above, passive deterrence is poor mechanism design; active deterrence makes better use of the scarce resources available for enforcement. However, active strategies such as dynamic concentration of enforcement assume the ability of would-be offenders to maximize their utility

⁴⁹ Kleiman, Kilmer, and Fisher (2014) note that perfectly rational drug offenders with reasonable discount rates should refrain from violation given the severe but low-probability, deferred threats of punishment currently delivered by the criminal justice system in the United States. However, a drug-enforcement intervention (HOPE) designed specifically for individuals who are strongly and irrationally present-oriented, impulsive, or loss-averse dramatically decreased violation rates among probationers.

accurately without costly information-gathering and computation. As posed, then, strategies employing active deterrence are not consciously designed to exploit any systematic departures from rationality the criminal organizations or their members may hold.

The “pure” economic approach to crime ignores the social and psychological aspects of criminal behavior (apart from the tacit recognition that such aspects might have helped to shape [exogenously] the individual’s utility function). As Levitt and Miles (2007, p. 462) note, the simplicity of the economic approach and the “set of sharp behavioral predictions” that follow from it are purchased at the cost of losing the “social context of offending.” Also lost is the well-recognized and voluminous evidence that people often do not act as economists hypothesize. This recognition opens the door to an approach to crime based on behavioral economics (Jolls, 1998; Jolls, Sunstein, and Thaler, 1998; Garoupa, 2003). As in other areas of behavioral economics, the behavioral approach to crime seeks to inform the design of effective mechanisms for deterrence based on insights from empirical and neuroscientific study of actual decision-making rather than on the a priori assumption of rational behavior (Chorvat and McCabe, 2004; van Winden and Ash, 2012). The goal of such informed design is to arrive at a new understanding of effective deterrence by combining psychology and sociology with the familiar tools of economics. Examination of the gaps between the approach of Becker (1968) and the actual behavior of criminals caused by cognitive, emotional, and moral factors is a natural place to begin (Garoupa, 2003).

Before considering how departures from rationality may affect the conclusions of the analysis above, it is important to distinguish between rationality and unrealistically simplified economic models. In some of the non-economic literature on ITTP and illicit drugs, “unlimited rationality” is at times used as shorthand for perfect information, utility functions that depend only on current consumption instead of also on past behavior, or other staples of basic economic analysis as found in an intermediate-level undergraduate course in microeconomics.⁵⁰

Happily—at least for the traditional economic approach to crime—not all behavioral considerations weaken the effectiveness of mechanisms designed to deter rational agents, and some even reinforce the mechanisms’ potential to modify individuals’ behavior. In this section some of the insights from behavioral economics are examined in regard to their importance for targeted enforcement in general and dynamic concentration in particular.

1. Cognitive aspects

We begin with cognitive aspects that may limit the rationality of potential offenders. The notion of limited rationality applied to criminal behavior posits that people use a variety of strategies to evaluate alternative courses of legal and illegal action (Carroll, 1978). These strategies typically involve psychological biases or cognitive shortcuts taken to evaluate the consequences of action rather than the exhaustive analysis required for optimal choice. Notwithstanding, Garoupa (2003) argues that the

⁵⁰ For example, von Lampe et al (2016) contrast “unlimited rationality” with incomplete information, uncertainty, behavior affected by past experience, and perceptual limitations. Only the latter would qualify as possible departure from rationality for most economists. In similar contrast to how economists use terms, later in the same article “bounded rationality” is identified with uncertainty about the probability of enforcement and product quality.

qualitative results expected from the deterrence hypothesis (i.e., that individuals are deterred by larger and more certain punishment) are “quite robust” to behavioral assumptions departing from rationality that have been explored in the literature (Lattimore and Witte, 1986; Neilson, 1998; Garoupa, 2001).

One robust empirical finding from the experimental study of decision-making is that individuals often act as if they were risk-averse toward prospective gains but risk-seeking toward prospective losses. Prospect theory shows that such behavior can be explained by diminishing sensitivity towards gains and losses as their magnitude rises (Kahneman and Tversky, 1979). Harel and Segal (1999) note that prospect theory implies that for maximal deterrent effect, punishment should be as certain as possible. This is because the possibility of punishment entails a prospective loss, toward which the criminal is risk-seeking. As corroboration of this prediction, van Winden and Ash (2012) cite the experimental work of Alm et al. (2009), which found that tax evasion rates were the lowest when the probability of audit was known in advance. Since focused deterrence involves targeting high-priority offenders for increased, more certain punishment, prospect theory suggests that the effectiveness of such approaches may be multiplied beyond the level that analysis based on assumed full rationality suggests.⁵¹ The discussion in section B above, however, implies that the additional deterrent effect of certain punishment comes at a social cost if criminals are truly risk-seeking.

Another robust empirical finding is loss aversion (also explained by prospect theory), in which “losses loom larger than gains” for individuals (Kahneman and Tversky, 1979). Van Winden and Ash (2012) point out that (holding risk constant) the deterrent effect of the loss entailed by punishment will therefore be greater than that predicted by the rational crime model. In particular, therefore, the deterrent impact of targeted enforcement will be stronger than expected, although this would also be true for unfocused strategies.

2. Emotional aspects

Apart from purely cognitive aspects of decision-making, emotional considerations also can play a role (Elster, 1998). Note that examining how emotional factors affect choices regarding crime does not require jettisoning economic modeling: Van Winden and Ash (2012) model emotions as additional factors in the utility function.

a. Anger and negative reciprocity

Perhaps the most natural emotion to investigate regarding violent crime is anger. The tendency toward anger and aggression can induce criminal acts and facilitate cycles of retaliatory violence (Hopfensitz and Reuben, 2009). However, the possibility of provoking angry, aggressive responses to crime (e.g., you rob me, I shoot you) adds to deterrence beyond the potential legal punishment. Furthermore, the possibility of retaliation (“negative reciprocity” in the literature) and therefore its deterrent effect is heightened beyond that predicted by its rational supply, because emotion causes individuals to retaliate “altruistically”, creating positive externalities for society through general deterrence.⁵² As with the

⁵¹ Kleiman and Kilmer (2009, p. 14234) also noted that prospect-theoretic behavior increases the importance of the certainty and swiftness of punishment relative to its severity.

⁵² See van Winden and Ash (2012, § 3.2.1) and cites therein.

cognitive factors discussed above, the emotion of anger thus may provide additional deterrence beyond that stemming directly from any targeted or untargeted strategy for law enforcement.

b. Shame and guilt

Two other potentially powerful emotions relevant to criminal behavior are shame and guilt. These are not synonyms; shame focuses on the self and guilt focuses on specific behaviors (Lewis, 1971). Colloquially, shame causes an offender to say “I am a bad person”, while guilt leads the individual to say “I did a bad thing” (Tangney and Dearing, 2003). The role of shame and guilt in economic decision-making has been explored in many contexts (Becker, 1996; Frank, 1988; Kandel and Lazear, 1992). Shame may be the more powerful negative emotion because it directly hits the self of an individual. Shame can be modeled as a disutility or a temporary heightening of the discount rate (Elster, 1998). In the latter case, intense feelings of shame can invoke extreme modifications of behavior (e.g., “I will never break the law again” or “I am so ashamed that I will commit suicide”).

Research by Hopfensitz and Reuben (2009) shows that the social emotions of shame and guilt may be necessary for successful enforcement of cooperative norms. Pulling Levers at least tacitly attempts to use shame and guilt to further compliance by requiring the targeted offenders to be confronted with the moral voices of their community such as clergy and leaders of other community groups (Braga and Weisburd, 2015). However, attempting to manipulate shame and guilt with the goal of deterrence may backfire. Shame at public disclosure of wrongdoing and censure can quickly turn to anger if the shaming attempt is perceived as deliberate (Elster, 1998). Tangney and Dearing (2003) find empirically that while shame leads to anger and its nonconstructive expression, guilt motivates people to accept responsibility without expressing hostility to others. Thus, a forceful message from clergy that violent crime is a sin requiring repentance, forgiveness, and restitution toward victims may be more productive than attempts to stigmatize. This is in line with Braithwaite’s (1989) reintegrative shaming theory, which emphasizes that to deter crime shaming must reinforce the offender’s membership in the community of law-abiding citizens. That is, reintegrative shaming draws the offender back into community, while stigmatization without forgiveness drives the offender toward criminal subcultures that “reject the rejectors.” Finally, it must be noted that some people are shameless or act as if they have no conscience. Selection effects lead us to believe that those least affected by shame and guilt are those most likely to go into organized criminal behavior such as ITTP.

3. Moral aspects and social norms

Behavioral economics has incorporated the cognitive and emotional aspects above into the study of decision-making in general, and, to a lesser extent, criminal behavior in particular. However, neither the rational-choice nor behavioral approaches explain how preferences toward crime are formed. Clearly, moral considerations restrain many potential offenders from activity that would “make sense” in terms of probabilities and punishments. Ignoring the moral aspects of deterrence leaves an important force out of the equations (Gibbons, 1982; Field, 1991; Garoupa, 2003). Sunstein (1996b) argues that the problem is even worse: moral considerations and shame can actually change preferences through

endowment effects.⁵³ Thus enforcement policies that take preferences as given may be starting on the wrong foot, and attention could be paid to policies designed to change preferences to achieve a social goal.⁵⁴

Laws and enforcement have an expressive function as well as the instrumental function of deterrence. Choosing to punish certain behavior expresses a community's rejection of a certain type of behavior and establishes a social norm (Sunstein 1996a; Garoupa, 2003). Then deviation from the norm can lower the utility of lawbreakers. Pulling Levers makes use of such expression by communicating clearly to the target group that certain behavior will no longer be tolerated in the community. While such a statement is partly to communicate the (newly increased) probability of punishment, surely part of the design is aimed at changing the preferences—not merely the behavior—of the individuals. The communication could be read to the targets by a computer; the inclusion of community leaders and clergy in the face-to-face meetings implies that something more than the mere imparting of information is intended.

E. Aspects of deterrence other than punishment

The evidence discussed in section III.B.3 on the effectiveness of Pulling Levers is not a pure vindication of the economic approach to crime with its emphasis on probabilities and punishments. The literature on focused deterrence emphasizes that PL did not occur in a vacuum (Land, 2015). The involvement of clergy and community leaders has already been discussed. Other aspects perceived by the designers and analysts to be important included guardianship and surveillance of the (young) targeted individuals, deflecting offenders from crime into legal opportunities, and increasing the perceived legitimacy of police action in the community. The targets were offered job training, employment, treatment for substance abuse, assistance with housing, and other opportunities (Braga and Weisburd, 2015). Of course, some of these aspects fit neatly into the theory of deterrence; for example, raising the value of alternative opportunities for potential offenders increases the opportunity cost of violation.

Which particular additional elements will be useful to add to focused deterrence aimed at combating ITTP-related violence will depend on the nature of the phenomenon. For example, if a future product ban or regulation is onerous enough that ITTP becomes as widespread as trade in illicit drugs is today, so that similar domestic gangs as are currently involved in drug violence evolve to deal in tobacco, then the community involvement aspect of Pulling Levers might be very similar. On the other hand, if the target is ITTP related to financing of terrorist organizations, then the additional elements might be quite different. If immigrant, radical ideologues already feel alienated from American society, then pulling on the usual levers may have little effect, and better alternatives will need to be sought.

⁵³ An example of an endowment effect is when granting an entitlement to a good to an individual makes the person value it more than if it were endowed to someone else. As an example, Sunstein (1996) cites experimental evidence showing that people demand far more compensation to allow the environment to be degraded (i.e., when they hold the property right themselves) than they are willing to pay to prevent the same degradation (i.e., another holds the property right). The shame felt in the former situation from breaking the social norm requires larger monetary compensation.

⁵⁴ How the “social good” is defined is more complicated when preferences are not taken as given, of course, and such policies are necessarily paternalistic.

V. Conclusions and policy recommendations

Table 1 contains a summary of the advantages and disadvantages of untargeted enforcement, targeted enforcement against ITTP-related violence, and targeted enforcement against funding of terrorist organizations. The clearest—and easiest—choice is whether to target enforcement. For the reasons discussed in section III.B, it seems apparent that focusing effort to deter the targets (whatever those targets may be) is the most efficient method. Focused deterrence has the advantages of increasing the amount of compliance obtained from enforcement, may in the long run require less actual punishment, and can increase the legitimacy of the law enforcement effort in the eyes of the community. Evidence from application of the Pulling Levers variant of focused deterrence is promising. Finally, the discussion in section IV.D indicates that we need not assume full rationality to obtain at least the qualitative expected results from focused deterrence. While there may be higher setup costs associated with a Pulling Levers style intervention, compared with the status quo untargeted and limited enforcement directed against ITTP in the U.S., it seems clear that the status quo is not achieving its current goal of significantly reducing flows of illicit tobacco. Given the long history of largely unsuccessful attempted general deterrence during Prohibition in the 1920's and early 1930's and the War on Drugs since the 1980's, it is likely that stamping out all ITTP is an unattainable goal.

Once the policy decision is made to focus deterrence, next is the choice of targets. Given its past success in other applications, Pulling Levers appears to be well suited to target ITTP-related violence. Combatting terrorism is an important current goal of public policy and national security, but there may be fewer levers for a focused deterrence program to pull. Part of the value of Pulling Levers, when it works, is that the threat of punishment, communicated directly to the targeted individuals, can obviate the need to undertake actual costly enforcement. However, since uncovering terrorist links would presumably require expensive intelligence work just to identify the players, that advantage may be lost. However, no stark choice of target between violence and terrorism is required. Based on some of the media reports cited above, some participants in ITTP linked to terrorism may also be violent, and targeting the latter will also target the former even if unwittingly. Furthermore, the decision is not binary but instead a question of how to optimally allocate resources between the two targets. Since it is unlikely that the marginal benefit of the last dollar spent on reducing violence is still higher than the first dollar spent on targeting ITTP related to terrorism, efficient allocation of enforcement effort will likely involve both targets.

Decisions remain to be made whether to target specific organizations involved in violence (or terrorism) or any organizations operating in violent areas. While more specific targeting (the former option) would be more efficient, area targeting may require less investigatory expense. And in either case applying pressure to the supply target through retailers and dealers can alleviate problems of asymmetric information about suppliers' activities and proclivities for violence.

Finally, if ITTP is both growing and still below its equilibrium size, because the current minimal risks of market participation are well below the potential profits from ITTP, then the literature on the dynamics of deterrence has a clear lesson. If enforcement is to increase, it should be sooner rather than later. As ITTP grows, the cost (on all dimensions) of bringing it under control also grows; the benefits bought by

the marginal enforcement dollar fall as the size of the market rises. In the extreme, ITTP could become like trade in cannabis: the illicit-market version of “too big to fail.”

Further work will be required to craft an operational intervention to combat ITTP-related violence or terrorist financing. Key to the success of Pulling Levers is the creation of an interagency working group with authority and responsibility for action. A powerful “network of capacity” for enforcement and administration of the intervention is required. This is true regardless whether the target is ITTP in general, ITTP-related violence, or ITTP with links to terrorism, although the included agencies would change with the focus. The collaboration among the agencies in the group will require crossing boundaries that typically separate criminal justice agencies, human service agencies, and the community (Braga and Weisburd, 2015). This may not be easy; criminal justice agencies often have difficulty working together due to the costs of coordination and bureaucratic frictions (Braga, Kennedy, and Tita, 2002). Responsibility for the investigation and enforcement of cases related to the illicit trade in tobacco products (ITTP) is currently spread across several different federal agencies, including the ATF, U.S. Customs and Border Protection (CBP), the TTB, and the FBI. Toward the goal of identifying which agencies would be most appropriate for involvement with focused deterrence aimed at ITTP-related targets, in related future work we are conducting an organizational analysis of the responsible agencies for tobacco.

There are also theoretical avenues to explore further. The zero-violation result that obtains in the dynamic deterrence models discussed above applies in the situation where detection of violators is costless. Where detection is costly and probabilistic (at least from the viewpoint of the violator) there will in general be multiple equilibria of pairs of market size and enforcement effort. Whether those equilibria are stable depends on how the cost of detection varies with the size of the market. If detection becomes more difficult and costly as the market shrinks, then increased enforcement will hit diminishing returns. Total punishment as a function of enforcement effort may be an inverted U.

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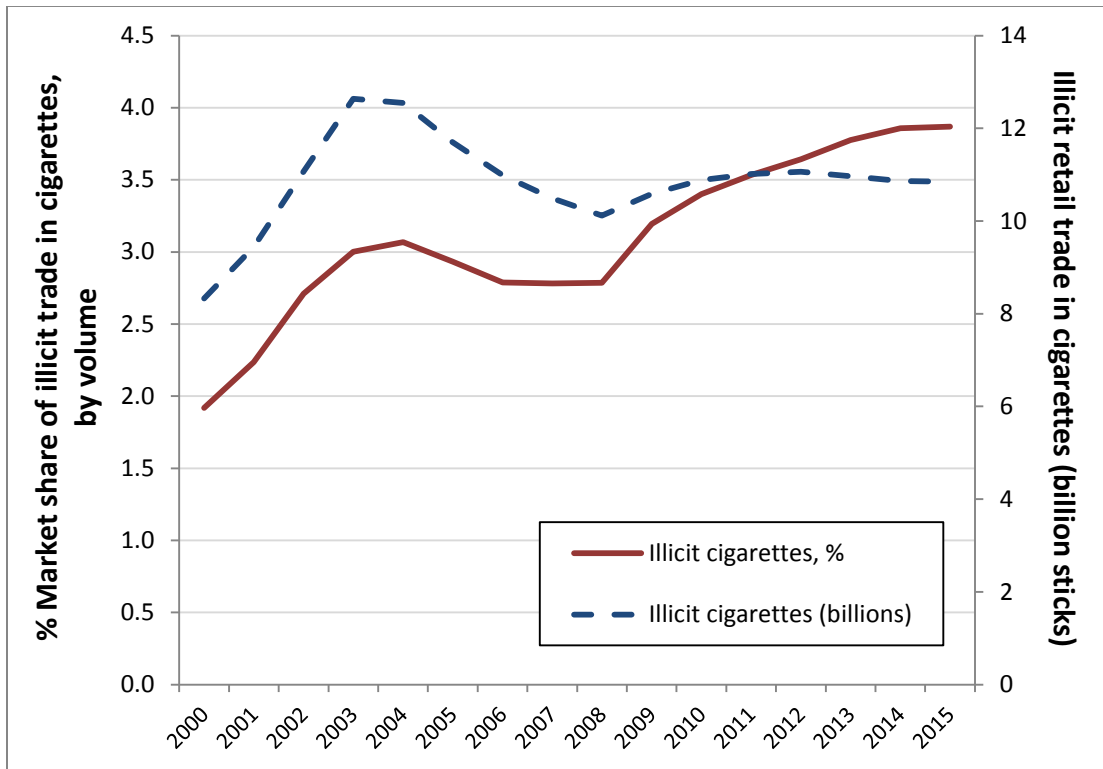
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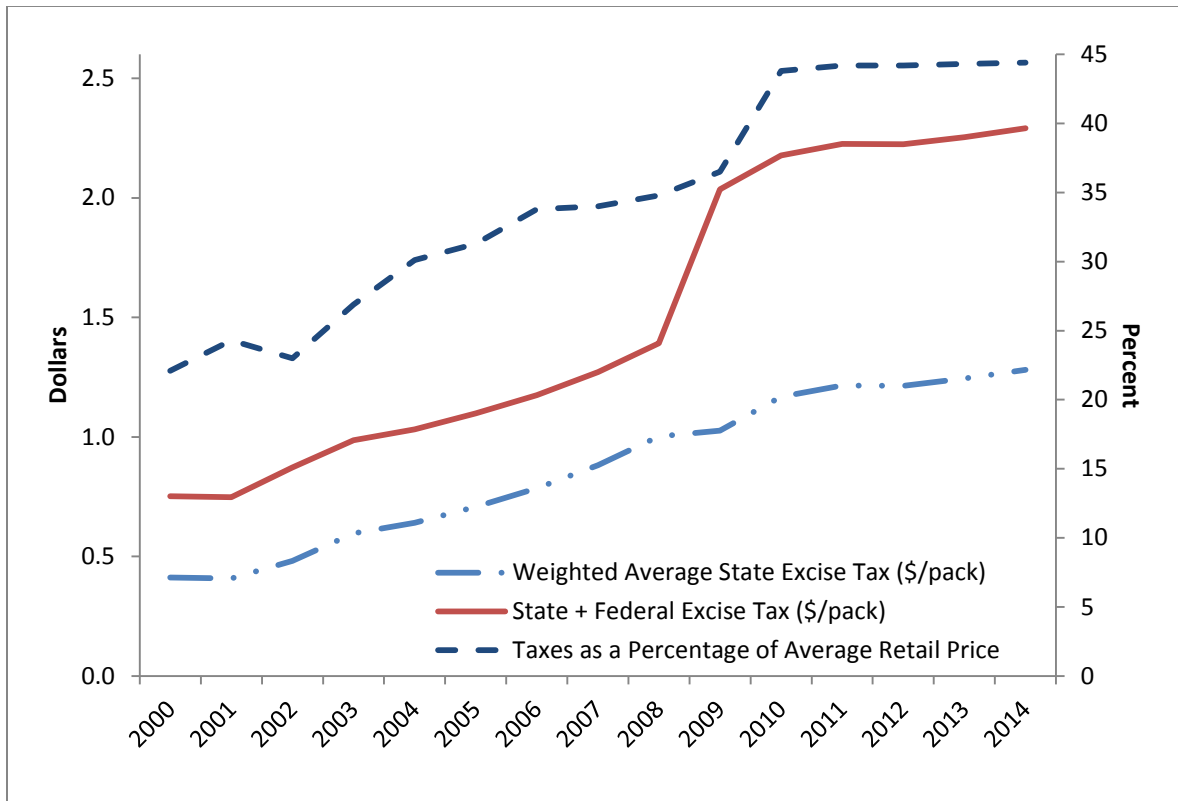
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Figure 1. Estimated illicit trade in cigarettes in the United States



Note: the data source for the illicit and total trade volumes is Euromonitor International (2016).

Figure 2: Growth in the Tax Burden on Cigarettes in the U.S.



Source: Orzechowski and Walker (2015), tables 18 and 21. Sales taxes are not included in the figures.

Figure 3: The Impact of Untargeted Enforcement on Equilibrium in a Competitive Market

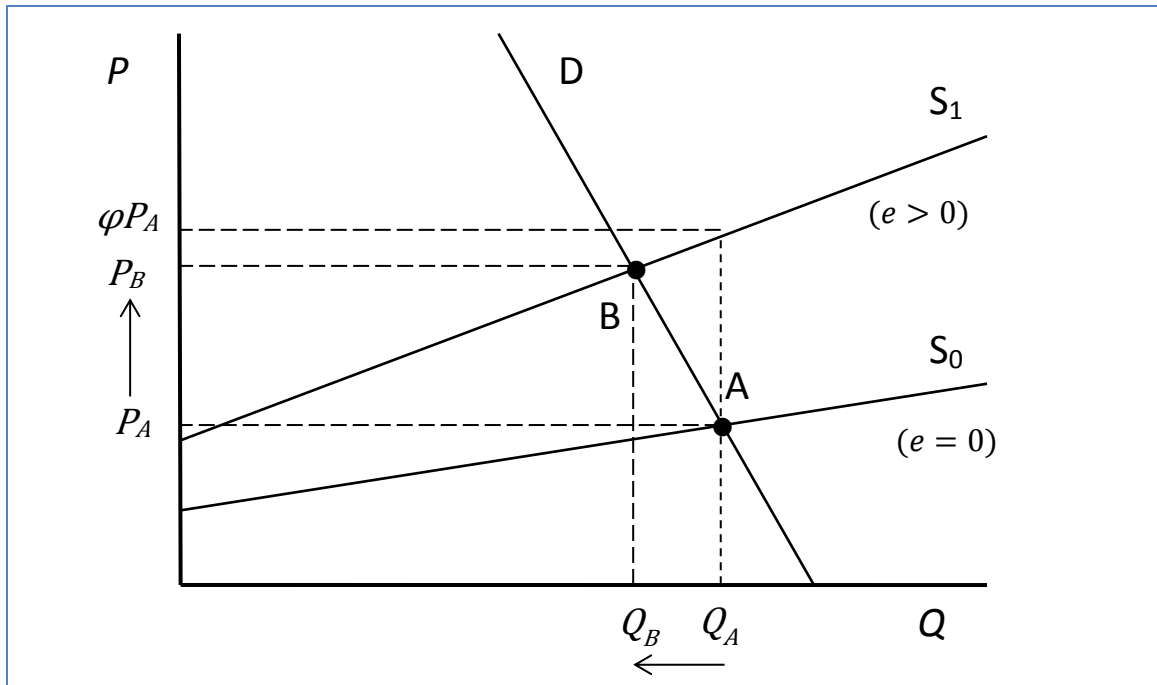


Figure 4: The Game Tree for the 3-Player Game with Random, Uniform Enforcement

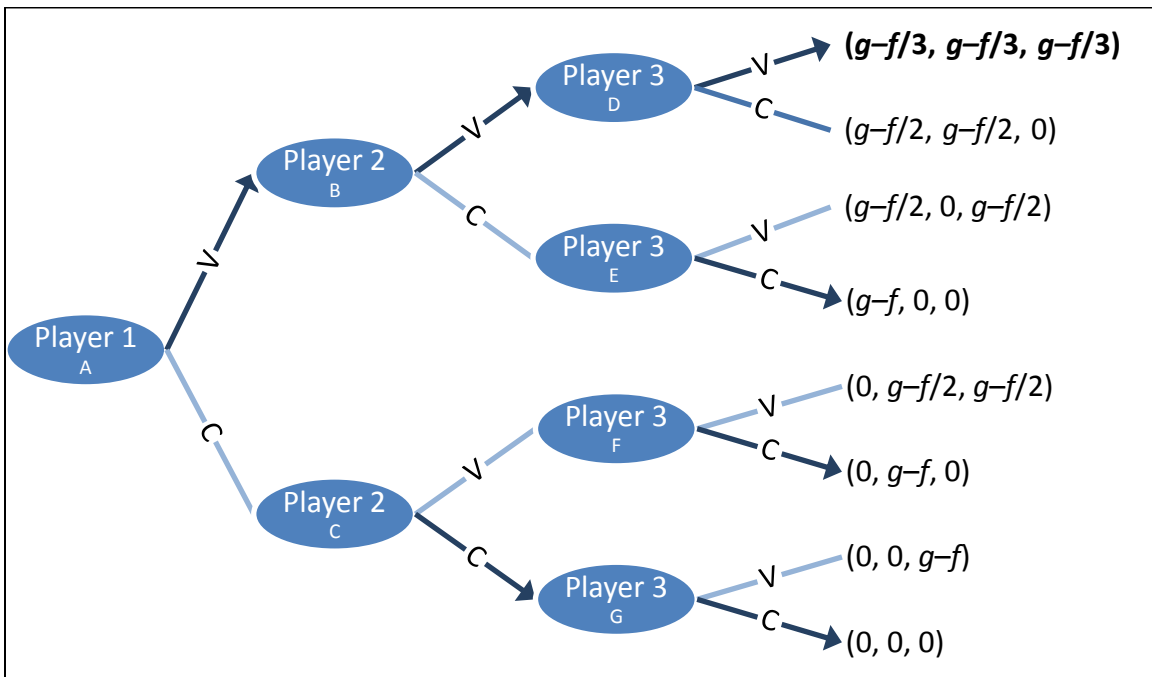


Figure notes: V is the action “violate” and C is the action “comply.” Arrows denote choices in the optimal strategies of the players. The payoffs of the players are in order in the parentheses.

Table 1: Comparison of aspects of various options for untargeted and targeted enforcement

General Target		Advantages	Disadvantages	
ITTP (status quo; untargeted enforcement)		<ul style="list-style-type: none"> No need to trace retail illicit product to a particular source. 	<ul style="list-style-type: none"> Current approach is not effective. Enforcement budget required for significant reduction in supply may be prohibitively high. The more successful at reducing supply, the higher the illicit revenue and violence. 	
Any focused deterrence		<ul style="list-style-type: none"> Leverages impact of any given expenditure on enforcement Evidence shows it has worked well applied to some other targets (gun crime, drug/gang violence) Can increase perceived legitimacy of police action If works, it requires less actual punishment Full rationality of the targets are not necessarily required 	<ul style="list-style-type: none"> May require higher fixed costs for design of intervention, setting up interagency enforcement group, community outreach, etc. Some forms (e.g., full information dynamic concentration) depend heavily on individuals' assumed rationality and ability to think strategically 	
Specific Targets				
	Supply target	Retail target		
ITTP-related violence	Any	Any or none	<ul style="list-style-type: none"> Focuses on the greater problem (violence, not ITTP per se) It is easier to discourage violence than to shut down an organization 	<ul style="list-style-type: none"> Requires detective/intelligence work to link violent acts to particular individuals/organizations
	Violent organizations	Any or none	<ul style="list-style-type: none"> Applies pressure most directly against the producers of violence. 	<ul style="list-style-type: none"> More difficult to link seized retail product to an organization than an area.
	Violent areas	Any or none	<ul style="list-style-type: none"> Easier to link seized retail product to an area than an organization. 	<ul style="list-style-type: none"> Only indirectly applies pressure against the producers of violence.
	Any	Specific target is chosen	<ul style="list-style-type: none"> Retail targets may be easier to identify than supply targets Leverages the greater information possessed by ITTP retailers/dealers 	<ul style="list-style-type: none"> Perceived legitimacy of police action may be lower if the logic of the intervention is not adequately explained
ITTP funding for terrorist organizations	Any	Any	<ul style="list-style-type: none"> Demand for detective/intelligence work higher to identify targets May require buy-in from federal agencies with little experience/interest in combatting ITTP Individuals/organizations may be less deterrable if highly ideologically motivated 	<ul style="list-style-type: none"> Local success can create global benefits