

Technology and the Fight against Illicit Tobacco Trade

INTRODUCTION

Illicit trade in tobacco products poses a pervasive and ever-changing global problem. The smuggling and counterfeiting of hundreds of billion of cigarettes each year seriously harms public health, erodes government treasuries, and threatens public safety and security by supporting organized crime and terrorist networks.

There are many dimensions to illicit tobacco trade. Because smuggled and counterfeit cigarettes usually are available cheaply, they boost consumption and lure younger smokers while undermining public health policies. By depriving governments of billions of dollars in tax and duty revenues, cigarette smuggling and counterfeiting result in reduced funding for public health and tobacco control efforts. Illicit trade also can sabotage high tobacco taxation policy, which studies show is one of the most effective ways to curb tobacco use.

The World Health Organization Framework Convention on Tobacco Control (FCTC), an international treaty that went into effect in 2005, recognizes the importance of eliminating this illicit trade. In 2007, parties to the FCTC agreed to begin negotiating a supplementary treaty, or protocol, for combating illicit trade. The first round of negotiations was held in Geneva in February 2008. A second round will be held late in October 2008.

New high-tech advances, from encrypted tax stamps to microchip technology, may be applied to fighting illicit tobacco trade. The FCTC's Article 15 calls on ratifying countries to adopt ways to ensure that every unit, packet and package of tobacco products is marked to help countries determine a product's origin and to consider establishing a "tracking and tracing" system. A tracking system allows authorities to monitor movement of tobacco products. Tracing helps authorities pinpoint where tobacco was diverted into illegal channels.

THE PROBLEM OF ILLICIT TRADE

While illicit tobacco trade involves a clandestine underworld and its scope is difficult to gauge, it is estimated that as much as one-third of lawful cigarette exports are diverted into the contraband market.¹ For 2006, this billion-dollar business was estimated at 10.7 percent of worldwide sales, or 600 billion

¹ Joossens L, Raw M. Turning off the tap: An update on cigarette smuggling in the UK and Sweden, with recommendations to control smuggling. *Int J Tuberc Lung Dis.* 2003 Mar;7(3):214–222.

cigarettes.² Meanwhile counterfeiting, boosted by new technology, is the category that is growing most quickly among illicit tobacco trade practices.³ In the European Union, for example, the leading threat identified by officials now is production and smuggling of counterfeit cigarettes.⁴

It has been difficult historically for law enforcement to trace contraband tobacco. A former U.S. customs enforcer summarized the challenges this way:

“Invoices frequently described container shipments of cigarettes simply as ‘American made,’ without identifying the brand. The shipments were sold several times while the cigarettes were in transit, the invoices were faxed or otherwise transmitted many times, resulting in critical data being blurred in transmission or possibly altered between transmissions. The cigarette packages and cartons lacked unique serial numbers that were readable by law enforcement authorities. The unique numbers found on master cases were often removed by traffickers to hinder law enforcement efforts to trace the cigarettes.”⁵

TECHNOLOGY ADVANCES

Digital Tax Stamps

New digital tax stamps, using invisible ink and featuring a unique, covert (hidden) code with data for each cigarette pack, make it harder for criminals to manufacture fakes. The stamps contain encrypted information that enforcement officials and others can read with a portable scanner. This allows enforcement officials to distinguish real tax stamps from even the most sophisticated fakes.

To crack down on a serious problem with counterfeit cigarettes, the most populous American state, California, implemented a high-tech tax-stamping system in 2005 along with heightened enforcement measures. The data for each cigarette pack can be uploaded to a central Data Management System.

California’s new system has been calculated to cost US \$9 million per year, while returning significant additional tax revenues on cigarettes. An additional US \$75 million was collected between January 2004 and March 2006 as a result of the tax stamps and a new state law that required licensing of all entities engaged in selling tobacco products.⁶

² Framework Convention Alliance. How big was the global illicit tobacco trade problem in 2006? Geneva, 2007, available at <http://www.ftc.org/dmdocuments/fca-2007-cop-illicit-trade-how-big-in-2006-en.pdf>.

³ Illicit Trade. Euromonitor. June 5, 2008.

⁴ Contraband and counterfeit cigarettes: frequently asked questions. European Union, Brussels, Dec. 14, 2007. Press release. Available at <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/584&format=HTML&aged=1&language=EN&guiLanguage=en>.

⁵ Colledge J III. Testimony to U.S. House of Representatives, Committee on the Judiciary, Subcommittee on Crime, Terrorism and National Security. May 1, 2008. Available at: http://judiciary.house.gov/hearings/hear_050108.html.

⁶ Information collected during a visit at the State Board of Equalization, California, news release June 27, 2007.

California authorities have reported a significant decline in estimated losses from cigarette tax evasion, from US \$292 million in 2003 to \$182 million in 2006.⁷

Investigators suggested that seizures of counterfeit products at retail locations declined, as did the percentage of retailers carrying counterfeit products.⁸

A digital tax-stamp system is in place in Brazil, which has experienced the greatest problem with contraband tobacco in Latin America.⁹ Brazil not only has faced extensive smuggling across its borders, but at one time only its two major cigarette companies were paying cigarette taxes; 14 smaller companies were not paying the cigarette tax on industrialized products. That represented a US \$280 million revenue loss to the Brazilian government in 2006. Overall, illicit cigarette trade represented 35 percent of the market in Brazil in 2006: 20 percent smuggling from neighboring countries and 15 percent illicit domestic manufacturing.¹⁰

To tackle illicit manufacturing, Brazil required licensing of its manufacturers and implemented a national monitoring system, including equipment to automatically count cigarettes made on every production line and a digital tax-stamp system. The tax stamps, produced in the Brazilian Mint, have a unique code for each cigarette pack. They contain product data for each pack that is uploaded to a Data Manager Server controlled by the Ministry of Finance. With the new system it is possible to quickly distinguish real from fake cigarettes and to verify authenticity of tax stamps on packs.

The Brazilian law directed manufacturers to pay for introducing the system; those costs have been assessed at 1.7 US cents per pack.¹¹ The costs to the government are minimal. A disadvantage of the system is that scanners for reading tax-stamp codes are developed specifically for each supplier of invisible ink and for each country. Outside Brazil, law enforcement officials can not read the codes of the Brazilian tax stamps unless Brazilian authorities supply the scanners.

A similar tax-stamp system was introduced in 2007 in Turkey for cigarettes and alcoholic beverages. It applies both to cigarettes made in Turkey and to legally imported cigarettes. Soon, similar high-tech tax stamps will be used in Canada.

⁷ Betty Yee announces new cigarette, tobacco tax loss estimates. State Board of Equalization, California, news release June 27, 2007.

⁸ Bureau of State Audits, California State Auditor, Board of Equalization: Its Implementation of the Cigarette and Tobacco Products Licensing Act of 2003 Has Helped Stem the Decline in Cigarette Tax Revenues, but It Should Update Its Estimate of Cigarette Tax Evasion (29 June 2006, Report no 2005-034).

⁹ Illicit trade. Euromonitor.

¹⁰ Information collected during a visit, organized by the Brazilian Ministry of Finance and the Brazilian Mint, on the Brazilian high-tech tax stamp system from 16 to 23 May 2007 for a delegation of experts on illicit tobacco trade.

¹¹ Personal communication, Marcello Fish, author of case study on illegal cigarette market in Brazil, 4th December 2007.

Barcodes

Barcodes are familiar to purchasers of various consumer products and for their use in tracking parcel delivery. The first barcodes stored information in patterns of parallel lines of varying width and spacing from each other. The newer two-dimensional matrix code, as it is called, has more data. It stores information in patterns of dots, circles and images.

The European Union reached agreements with Philip Morris International and Japan Tobacco International in 2004 and 2007, respectively, for those major cigarette companies to enact new measures to fight illicit trade. As part of the agreements, both PMI and JTI are marking master cases (containing 10,000 cigarettes each) with a unique barcode that can be read by a person or by a computer; it includes brand category, product variant (a design of a cigarette package for a certain market), production date, place of production, the machinery and the time of manufacturing.

Since 2004 Philip Morris has labeled 200 million master cases with unique barcodes that can be scanned by machines before the cigarettes are sold to the first buyers in the distribution chain.¹² These labels permit linking the barcode with product information on each pack and with information in a central database managed by PMI. Authorized members of relevant agencies in member states of the European Commission have access to the database. Smugglers are aware of the new PMI coding system, however, and can repack the cigarettes in new master cases or cut and remove the barcodes.

The teartape on a cigarette carton—the small plastic tape used to tear open the cellophane wrapping—bears a data matrix code under a tracking program introduced this year by PMI in smuggling sensitive markets such as Russia, Ukraine, Romania and Lithuania. The data matrix code is scanned at a production line and entered into a database. The coded information links each carton and a specific master case.

PMI is experimenting with applying unique codes, based on what is called the Code Verification System (CVS), on each cigarette pack in Germany and Peru. CVS is a 2D barcode scheme; it makes use of an encrypted, serialized 12-character number to identify and authenticate each cigarette pack.¹³ The code has information about the place of manufacturing, the machinery, date and time of production and brand.

So far, the codes on individual packs are not linked to the unique coding on the cartons or master cases, and they are not part of the tracking system for cartons and master cases.

¹² Bacheldor B, Philip Morris Intl. seeks to make serialized bar codes work with EPC network, RFID Journal, October 8, 2007. <http://www.rfidjournal.com/article/articleprint/3668/-/1/1/>.

¹³ Chanez P, Fradet E, Tracking & Security at Philip Morris International, Chicago, October 2007, power point presentation available at <http://autoid.mit.edu/ConvocationFiles/PMI%20-%20EPC%20symposium%20presentation.ppt>.

Japan Tobacco International has put into practice tracking and tracing for cigarette master cases, which bear a machine-scannable and human-readable World Wide Unique Identifying Number. JTI plans tracking and tracking technology at the carton level for 2009.

Other systems

Since May 2005, British American Tobacco products have carried a taggant on the self-adhesive teartape.¹⁴ A taggant is a chemical element added to the ink. It can be recognized by a scanner. This taggant enables BAT to tell whether a product is genuine or counterfeit by using a small hand-held reader to check the teartape.

Since October 2007, all cigarette packs made for the United Kingdom duty-paid market have carried a covert security feature that allows authorities to instantly verify the authenticity of a product on retailers' shelves. Details of the technology are not being disclosed and are the result of a voluntary agreement between industry and government.

In Malaysia, a security mark with a visible feature and an invisible feature has been applied since 2004 on each cigarette pack headed for the domestic market and for duty-free sales. Enforcement officials can scan the mark and discern immediately whether a product is counterfeit. The markings are not linked to tax stamps and do not contain additional data.

A more costly technology than barcodes or invisible ink is radio-frequency identification (RFID). These systems can be used for identification of a product and for tracking. They employ "smart tags"—microchips attached to antennas—and readers that use microwaves. When a smart tag nears a reader, the tag broadcasts information stored in its chip. Readers can scan smart tags automatically when pallets with products bearing the tags pass along conveyor belts and through loading bays.¹⁵ RFID tags cost US 15 cents¹⁶ to US 20¹⁷ cents a tag, and readers cost between US \$100 to \$1000.¹⁸

CONCLUSION

Coding technology is evolving quickly and offers opportunities for governments to control and monitor the tobacco trade, with benefits for public health, nation's economies and public safety. The challenge posed in the

¹⁴ British American Tobacco, Guide to fighting illicit trade, Anti illicit trade unit, September 2005, London.

¹⁵ The best thing since the bar-code. *The Economist*. February 6, 2003.

¹⁶ OCDE, Radio-Frequency Identification (RFID): A Focus on Information Security and Privacy, Paris, 2008.

¹⁷ Pagnamenta R. Cigarettes are microchipped to beat fraud, *The Times*, 8 October 2007.

¹⁸ OCDE, Radio-Frequency Identification (RFID):

tobacco sector is that cigarettes are a mass consumer product and that the coding should apply to 290 billion cigarette packs sold globally each year.

GLOSSARY

- **Barcode** is a way to represent information that can be read electronically.
- **Barcode reader** (or **barcode scanner**) is an electronic device for reading printed barcodes.
- **Cigarette packaging**: a pack frequently contains 20 cigarettes; a carton, frequently 10 packs or 200 cigarettes; and a master case, frequently 50 cartons or 10,000 cigarettes.
- **Counterfeit** products are products that bear a trademark without the consent of the trademark's owner.
- **Covert and overt markings** are markings on packaging that are difficult to see (covert) or visible (overt).
- **Digital tax** stamps are high-tech; they have encrypted data that enable their authentication and the electronic tracking of legally issued stamps.
- **Tracing** means re-creating the route taken by products through their supply chains.
- **Tracking** means monitoring the route taken by products through their supply chains.