

Evaluating the economic impact of Mexico's drug trafficking industry¹

Viridiana Rios
Department of Government
Harvard University
vrios@fas.harvard.edu
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Abstract: By analyzing and gathering quantitative data, this paper presents the first formal economic analysis of the impacts of the drug trafficking industry in Mexico until 2006. The analysis measures the number of drug-traffic employees, the amount of cash and investments generated by the drug-trafficking industry, the monetary costs of violence and corruption, the estimated losses in foreign investment, and the costs generated by local drug abuse. While the authors acknowledge that in some small and less diversified rural communities, drug-traffic cash flows may be helping to alleviate a grinding stage of poverty and underdevelopment, they conclude that the illegal-drug industry generates economic losses of about 4.3 billion dollars annually. Such a high figure is certainly impeding Mexican economic growth and development. Several policy options are considered.

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Introduction

“Sinaloa is and has always been a state where the money comes from drug traffic. Where else can it come from? The fishing and agricultural industries are broken. We cannot even get money from the mineral industry because people do not want to work there anymore. Drug smugglers pay miners ten times more just to take care of drugs (...).What are we going to do if there is no other place to get money?”

Reader of El Debate newspaper (“Será el lavado...” 2007)

It is well known that the drug trade in Mexico represents one of the biggest industries in that country, accounting for as much as \$991 million dollars per year. The 2006 drug seizure of over \$206 million in cash, the fortune of Zhenli Yen Gon, an ostentatious drug smuggler, was approximately equivalent to the whole budget of the Mexican General Attorney Office for three months (CDHCU 2006) and was the largest seizure of drug money anywhere in the world (Shenon 2007).

That the drug trade generates so much revenue in Mexico raises a set of crucial questions about the rationale and efficiency of that country’s efforts to eliminate the industry. If -as some have estimated (Chabat as cited by Anderson 2007)- drug trafficking is one of the ten most important industries of the country, a serious analysis should be undertaken before dismembering it. After all, drug dollars are also dollars and drugs also an industry, one that introduces large capital flows into the country, generating employment, fostering consumption and sprinkling resources to other legal industries [for example, the construction industry of many cities are boosted by the exotic housing preferences of drug smugglers (López 2007)]. In other words, is Mexico winning or losing by having such a successful -but illegal- industry as part of its economy?

An analysis of the aggregate costs and benefits of Mexican drug traffic is absent in the literature. Questions that require analysis include: How many dollars flow into the Mexican economy and to what extent do these flows foster economic growth? Who are the winners of this industry? How do the poor and isolated peasants fair? How are violence, corruption and drug abuse affecting the productivity of the Mexican economy? How much is the country losing by being perceived internationally as the home of world famous drug dealers and corrupted politicians?

By analyzing and reviewing the literature about the consequences of drug trafficking in Mexico, this paper tackles the aforementioned questions, contributing to the formal study of a field that has been relatively ignored. This work has two contributions. First, it evaluates the economic costs and benefits of the Mexican drug industry to determine whether or not it is rational to suppress it. While some studies have evaluated the impacts of drug profits in agriculture (Resa Nestares 2001, Marín 2002), the costs of drug abuse (CIDAD 2004), the costs of violence and crime (Londoño and Guerrero 2000), the cost of corruption (WB 2004) and the estimated amount of general illegal-drug cash flows (Reuter 2001, Toro 1995, Loret de Mola 2001, Resa Nestares 2003), none have evaluated the aggregate economic impact of this industry.

Second, the paper formally analyzes the Mexican drug industry, in particular the profits and revenues generated through its productive chain. Similar analyses have been undertaken in Colombia (Thoumi 1995, Lee 1989, Sarmiento 1991), but not for Mexico. Given Mexico's dominance in the drug industry, such an evaluation is necessary. [almost all the cocaine produced in Colombia enters the US with the help of Mexican cartels (UNODC 2007a), and Mexico produces more marijuana and poppy than Colombia (ONDCP 2003)].

This paper is the first attempt to understand the fight against drug trafficking in Mexico with a formal cost-benefit analysis. Contrary to the US, where anti-drug efforts have been rationally justified in terms of productivity losses (ONDCP, 2000), addiction rates (ONDCP 2003), or the potential costs of alternative policies (e.g. MacCoun and Reuter, 2001; Sabet 2006), the Mexican government has failed to formally frame the reasons for fighting this extremely costly war, offering only vague references to violence and "social fragmentation" (e.g. Informe Presidencial 2006).

The main hypothesis of this paper is that Mexico's efforts against the illegal drug trade are worth the costs because, even accounting for all the economic benefits generated by drug traffic (employment, cash flows and investments), extensive negative externalities (corruption, violence, productivity losses, and increase demand) produced by drug industry generate an aggregate negative impact. The paper also claims that, although in the aggregate drug traffic has had a negative economic impact, drug flows may be beneficial for local, less diversified economies such as Mexican rural communities dedicated to poppy and marijuana production. This is no surprise since drug smugglers represent a critical source of employment, income, and consumption.

This essay is divided into five sections. The first section evaluates the size of the Mexican drug-trafficking industry. It focuses on understanding the business, the main Mexican illegal-drug products, and the share of the US market that belongs to Mexican traffickers. The second part analyzes the economic benefits that the industry generates for Mexicans such as employment generation, capital flows and increased investment. A third part analyses the negative economic impacts. These were categorized in three groups: violence, corruption, and local market development. The fourth section discusses the positive and negative impacts discussed so far in the paper and concludes that the aggregate impact of drug trafficking is negative, except for the case of local, less diversified economies, where drug traffic may have some positive impacts. The concluding section discusses several possibilities for policy and areas for future research.

The scope of the Mexican drug-trafficking industry

Mexico's drug-traffic industry is a highly profitable, diversified business. Concentrated in the production and distribution of three main products -marijuana, cocaine and heroin²-, this industry is the principal exporter of illegal drugs to the US. Currently, approximately 70% of all drugs consumed in the US come through Mexico (Payan 2006). This accounts for as much as 70 percent of the total cocaine consumed,

² Mexican smugglers are involved in the traffic of other illegal substances as well. However, since such substances represent a very small share of the total production, the present work will not focus on them. Future research would be needed for understanding the dynamics of other illegal-drug markets, such as methamphetamine.

between 20 and 30 percent of the heroin, and up to 80 percent of the imported marijuana³ (Andreas 1998).

Out of the three Mexican products, marijuana is not only the most demanded, but also, unsurprisingly, represents the most competitive market. The growth, processing and transportation of the drug is made by several micro and small “firms” without the intervention of major drug cartels (a market tendency identified by Nadelmann (1987)). As a consequence of this large number of small-quantity producers -and in severe contrast with other illegal drug markets- the total amount of seizures come from hundreds of people caught with small loads and not from a small number of large-size seizures (Toro 1995).

The second most important Mexican drug product in quantity is the most important in terms of profits: cocaine. Mexican cocaine profits only come from transshipment services, not from growing or processing. In fact, the cocaine leaf is grown in the Andean region of South America and Mexican cartels are only responsible transiting the drug into to the US. Although Mexican cartels do not take part on the whole cocaine production chain, cocaine is still very profitable because Mexico controls almost all the US market. In practical terms, controlling the US market means controlling the global market: about 90% of world’s cocaine production is consumed in America, mostly in cities like New York where consumption has been estimated at a rate of 90 cocaine lines per 1,000 inhabitants per day (UNODC, 2007b).⁴

Finally, the third Mexican drug product, heroin, is not only transported but also produced in Mexican fields. Inside Mexico, the most important region for the production of heroin is the so-called “golden triangle” formed by the states of Sinaloa, Chihuahua and Durango. Heroin from this region Mexico has captured about one-third of the American market (Andreas 1998). However, compared with the cocaine and marijuana industry, Mexico is a relatively small supplier. According to the latest available estimates, Mexico only produces about 2.17% of the total world consumption (ONDCP 2007); the heroin market is principally dominated by countries such as Afghanistan.

Although the exact amount of revenue generated by these three drug products is unknown, it is clear that illegal drugs are extremely profitable. According to the Drug Enforcement Administration (DEA 2004), a metric ton of pure crack cocaine has a mean retail market value of 138.22 million dollars, much more than the value of the same amount of 24-karat gold. Heroin is even more expensive. A pure metric ton is worth 517.80 million dollars. Multiplying this quantity by the 12.9 tons consumed annually in the US yields a more or less good estimate about how much Americans spend on illegal-drugs: 6.6 billion dollars.

However, accurately estimating the profitability of Mexican drug industry is more nuanced than just measuring the retail cost of illegal drugs. In particular, measuring the size of the Mexican illegal-drug industry is subject to four complications. First, real retail

³ Recent data has shown that 50% of the marijuana consumed in US is grown in American soil, principally in particular houses (Fernández de Castro 2007) As will be explained below, the consumption of homemade marijuana has reduced the demand for Mexican marijuana, yielding important decreases in Mexican illicit drug profits.

⁴ It is important to note, however, that cocaine use has been declining generally in the past 10 years in the U.S., while it has been rapidly increasing in Europe (ONDCP, 2006).

prices are hard to calculate because consumers cannot evaluate the quality of the purchased good. Drug purity tends to vary significantly as the number of intermediaries increases. According to DEA's numbers from 2004, a sale of more than 200 grams of heroin has an expected purity of 70%, while a retail sale of one gram or less is only 37% pure. Cocaine also experiences adulterations: purity goes from 79% when buying more than 750 grams to 65% when buying 100 grams or less. Cocaine adulterations are particularly dangerous: the DEA has found talcum, chalk and even rat poison in some samples.

Second, even when calculating the expected price of a pure gram of cocaine or heroin, price is different across cities and time (Reuter and Greenfield 2001). Variations in prices are significant: a pure gram of powder cocaine is approximately 100 dollars more expensive in New York City compared to Chicago, but buying a pure gram of crack cocaine is 20 dollars cheaper in the former. Acquiring pure heroin in Atlanta is approximately 150 dollars more expensive than in San Diego, but New York City and Chicago have almost the same prices than the border city (DEA 2004).

Third, drug dealers can exercise price discrimination. That is to say, the price of drugs tends to increase with the urgency of getting the product. As addiction increases, costumers are willing to pay relatively higher prices for getting the drug. Such is the case of crack addicts, who have been documented to exchange 0.45 caliber handguns (with a price ranging from \$300 to \$800) for a \$10-cocaine dose (Koper and Reuter 1996).

Finally, even if we could have perfect access to drug prices, retail prices do not tell us much about the share of profits that goes into Mexican hands. To calculate the profit generated by drug traffic one has to estimate not only the expected costs of production, transportation and distribution of the product, but, even more challenging, the share of drug dollars that flow back into Mexico, compared to those captured by other countries that are also involved in drug traffic, i.e. Columbian's cocaine producers, US distributors, and so on.

As the previous discussion showed, estimating the distribution of drug profit among the various actors involved in the production chain can be challenging. In fact, due to a lack of exact information, the majority of the estimates calculate drug income based on retail price, and attribute to Mexicans a share of the total gains. These estimates have to be treated skeptically, as they only represent the total turnover, not the revenues accumulated by Mexican drug cartels along the whole productive chain.

There are several estimates of Mexican traffickers' profits, and all of them have important differences. Anderson (1981 cited by Resa Nestares 2003) estimated Mexican marijuana revenues at 2 billion dollars a year in the 1970s. In the 1980s Nadelman (1988) estimated the revenues generated by both marijuana and cocaine markets at 2 billion dollars, and Reuter and Ronfeldt (1992) -in one of the most serious studies of the time- estimated total Mexican marijuana and heroine profits to be between 2.2 and 6.8 billion dollars. Three years later, Toro (1995) produced a much more conservative estimate: 700 millions dollars for both marijuana and cocaine⁵. In the same year, Coone (as cited by Fazio 1998) estimated the market at 15 billion dollars and asserted that "if

⁵ This very significant difference can be attributed to the fact that she considered that the Mexican drug mafia only kept a minor part of the earnings, while the rest went to Columbian hands.

(drug) dollars flow happens to stop, México's economy could experience a severe destabilization."

More recent estimates have yielded even larger figures. In particular, supply-side estimates –those who try to estimate drug revenues based in the amount of drugs produced in Mexico- have calculated profits from 12 to 80 billion dollars (Payan 2006; US Department of Government as cited by Reuter and Greenfield 2001). According to these authors, the Mexican drug-traffic industry is a crucial sector of the economy. However, it is important to note that these estimates are commonly considered exaggerations because they assume that Mexico is producing and selling ten or more times the amount of drug consumed by the US (Reuter and Greenfield 2001).

The most serious and accurate measure of the Mexican drug industry profits can be attributed to Resa Nestares (2003). He considered deviations in prices, demand, and possible losses due to seizures based mostly on US illegal-drug consumption (but also considering Europe and Canada). This analysis yielded an estimate of profits to be between 3.2 and 9.91 billion dollars.

Figure 1 shows drug profit estimates. The peak of drug traffic industry was in the beginning of the 1990s with annual profits of 9.91 billion dollars. From then on, drug profits have consistently decreased. According to Resa Nestares (2003), two factors account for this phenomenon. The first one is the reduction of Mexican marijuana sales, caused by both the replacement of Mexican products by US-grown marijuana, and the relative decline of marijuana use among youth and adults since the late 1990s (ONDCP, 2006). Second, as the DEA accurately recorded, during the last decade the prices of cocaine, heroine and marijuana have slumped, severely curtailing drug profits.

(Figure 1 about here)

In short, the Mexican drug business can be characterized by a billion-dollar illegal industry that produces and transports marijuana, cocaine and heroin into the US. Estimating the profits of this industry is complex mainly due to differences in regional prices and in the quality of the final product, price discrimination and lack of information about the distribution of profits. However, no matter how much controversy there is between different estimates, the profitability of drug business is clear. In fact, the drug industry is among the top one hundred business of Mexico, doing better than worldly recognized enterprises such as American Express Mexico (CNN 2007). How this highly lucrative industry impacts the Mexican economy will be evaluated in the next sections.

The economic benefits generated by the drug industry

The production of illegal drugs, like any commodity, requires a series of activities and processes to convert raw materials (coca, marijuana leaf, poppy) into final consumable goods that can be delivered to consumers. This production chain passes through several stages, including growth, manufacture, transport and distribution. As the product goes through each of these steps, it acquires added value and generates economic benefits

that impact the Mexican economy as a whole. These economic benefits can be clustered in three main categories: employment, cash flows and investments⁶.

Of the three, employment is perhaps the most visible outcome. In fact, agricultural employment related to drug production has increased over the last decades. In the mid 1970s, it was estimated that at least 50,000 peasants were “narcotics entrepreneurs” (Craig 1980); by the 1980s the estimate had risen to 200,000 (Toro 1995). The last available estimate counts roughly 300,000 peasants are employed in drug production (Andreas 1998).

The very nature of the drug business makes it a labor intensive industry. First, although marijuana and poppy are agricultural products that do not require intensive care –they grow in almost all types of ground and do not require a large supply of water– both crops require a large amount of vigilance, mainly because once the crops are ready for harvesting peasants have to closely guard the field to avoid being robbed. During March and April, when the product is ready to be harvested, theft is fairly common. As Fernández Menéndez and Ronquillo (2006) point out, inhabitants of Guerrero rural towns can tell many violent stories of revenge, all of them with the same details: using violence and weapons, peasants retaliate against robberies of their harvests. The probability of robbery turns out to be very high due to the nature of an illegal market: without any legal property rights, the costs associated with stealing are significantly reduced.

Second, poppies require a large amount of manpower in order to be harvested. The process of harvesting and preparing poppy gum has to be done by hand, without the help of any modern agricultural technology. Hence, it is not surprising that, as with any craft, poppy gum production is labor intensive. In the words of a poppy producer: “We have to plow the land by hand because it [poppy] is cultivated in places where a tractor cannot enter. It is laborious. [...] We have to take care of it, separate the plants in order for them to be very close to others. Similarly, we have to be aware of the plagues, and when it has grown, we have to protect it from the animals that may want to eat it. [Once the poppy is ready], we have to scrape the shell [of the plant] until water comes out. Then, we wait for four or five hours until the water is dry. (Fernández Menéndez and Ronquillo, 2006).”

Third, cultivating in many small areas –as opposed to one unique big area– reduces risks. It has been reported that at least 5% of the poppy and marijuana that is grown in Mexico is actually destroyed by the Mexican authorities (Méndez, 2007). The basic tactic to destroy the crops is to spray them with herbicides using a helicopter. This creates a clear economic incentive for producers: in order to decrease the risk of losing the harvest, harvests should be made in many small crops. Thus the normal size of a poppy and marijuana field is one hectare (PGR as cited by Resa Nestares, 2003). Fields tend not to be larger because, as their size increases, the probability of being caught by the authorities also increases. Moreover, by creating multiple areas for growing illegal-drugs, drug smugglers not only reduce the possibility of being identified by the aerial forces but also decrease the expected amount of losses when they are caught. In

⁶ Although these three indicators are related among each other, they will be discussed separately in order to delve into the analysis.

addition, this tendency toward cultivating many small fields increases the demand for agricultural labor.

Independent from the many incentives created by the labor-intensive drug industry, the more compelling reason to get into the business of producing drugs is a very simple one: revenues. While one kilogram of corn has a market value of four pesos, drug smugglers pay up to 10,000 pesos for one kilogram of opium. In fact, marijuana is six times better business than vanilla (the most well-paid agricultural product of Mexico), and sixteen times better than almond (the second-best legitimate product) (Resa Nestares 2003). Agricultural salaries and other labor benefits are also much better in the illegal market. Peasants are paid a lump sum fee of 400 thousand pesos (around 40 thousand dollars), 300 pesos for each day of labor, and -and even more attractive- smugglers offer peasants a service of “social security” by paying some proportion of the merchandise value if the harvest gets ruined by natural uncontrollable conditions. In contrast, a corn merchant offers a lump sum fee of only 12 thousand pesos with a daily salary of 54 pesos and, of course, no social security (Méndez, 2007)⁷.

The benefits brought by the drug traffic industry in the form of employment generation do not end in the agricultural market. In fact, the drug business requires more workers at other stages of the productive chain. Besides peasants, other common drug-related occupations include chemists, lawyers, managers of laboratories, merchants and transporters. The second most important sector of the drug-traffic industry -in terms of the number of employment generation- is “private security and vigilance.” By these, I mean the agents hired by the drug industry in order to guarantee not only the appropriate completion of trade contracts but also to protect and give personal security to drug smugglers⁸. At the end, drug traffic, like any industry, requires a certain level of security in order to reduce the risk associated to trade. Drug smugglers have had to create a parallel system of contract enforcement because it is impossible for them to take advantage of the official institutions in charge of guaranteeing the compliance of contracts.

In order to institute a certain “rule of law” over their transactions and to protect their business, drug smugglers have hired small armies of youth. These groups receive formal training in the use of violence, a monthly salary of around 10 or 12 thousand pesos, and bonus payments coming from human trafficking, extortions, kidnapping and other crimes (Corchado 2007). The typical member of these gangs is young, urban and male (although some women have participated) (Ravelo 2007).

The most well-documented group of hired assassins in the service of drug trafficking in Mexico is the *Zetas*. Zetas are an elite intelligence group of around 600 responsible for protecting Osiel Cardenas’ organization (Ravelo 2007). Their common tasks include assassinations, transporting small amounts of drugs and protecting street drug dealers, and “rescuing” Osiel Cardenas’s employees and relatives from prison. In fact, Zetas have been responsible for organizing rebellions and escapes in more than five different Mexican prisons (Fernández Menendez and Ronquillo 2006).

⁷ Facing these numbers, the fact that Mexico produces more marijuana than corn? seems not surprising. In 2007, the Agricultural Tribunal acknowledged that, out of the total 31 million hectares designated to agriculture in Mexico, 9 millions were used for the production of marijuana and poppy (Mendez, 2007).

⁸ This scheme of private security has been well documented in other criminal organizations such as the Sicilian Mafia (Van Duijn 2003).

In general, it has been estimated that for each of the 100 peasants working in drug production, there are at least 56 more persons involved in other stages of drug traffic (Lee, 1989). Assuming this rate is accurate, the approximate number of drug employees in Mexico is 468,000, a figure equivalent to almost three times the number of employees of PEMEX, the largest state-owned company in Mexico and the fourth most important oil company in the world. Even more, drug industry employs significantly more people than its main enemy, the Mexican army. The Mexican army, which has as one of its principal duties to fight against drug production and traffic, has 237,800 active members (IISS 2007), about half the number of employees. Comparing the drug industry to other Mexican industries, drug smugglers employ five times more people than the whole timber industry of the country, and between 50,000 and 100,000 more people than the paper and editing industry, the basic-metals industry and the non-metallic industry. As Figure 2 shows, among the eight most important industrial categories of Mexico, drug trafficking would occupy a very respectable fourth place⁹.

(Figure 2 about here)

A second benefit that the drug industry brings to Mexico is its capacity to generate a significant amount of cash flow. As seen in previous section, drug trafficking generates around 9.9 and 3.2 billion dollars annually, encouraging economic activity, e.g., thousands of peasants grow high-value crops, young urban vigilantes receive a monthly salary, corrupted law enforcement double or triple their income, and so on. However, the true economic impact of this flow could be much less than expected due to its very unequal distribution.

The largest share goes to the hands of cartel leaders (Heymann 2007, Reuter and Ronfeldt 1992) that may never reinvest in Mexico, but instead deposit it in international banks that allow secret accounts. A cartel is a family-founded economic organization devoted to drug trafficking. There are seven different cartels that control drug traffic in Mexico: Arellano Felix, Chapo Guzman, Osiel Cardenas, Amezcua Contreras, Carrillo Fuentes, Valencia Valencia and Pedro Diaz Parada. Each cartel represents seven extended families distributed around the Mexican territory, each with a particular influence area¹⁰. Interviews with drug smugglers have pointed out that around 12.5% of the whole profits are kept by cartel leaders (Sarmiento 1991). This would mean that cartels earn between 387 and 1,130 million dollars annually¹¹. A very conservative estimate by Lee (1989) calculates that 50% of the cartel leaders' profits never return to the country. I use this estimate to calculate the total amount of dollars that flow into Mexican economy. Drug traffic generates flows that go from 8.9 to 2.5 billion dollars annually.

⁹ Some studies of the impact of drug labor in Latin America have shown impressive figures. In Bolivia, it is estimated that 10 percent of the working population is involved in illicit coca trade, which generates between \$650 million and \$700 million dollars annually (UNODC 2007).

¹⁰ The two most powerful cartels are the ones lead by Chapo Guzman and Osiel Cardenas. Chapo Guzman's organization, the Golf Cartel, has influence in 17 Mexican states with its base in Matamoros, Tamaulipas. Its rival, the so-called Sinaloa Cartel, is directed by Osiel Cárdenas, famous for being leader on 14 states with its center of operation in northern cities such as Reynosa and Nuevo Laredo (PGR 2005).

¹¹ The fortune of Caro Quintero -ex-leader of the Guadalajara Cartel, now in prison- has been estimated around 450 million dollars, money that he offered as a gift to pay Mexico's foreign debt in exchange of his liberation (Andrade Bajaras, 2007).

A third way in which drug traffic benefits the economy is generating investment. As Mario Arango showed (cited by Lee 1989) by interviewing high and medium level Colombian drug smugglers, the investment portfolio of traffickers normally consists of real estate (about 45%), cattle (about 20%) and other forms of legal commerce (about 15%). It has been documented that the traffickers' demand for luxurious housing has significantly benefited the construction business (ONDCP 1994, Lee 1989), by constantly requiring these services and increasing demand for construction materials. Andrade Barajas (2007) reported the same investment profile for Mexican cartels. Apparently, Mexican traffickers enjoy building churches and extravagant mansions. This inclination has generated economic benefits for some local construction businesses that increase their sales and profits by servicing drug-lords.

Moreover, there is evidence that the benefit does not only come from high and medium-level drug smugglers. Even peasants, who occupy the lowest position in drug-trafficking hierarchy, reportedly invest their money in productive assets. According to one peasant: "Some give good use to the money obtained from poppy growth. Some construct houses, buy cattle, animals, save to go working to the other side [of the border](...)" (Fernández Menéndez and Ronquillo, 2006).

To summarize, employment, capital flows and investment are the main economic benefits of the drug industry. It employs about 468,000 persons, mostly in agriculture production and security. Agricultural employees particularly benefit from drug production because they have few alternative sources of employment. Drug trafficking also generates important capital flows that trickle down to all the persons that participate in the business. Part of this money goes back into Mexico in the form of legal investments, but another part stays in international banks. It is clear that these investments create multiplier effects in the economy that, in the best scenario, promote economic growth. However, the exact share of profits that return to Mexico is unknown.

The economic costs imposed by the drug industry in Mexico

In general, industries are perceived to be positive externalities for the economy for two reasons. First, increasing the number of industries reduces the risk of sharp economic declines (Kalemil-Ozcan, Sorensen, and Yosha 2003). Second, firms look for - and promote- a stable investment environment. (Beltrán and Salcedo-Albarán 2007). Although drug traffic certainly satisfies the first condition –it is helpful to diversify the economy- what differentiates drug industry from other legal industries, and what makes it a negative externality for the economy, is the type of critical resources that it needs to succeed (Beltrán and Salcedo-Albarán 2007). Instead of requiring strong political institutions and promoting a peaceful investment environment, drug traffic benefits from government corruption and tends to promote violence and public demand for drugs. This set of externalities can be classified in three main categories: the generation of violence, the promotion of corruption and the creation of local drug markets.

The negative impact that violence has on economic stability has been well documented. Actually, there are a number of ways in which violence results in direct and indirect financial costs: the loss of productivity associated with death or injury, the loss of human capital investments and the costs of medical care and legal services (UNODC 2007a). In addition, the psychological harm associated with violent experiences has a

significant impact on the economy. Fear of violence can cause people to withdraw from social interaction in order to protect themselves. This manifests itself in some very concrete ways. There are many opportunity costs involved in living a life designed around avoiding criminal vulnerability. Some people simply refuse to go out at night or to make use of public transportation, which may limit access to productive and educational activities.

Violence also fosters migration. Studies of Sinaloa's migration flows -one of the major centers of drug trafficking in Mexico- has shown that drug-related violence has generated the migration of at least 360,000 inhabitants, leaving ghost towns all around the region (Lopez 2007). Tamaulipas has experienced the same phenomenon. Residents and local business constantly leave Tamaulipas' capital, tired of trafficker's extortions. In the last few years, more than a dozen businesses have relocated to the US (Corchado 2007). This is particularly hazardous for the Mexican economy because violence discourages investment. Transnational corporations do not want to invest personnel in an environment in which they may be in jeopardy or in which they would have to pay hazardous-duty salaries (WB 2004).

Although it is difficult to calculate how violence is impacting economic development, a good proxy is the study by Londoño and Guerrero (2002) which measures the economic costs of violence and crime in Mexico¹². According to the authors, total economic losses are 12.3% of the total Mexican GDP (Londoño and Guerrero 2000, WB 2004). Of course, not all violence and crime are related to the drug business. Assuming that only a proportion of the crimes are drug related, the total cost of drug traffic goes from 0.43 to 1.43 billion dollars annually¹³.

Second, drug traffic can also be considered a negative externality because it fosters corruption. Drug traffic is well known for corrupting authorities from all levels in the government hierarchy. The links between traffickers and Mexican police, prosecutors, judges and politicians are not a secret (Sarmiento 1991, Blancornaleras 2002, Fernández Menendez 1999, Fernández Menendez and Ronquillo 2006, Shelley 2001, and Chabat 2006). In fact, it has been documented that a significant part of drug revenues goes into the hands of corrupted politicians (Corchado 2005). Even president Calderon himself has accepted that organized crime has tried to extend its power to the political arena, either by funding, intimidating or impugning the electoral processes.

¹² To calculate the economic costs of crime and violence, the authors identify four components: health losses, material losses, consumption and labor declines, and transferences among people. Health losses are integrated by (1) the costs of medical attention related to violence, and (2) the estimated productivity losses due to death or incapacity. Material losses are expenses in (3) private security and also (4) inversion decreases due to violent environments. Consumption and labor declines reflects the reduction in (5) consumption and (6) labor associated with violence. Transfers among people refer to (7) damage to the economic patrimony.

¹³ To estimate the cost of drug violence and crime author estimates the share of crimes related to drug traffic and multiplied it by Lodonno and Guerrero (2000) estimates. Two proxies were used to estimate this share. First, percentage of total denounced crimes that were related to illegal drugs (DEN) (Presidencia de la República 2007), and (2) percentage of total professedly committed crimes that were related to illegal drugs (PRO) (INEGI 2007b). Both estimates yield very similar results, but DEN was calculated only from 2000 to 2007, and PRO was calculated only from 1989 to 2006. When DEN and PRO are available, the estimate used was the mean between the two indicators. When only PRO available, PRO was used as the estimate. When only DEN available, the estimate used was the mean between DEN and the expected value of PRO from 2000 to 2006. Annual GDP (INEGI 2007a) was transformed to dollars using the mean exchange rate of each year (INEGI 2007b).

The corruption of Mexican institutions by the drug industry imposes severe economic costs. To begin with, a corrupted judicial system reduces competitiveness. Corruption increases the cost of making business because contract compliance becomes less credible. This high uncertainty acts as a constraint for business implementation, reducing the investment attractiveness of the country and its ability to compete in the global markets. Indeed, the impact of corruption in competitiveness has proven to be very significant (Kaufmann 2005). Therefore, it is not surprising that corruption is negatively correlated with the level of aggregate investments and economic growth. As Mauro's (1995) influential paper discovered, aggregate investment is 5% lower in countries identified as being corrupt. Assuming this estimate is correct, the perception of Mexico as a corrupt country translates into losses that go from 0.01 to 1.66 billion dollars annually (See appendix A).

Corruption also generates additional negative externalities such as a vicious cycle of increasing criminality (Beltrán and Salcedo-Albarán 2007), a reduction in free press (Kauffman 2000, Corchado 2007), a curtailment in government productivity (Kaufmann 1997), and even distortions on governmental social spending (Mauro 1995).

Finally, there is still a third way in which drug traffic is negatively influencing Mexican economy: the creation of local drug demand. The negative impact of drug abuse becomes especially clear when the inevitable spillover effect of rising consumption is taken into account (ONDCP 1998). This increase is related to the fact that drug smugglers are prone to pay their employees in kind (ONDCP 1994). Paying with merchandise not only opens the possibility to expand demand, but also avoids the difficult process of having to clean the money to bring it back from the US.

Wherever drug industry is located, it promotes drug use. Mexico is no exception. Cocaine consumption has risen sharply during the last decade. The Mexican Minister of Health estimated that, from 1988 to 2002, consumption increased 375% (SSA, 2002) – one of the largest prevalence increases in the world. About 3.5 million Mexicans have consumed some type of illegal drug at least once in their lives, and 16.2% of these are frequent consumers¹⁴. Considering the whole population, 3.5% have consumed marijuana, 1.4% cocaine and 0.6% inhaled drugs (SSA 2002).

Drug abuse has direct economic costs in terms of productivity and human capital losses, health care (both treatment and prevention), and government expenditure (policies to prevent or treat drug consumption). Productivity losses are related to spending time in prison, and death or permanent lesions induced by drug consumption. The subjectivity of this type of cost makes it difficult to measure, but there have been several fairly good attempts. For example, a study of Egypt, Mexico, Namibia, Poland and Sri Lanka found that substance abusers have 2 to 4 times more accidents at work than other employees, and are absent 2 to 3 times more often (ONDCP 1998). Much more evident and identifiable are the health care costs. They involve the prevention and the treatment of drug addicts by private and public hospitals. Finally, there are also costs associated with operating policies to prevent and control drug consumption.

The best estimate of total costs of drug abuse in Mexico is the one calculated by CIDAC (2003). The latest figures available estimate drug costs to be around 0.68 billion

¹⁴ A frequent consumer has been defined as those who had consumed illegal drugs the month before they were interviewed.

dollars annually (CIDAC 2003). The larger share of this cost is attributed to productivity and human capital losses. In 2003 alone, productivity losses due to incarceration cost 124.63 million dollars annually, equivalent to the budget of the whole Mexican Presidential office. Moreover, the Mexican government spent 14.6 million dollars just in policies to control drug demand, money that otherwise could be spent on much needed poverty and housing relief.

Up to now I have summarized the costs of drug abuse in three major categories: violence, corruption and drug abuse. However, there are many costs that cannot be appropriately measured. MacCoun and Reuter (2001; *Drug War Heresies*) identify over 50 harms that result in drug use or the implementation of drug policy (Table 1)¹⁵. Some of these harms are frequency-based, or have a risk of occurring each time drug use occurs. Others are invariant harms, occurring each time a policy decision is made. Additional harms not listed in this taxonomy include free press limitations, migration, or interference of drug-money in political campaigns.

(Table 1 about here)

Adding up: the economic impact of drug traffic industry in Mexico.

Previously, I discussed the positive and negative economic effects of drug trafficking. In section II, I talked about the economic benefits of the drug industry. Drug trafficking is economically beneficial because it generates employment, consumption and investment. First, almost half a million people receive a monthly salary from the drug industry, and out of these, 300,000 are peasants who have few other feasible sources of income. Second, according to the latest estimates, drug traffic generates around 2.78 billion dollars that are distributed among the people involved in the industry (specially favoring drug cartel leaders). A share of this profit is reinvested into the Mexican legal economy, principally in housing and cattle. Although the exact amount of reinvestment cannot be calculated, I estimated that about 50% of all drug cartel leaders' profits come back to the country. This accounts for a return rate of 90% and real cash flows of 2.5 billion dollars annually. In section III, I discussed the economic costs of drug industry. In general, drug traffic brings negative consequences to the economy because it increases violence, corruption and local drug abuse. Drug violence has forced the migration of thousands of families and businesses out of drug traffic states, and has reduced the productivity and created psychological damage to those who have stayed. The most recent estimated cost of violence is 1.07 billion dollars annually. Additionally, corruption has generated an investment loss of about 1.3 billion dollars annually. Finally, drug abuse generates an annual loss of 680 million dollars due to losses of productivity and addiction treatment. Other negative consequences of drug traffic cannot be measured.

Adding up, the costs of the drug industry exceed the benefits. As Figure 3 shows, in 2004 the costs of drug traffic were almost 2 billion dollars higher than the benefits. However, this has not always been the case. Before 1999, drug cash flows and investments generated more benefits than the costs associated with this illegal industry.

¹⁵ The costs of these negative consequences can be very high. However, due to a practical impossibility in assigning them a value, I assumed that these type of immeasurable costs could increment real cost by as much as 50%.

As stated in sections II and III, the growth of the costs and the reduction in the benefits can be satisfactorily explained. On one hand, the negative costs of drug traffic for Mexico have increased over the years because the number of crimes related to drugs, and the number of Mexicans that consume illegal drugs have increased. On the other hand, the benefits of the illegal-drug industry have been decreasing due to a decrease in the price of drugs and a decrease in the share of the marijuana market that is dominated by Mexicans.

(Figure 3 about here)

This finding yields a very important practical conclusion: Mexico's war on drugs must continue because diminishing drug traffic will be economically beneficial for the country as a whole. By fighting drug traffic, the Mexican government is not only fighting against illegality and corruption, but against a negative economic externality that is affecting all other markets.

However, it is important to recognize that, although in the aggregate drug traffic appears to have a negative economic impact, drug flows may be beneficial for some local, less diversified economies, such as the small and isolated Mexican rural communities dedicated to poppy and marijuana production. In such places, drug smugglers are a critical –if not the only- source of employment, income and investments.

In fact, many experts have documented the positive economic impact of drug traffic in isolated communities. Marin (2002) showed through extensive field work in municipalities of Sinaloa that there are numerous rural local economies that, unable to compete in the international agricultural markets, have managed to survive due to drug revenues. Arencillas ("Permea..." 2006) also found that in some communities "drug traffic activities have improved the precarious economic conditions by opening the possibility of production (...). That is why drug organizations are considered heroes." Even Mexican local authorities, such as the municipal president of Badiguarato, Sinaloa, have acknowledged the fact that in some municipalities almost 30% of the population makes a living out of drug traffic (Astorga 1995).

Moreover, a historical example of the strong economic dependency that some rural communities have developed around the drug industry was documented during DEA's "Operacion Condor (also known as Operation Trizo)." In 1976, the DEA and the Mexican government put into operation the most important bilateral mission to reduce poppy and marijuana cultivation in the north of Mexico (DEA 2003, Astorga 1995, Robbins 2005). The operation called for Mexican nationals to fly helicopters donated by the U.S. State Department to spray herbicides over poppy fields in the states of the golden triangle. The operation was successful and managed to significantly reduce the amount of drug being grown in the region but, after a short period of time it was suddenly stopped. According to the DEA (2003), the main reason for the Mexican authorities to terminate this very successful operation was an economic one: the abrupt stop of drug income created severe economic destabilization into the region.

Indeed, the large majority of individuals that get involved in drug production do so because they need the money¹⁶ (ONCDP 1998, Marin 2002, WDP 2007). Therefore, it is not surprising that the common denominator of all the Mexican drug producing counties is poverty. As Table 2 shows, the proportion of the population without a source of income is 30% higher in municipalities where drug production is intensive, and the percentage of the population without any formal education is 7% higher. The “index of marginalization” also shows significant differences. Mexican counties with the highest number of drug peasants per capita have a marginalization index 0.744 lower than the counties that are not related to any illegal agriculture. This is to say, the average drug-producing municipality is closer to San Luis Potosí, while the average non-producing municipality is similar to the much more wealthy state of Tlaxcala.

(Table 2 about here)

In particular, the drug industry has been a very important source of income for places that lack basic vital services. Drug producing peasants live in towns with poor infrastructure. The percentage of households without basic services is significantly higher in the counties with highest number of drug crops compared to the non-producing ones: running water (8.14% more), drainage (11.47% more), electricity (9.81% more), sanitary (13.52% more), appropriate roof material (4.82% more), and electric or gas stove (13.56% more).

Such a deficit in basic services is normally correlated with a lack of economic diversification and sources of employment because scarcity of infrastructure tends to boost firms’ fixed costs and increases the time necessary for companies to build plant capacity.

Conclusions and policy implications

This paper has analyzed the costs and benefits generated by the drug industry in Mexico. Such an analysis was needed in order to rationalize the debate of whether the Mexican government should continue its war against drugs, or should better accept that the drug industry was beneficial for the economy.

In general, drug traffic inserts into the economy generating both positive and negative impacts. On one hand, the benefits of drug industry can be clustered in three big categories: employment, cash flows and investment. According to my estimates, the drug industry employs 468,000 people and is responsible for annual cash flows and investments of 2.5 billion dollars. On the other hand, drug traffic brings negative consequences to the economy because it increases violence, corruption and local drug abuse. According to my estimates the cost of violence is equivalent to 1.07 billion dollars, investment losses accounts for other 1.3 billion, drug abuse generates a loss of 0.68 billion dollars, and other costs may have an impact as high as 1.5 billion dollars.

¹⁶ The Mexican government itself has recognized that poverty is in fact the main trigger for illicit drug production. According to a study realized by the Mexican General Attorney office, the motivation of every 6 out of 10 of all the criminals sentenced due to the agricultural production of drug was economic necessity. In fact, the mean income of the sentenced producers was about 20 pesos per day *La Jornada*, 5 de abril de 2000 as cited by Resa Nestares 2003).

Taking these multiple factors together, the illegal drug industry has a negative impact in Mexican economy.

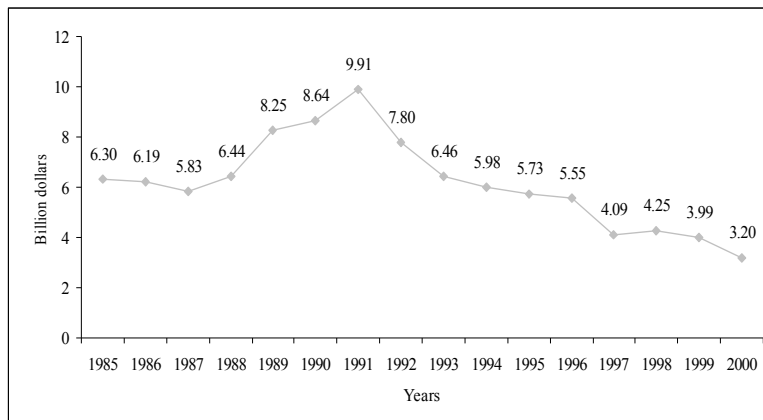
Although in the aggregate drug traffic is generating negative economic consequences for Mexico, it is important to acknowledge that drug traffic cash flows are in fact helping some Mexican communities to somehow alleviate a grinding stage of poverty and underdevelopment. In fact, for almost all drug-producing communities, the drug traffic industry seems to be the only source of income.

What policy implications does this have? The most obvious one relates to increased employment efforts in impoverished regions within Mexico. Our analysis has confirmed the long-held notion that most actors in Mexico's drug economy participate in such a business because of the lack of economic opportunity – not a unique phenomenon in the drug-producing world (e.g. Afghanistan). This has special implications for the U.S. since the current state of widespread calls for alien migration back to Mexico action might trigger an increase in drug production. If the economic situation of these communities does not improve, getting involved with the illegal-drug industry will remain to be very attractive. Of course the best employment programs cannot function in an environment of corruption. As briefly discussed above, this remains a major issue holding back Mexico from achieving greater economic and social success. The international community must continue to pressure Mexican leaders for more transparency in government. This includes monitoring money laundering activities more closely.

Greatly reducing the drug trafficking industry in Mexico may seem like an insurmountable, naïve goal in overall drug control. But previous successes of sharply reducing that business in other countries – like Thailand, Laos, and Colombia – offer a glimpse of hope. Doing so would require a rededicated, multi-pronged effort consisting of poverty relief, alternative development, and anti-corruption measures from the United States and other countries. This might require great cost, but the price of doing nothing would probably be more.

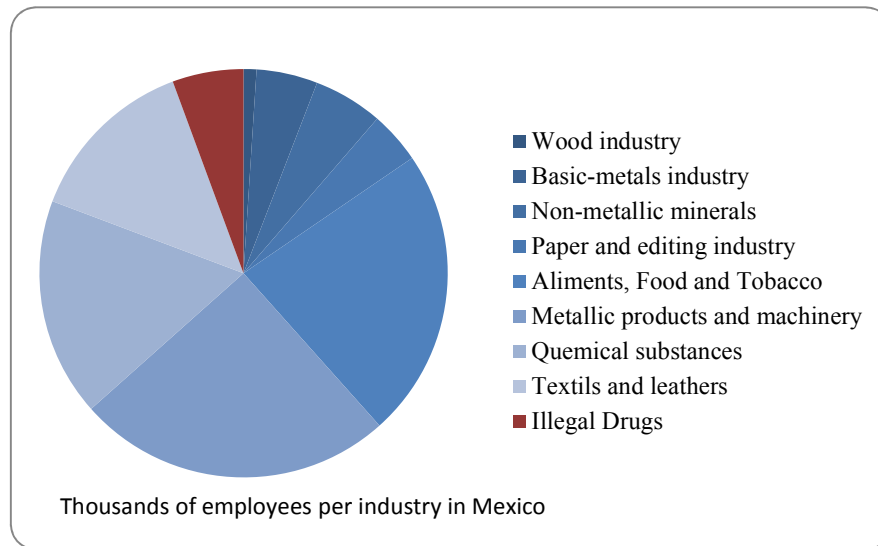
Figures and Tables

Figure 1: Annual profits of Mexican illegal-drug industry.



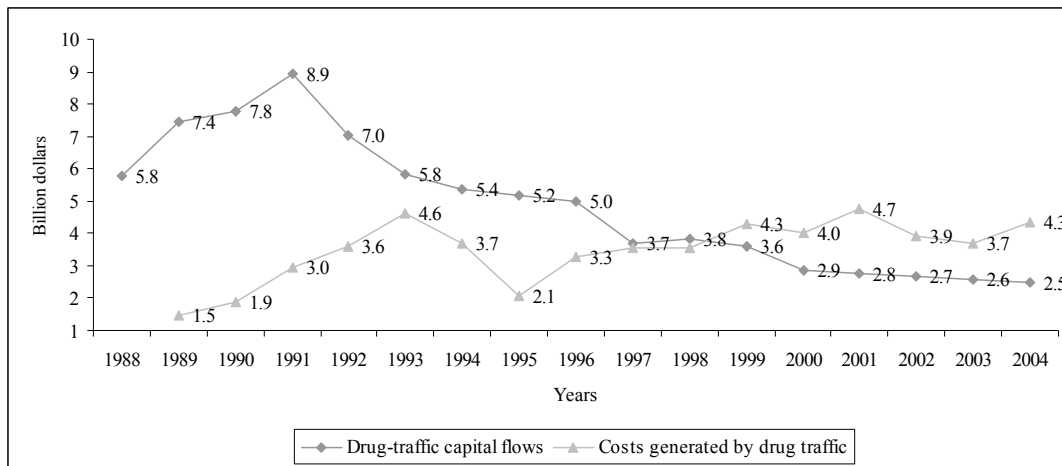
Source: Resa Nestares, 2003.

Figure 2: Employees in drug production and in other five major industries in Mexico.



Source: Legal manufacture workers were reported by Aregional 2007 as part of the national economic census. Number of employees dedicated to drug production corresponds to the official agricultural data reported by the Mexican Office of the General Attorney (PGR as cited by Andreas 1998) plus author's estimation of other drug-related employments. Author's estimation is based in Lee 1989. The last official report of drug agricultural employment comes from the nineties, therefore the number of employees of other industries were extracted to match such data (July 1995).

Figure 3: Cost-benefit analysis of drug-traffic industry.



Source: Author with data of Resa Nestares 2003, Juarez 2006, Mauro 1995, CIDAD 2004, Lodono and Guerrero 2000, INEGI 2007a, INEGI 2007b, and Presidencia de la Republica 2007.

Note: From 2002 to 2004, capital flow estimates are given by the mean change in profits over the whole period. It is assumed that half the money earned by drug cartel leaders does not come back to the country (for a discussion on this topic see Lee 1989). In addition, author assumed that 50% of the total costs of drug traffic industry cannot be measured by conventional means. To estimate the cost of drug violence and crime author estimates the share of crimes related to drug traffic and multiplied it by Lodono and Guerrero (2000) estimates. Before 1997, and after 2003, estimates the costs of drug abuse are given by the mean change in costs of drug abuse. All data is available upon request.

Table 1: Taxonomy of Drug-Related Harms

Health care costs (public or private)	Fear, restricted mobility
Suffering due to physical/mental illness	Sense of public disorder, disarray
Addiction	Reduced property values near markets
Effects of maternal use on infants	Observably widespread violation of laws
Disease transmission	Increased police/court/incarceration costs
Prevention of quality control	Preempting of scarce jail/prison space
Loss of incentives to seek treatment	Court congestion and delay
Restriction on medicinal uses	Police invasion of personal privacy
Reduced performance, school/workplace	Corruption of legal authorities
Poor parenting, child abuse	Demoralization of legal authorities
Influence on others' using	Violation of the law
Harm to self-esteem	Devaluation of arrest as moral sanction
Harm to reputation	Interference in source countries
Harm to employability	Strained international relations
Accruing criminal experience	Fines
Acquaintance with criminal networks	Times and income lost (in court, prison)
Elevated dollar price of substance	Legal expenses
Infringement on liberty and privacy	Stigma of criminal, prison record
Prevention/restriction of benefits of use	Fear of apprehension
Accident victimization	Violence
Property/acquisitive crime victimization	

Source: Adapted from MacCoun & Reuter, 2001, pp. 106-107)

Table 2: Socioeconomic characteristics of the 100 Mexican municipalities with the highest number of illegal drug crops and the highest drug peasants per capita.

Socioeconomic characteristics	The 100 Mexican municipalities with the highest number of		Municipalities non-related to illegal drug agriculture
	Illegal drug crops	Drug peasants per capita	
General development indexes			
Human Development Index	0.649	0.643	0.697
Margination Index	0.587	0.724	-0.020
Percentage of households without basic services			
Running water	33.62%	34.28%	25.48%
Drainage service	60.04%	62.80%	48.57%
Electricity	19.73%	25.65%	9.92%
Sanitary service	33.50%	37.28%	19.98%
Appropriate roof material	12.88%	12.99%	8.06%
Electric of gas store	61.80%	67.74%	48.24%
Household income			
Less than two Mexican minimum salaries per month	20.09%	20.06%	30.55%
No income	37.53%	40.82%	27.91%
Education level			
Without education	22.16%	21.49%	15.36%
Without primary school education	50.37%	53.81%	44.58%
Without secondary school education	79.13%	83.59%	74.98%

Source: INEGI (2000), CONAPO (2000), PNUD (2004), Resa Nestares (2001).

Note: Data refers to poppy and marijuana only. The 100 municipalities with the highest number of illegal crops and the highest number of peasants per capita were estimated by Resa Nestares (2001) using hectares eradicated as a proxy of hectares cultivated with illegal drugs.

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