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Scarcity without Leviathan

The Violent Effects of Cocaine Supply Shortages in the Mexican Drug War

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According to Thomas Hobbes, in a world without the rule of law, where the state does not have a monopoly on violence and where no reliable third party can enforce laws and contracts, the life of man becomes “nasty, brutish and short.” The rule of law and a central authority’s monopoly on violence—the Leviathan—are essential requirements for the absence of conflict and violence. Contemporary writers like Steven Pinker also argue that the rise of the Leviathan was one of the main driving forces behind the decline in violence during the last millennium. The logic is simple: outside the rule of law, there is no reliable source of third-party enforcement and property rights are poorly defined; wealth and assets can be appropriated by others through the use of force, so violence becomes a rational choice. The exercise of violence not only allows people to prey on others but it also protects them from potential predators.

Despite the great expansion of the state and its monopoly on violence since Hobbes’s times, several regions, markets, and periods still lie outside the scope of the Leviathan. In these contexts, violent appropriation and private protection are the rule rather than the exception. In many developing countries, local strongmen contest for areas that have no monopoly on violence by the state while warlords fight over the extraction and control of valuable resources without well-defined property rights. Markets for illegal goods

also lie outside the scope of the Leviathan because the state cannot provide a legal framework for third-party enforcement. Illegal drug markets in Colombia, Mexico, and Afghanistan are all ruled by illegal armed groups that resort to violence in order to solve disputes and protect de facto property rights. The scale and salience of violence may vary, but any markets with poorly defined property rights will be constantly subject to violence regardless of the type of goods being transacted.

We research the role of scarcity in environments lacking reliable third-party enforcement. By third-party enforcement we refer to a situation wherein market participants are subject to the state’s monopoly of violence while property rights and contracts are enforced in an impartial and reliable way. The intensity and salience of violence in these environments vary, making it important to understand their determinants. We study the role of scarcity—supply shortages—as one important factor that exacerbates the use of violence in these environments. Our basic intuition is that scarcity increases violence if the demand for the goods produced and transacted is inelastic: a decrease in supply causes a greater increase in prices, thereby increasing total revenues and leading to more predation and violence as participants contest the larger rents. Thus in the absence of reliable third-party enforcement, markets with highly desirable goods and commodities in short supply exhibit more violence.

We study the role of scarcity in the context of Mexico and the cocaine trade. This market suits our purposes for several reasons. First, cocaine production is illegal, meaning that the state cannot act as a source of reliable third-party enforcement and market participants must enforce property rights and contracts on their own. Second, cocaine is a highly desirable commodity with an inelastic demand. Third, changes in enforcement in cocaine-producer countries—in our case, Colombia—create scarcity in transit countries and downstream markets, increasing revenue and violence.

The combination of these factors has nurtured extreme violence wherever the cocaine market has flourished. Mexico is the most recent example: as the cocaine trade expanded, there was a dramatic increase in violence; the homicide rate in 2010 was almost three times that of 2005. Most of this surge in violence can be attributed to confrontations either between different drug cartels or between cartels and Mexican authorities. In 2007, there were 8,686 homicides in Mexico, out of which 2,760 were estimated to be drug related; in 2010, there were 25,329 homicides, out of which 15,258 were drug related. Since 2006, there have been more than 60,000 drug-related killings in Mexico, a greater death toll than that observed in Afghanistan since 2001 (estimated to be between 30,000 and 45,000 since 2001).

Mexico has been the main point of entry for drugs entering the United States since at least the turn of this century. Illicit drugs produced in the Andean countries, most importantly cocaine, used to be shipped to North American markets through the Caribbean. But following intensified enforcement in the Caribbean by U.S. authorities, Colombian and Mexican drug traffickers began to use the Mexican route more frequently to smuggle drugs. Since then, struggles between cartels striving to control drug-trafficking routes have become a major source of violence in Mexico. Since Mexico does not produce cocaine, the industry behaves like a vertical market. Mexican cartels purchase cocaine from producers in Colombia, and to a lesser extent in Peru and Bolivia, then smuggle it across the U.S. border using a variety of imaginative techniques. For instance, the Sinaloa cartel uses underground tunnels and catapults to throw drug packages across the U.S. border, where their men pick them up on the other side.

We ask whether the surge in drug-related violence in Mexico since 2006 is related to cocaine supply shortages caused by larger and more frequent cocaine seizures in Colombia. Cocaine seizures in Colombia curb supply in downstream markets and increase revenue because of an inelastic demand. This triggers a violent competition between cartels

to control the additional rents. In 2006, the Colombian government redefined its anti-drug strategy, emphasizing the interdiction of drug shipments and the detection and destruction of cocaine-processing labs over the eradication of coca crops. This caused a large increase in cocaine seizures that went from 127 metric tons in 2006 to 203 metric tons in 2009. As a result, the supply of Colombian cocaine fell from 522 to 200 metric tons in this period and varied significantly from month to month depending on the success of interdiction operations. This large negative supply shock was noticeable throughout the region and even in cocaine street prices in U.S. retail markets. More precisely, the price per pure gram of cocaine went up from about \$135 in 2006 to about \$185 in 2009 for purchases of two grams or less, and from \$40 to \$68 for wholesale purchases between 10 and 50 grams.

We test the hypothesis that the scarcity created by larger and more frequent interdiction events in Colombia exacerbated violence in Mexico since 2006, during the so-called Mexican Drug War. To guide our empirical analysis, we present a model of illegal drug markets but with general insights for other markets without third-party enforcement. In our model, exogenous supply reductions in upstream markets increase revenue, assuming demand is inelastic. As a consequence, drug cartels invest more in the fight over the control for the higher rents, increasing the level of violence. Violence may take several facets: cartels may fight for turf when its control commands higher rents, they may expropriate other cartels' assets and cash, or they may extort other cartels receiving higher revenue. Our model also shows that the effect of cocaine shortages on violence is greater (1) in places with at least two cartels; (2) in places where more frequent arrests and crackdowns against cartel leaders increase turnover, and hence informal cooperation arrangements cannot sustain less violence; and (3) in places where drug trafficking is more intense (e.g., in northern Mexico).

We test these predictions using monthly data for Mexico from December 2006 to December 2010. We exploit the fact that cocaine is produced in the Andes—mostly in Colombia—and as a consequence, cocaine seizures in Colombia provide an external source of scarcity in the Mexican markets. These seizures affect the Mexican cocaine market only through scarcity, unlike seizures in Mexico, which affect cartels through many other channels. Figure 1 shows that the rise of violence in Mexico since 2006 coincides with the sharp decline of cocaine supply in 2006. But it would be naive to interpret this as evidence of a causal effect of scarcity on violence; this long-term correlation could simply reflect a change in policies in both countries after 2006 (the Mexican president Felipe Calderón's

war on drugs in his country and the emphasis on interdiction policies in Colombia). In order to overcome this difficulty, we exploit monthly variation in cocaine seizures in Colombia as a source of shocks to scarcity in Mexican cocaine markets. The key identifying assumptions are that the potential coincidence in timing between policies in Mexico and Colombia breaks down at higher frequencies once we flexibly control for long-term time trends, and that other determinants of violence in Mexico are not correlated with interdiction efforts in Colombia at high frequencies. Our interpretation also hinges on the assumption that seizures in Colombia only affect Mexican drug markets by creating scarcity.

We find that violence increases in Mexico during months with supply shortages caused by temporal increases in cocaine seizures in Colombia. We also find that violence increases particularly in places near the U.S. border. Violence increases more in municipalities with cartel presence, but

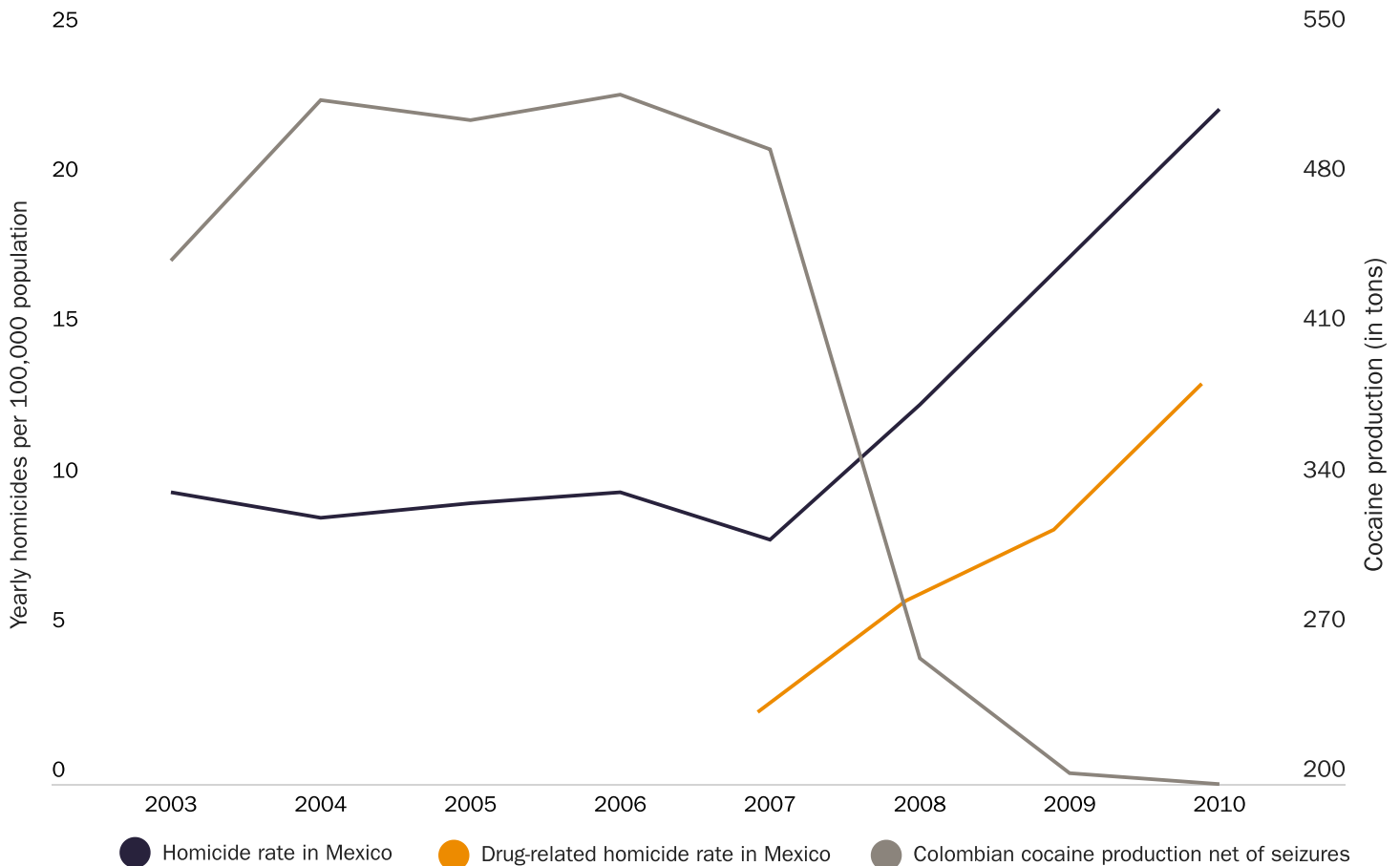
only in those with two or more cartels or with two or more nonallied cartels operating at the time of the supply shock. Finally, the effects are larger in municipalities that have historically supported PAN, the party of Calderón (whose term lasted from December 2006 until November 2012).

Because these municipalities were more likely to support federal government efforts against cartels in their area, the turnover of cartel leaders was more frequent, precluding informal cooperation arrangements and amplifying the effect of scarcity on violence. The fact that the effect of cocaine seizures in Colombia on violence in Mexico is mediated by these variables suggests that the effect occurs through both scarcity and the fights among cartels contesting the higher rents it creates.

Our evidence shows that Colombian cocaine supply shocks created scarcity and contributed to the increase in violence in Mexico. Our preferred estimates suggest that a 1 percent increase in monthly cocaine seizures in Colombia

Figure 1

Homicide rate in Mexico and net cocaine production in Colombia, 2003–2010



Note: The total homicide data is provided by Instituto Nacional de Estadística y Geografía and the drug-related homicide rate is from the President's Office of Mexico. Net production is defined as potential production minus seizures, and is computed from the United Nations Office on Drugs and Crime cultivation and productivity figures and official seizures statistics.

increases the homicide rate in all of Mexico by about 0.059–0.091 percent, by about 0.082–0.106 percent in municipalities in the first and second quintiles of distance from the U.S. border, and by about 0.119–0.161 percent in municipalities in the first quintile of distance from the U.S. border. Under additional assumptions mentioned in the text, our estimates imply that the sharp decline in the net cocaine supply from Colombia between 2006 and 2009 (from 520 to 200 metric tons per year) accounts for about 10–14 percent of the increase in the homicide rate in Mexico during the same period and for 25 percent of the differential increase in violence observed in the north of the country relative to the mean.

Beyond our interest in the Mexican case in and of itself, documenting the role of scarcity in markets lacking reliable third-party enforcement is important for two main reasons. First, it sheds light on the nature of the associated violence. The fact that cartels respond to economic incentives in the manner predicted by economic theory means that violence is a rational choice made by agents motivated by profit or greed. Once the nature of violence is recognized, better policies can

be designed. Furthermore, since scarcity increases violence by raising revenues, policies that reduce revenue and limit the incentives to prey are the best alternatives to actually enforcing property rights adequately. A second reason is that many well-intended policies that increase scarcity in markets with poorly defined property rights may end up increasing violence. For instance, limits on formal mineral extraction—of gold or diamonds, for example—create scarcity and increase prices. Supply reduction policies implemented under the War on Drugs also create scarcity. Likewise, commercial restrictions to trade in certain resource-abundant countries with poor institutions could increase rents and violence.

NOTE:

This research brief is based on Juan Camilo Castillo, Daniel Mejía, and Pascual Restrepo, “Scarcity without Leviathan: The Violent Effects of Cocaine Supply Shortages in the Mexican Drug War,” *Review of Economics and Statistics*, December 2018, https://www.mitpressjournals.org/doi/pdf/10.1162/rest_a_00801.