Prohibition and the Market for Illegal Drugs

An overview of recent history

Suren Basov, Mireille Jacobson & Jeffrey A. Miron

Introduction

The presumptive goal of drug prohibition is reduced consumption of illegal drugs. Standard reasoning suggests that prohibition raises the costs of supplying drugs, thereby raising prices and lowering consumption. Likewise, standard reasoning suggests that prohibition reduces the demand for drugs, either by directly affecting preferences or by raising the costs of engaging in such behaviour, further lowering consumption. Increased enforcement of prohibition, as in higher arrest rates, increased seizures, or longer jail terms, should in turn increase the effect of prohibition on supply and demand and thus the degree to which prohibition reduces consumption.

From a policy perspective, the degree to which prohibition reduces drug consumption is critical. Enforcement of prohibition costs roughly $30 billion per year, and prohibition has numerous consequences that many regard as undesirable, regardless of their views on drug consumption per se (Miron 2001). A minimal test for the cost-effectiveness of prohibition is therefore that it has a measurable effect in reducing drug consumption. Despite the importance of this issue and the simplicity of the theoretical

Suren Basov and Jeffrey Miron are at the Department of Economics, Boston University. Mireille Jacobson is at the Department of Economics, Harvard University. The authors thank Larry Katz and Claudia Goldin for helpful comments on an earlier draft.
predictions, however, existing research provides only weak empirical support that increased enforcement reduces drug consumption.¹

This paper examines the recent history of drug prohibition and illegal drug markets in an attempt to shed light on the relation between prohibition enforcement and drug consumption. In so doing, we uncover a puzzle.

Over the past 25 years in the United States, enforcement of drug prohibition has expanded dramatically. Over the same period, however, the trends in drug production and consumption have been essentially flat, and the real, purity-adjusted prices of both cocaine and heroin have more than halved. This combination of facts raises questions about the effectiveness of prohibition enforcement, and it constitutes a puzzle that is interesting to explain. In this paper we document these facts and explore possible explanations. We do not provide a complete answer, but we shed light on which explanations are likely to be most important.

The second section of this article documents the facts. We present data on drug prohibition enforcement and show that the trend has been strongly upwards over the period considered. We then document that drug production and consumption have, if anything, increased over the past twenty-five years. And we confirm, consistent with previous research, that real, purity-adjusted prices have declined substantially over the same period (e.g., Reuter 2001).

The third section discusses potential explanations for these facts. One possibility is that production costs of illegal drugs have declined relative to those of other goods. A second is that tax and regulatory costs have increased, raising the price of legal but not illicit goods. A third possibility is declining market power in the illegal drug sector, and a fourth is ‘technological progress’ in evading enforcement. We present evidence that appears to rule out declining relative production costs or increasing tax and regulatory costs as major components of the explanation. We do not provide hard evidence on the remaining two hypotheses, but we suggest these possibilities might be important.

¹ For example, Dinardo (1993) finds no evidence that enforcement raises price or reduces consumption of cocaine while Yuan and Caulkins (1999) find a generally negative time-series relation between the number of illegal drug seizures and the black market prices of cocaine and heroin. Crane, Rivolo, and Comfort (1997) document what appear to be short-term effects of enforcement on cocaine prices, but their results suggest little long-term impact. Kuziemko and Levitt (2001) provide some evidence that within-state variations in enforcement are associated with higher prices, but they do not explain the major aggregate change in prices over the period considered here.
The fourth section concludes. We emphasize that our results have no direct implications for policy. The facts fail to suggest that increased enforcement has reduced consumption of drugs or raised prices, but since we do not know what would have happened in the absence of the enforcement escalation, the impact of enforcement is undetermined. The facts nevertheless fail to indicate that enforcement reduces drug consumption and hint that enforcement itself has contributed to the decline in drug prices.

The facts

This section documents three facts: drug prohibition enforcement has increased substantially over time; drug production and consumption have, if anything, increased over the past twenty-five years; and drug prices have fallen substantially over the same period.

Enforcement of drug prohibition

There is no one correct measure of drug prohibition enforcement, since prohibition includes a broad range of activities (e.g., arrests, prosecutions, imprisonment, drug seizures, asset seizures). We focus here on measures that are available on a consistent basis over relatively long time periods. Jacobson (2001) provides data on additional measures, which confirm the conclusions discussed below. The measures of enforcement we consider are potentially endogenous with respect to the level of drug production or consumption, and this weakens our conclusion that enforcement has expanded dramatically. But the magnitudes we document seem unlikely to have resulted solely from changes in the amount of underlying production or consumption, and the fluctuations coincide with political events that suggest they result from policy decisions rather than being just policy responses.

Figure 1 presents data on the budget of the Drug Enforcement Administration (DEA) and its precursor agencies for the period 1920–2000. The DEA is the only federal government institution whose

---

1 i.e. they could potentially be directly affected by the level of drug production or consumption, whatever the intention of the authorities.

3 The sources for all the data used in this paper are contained in an appendix that is available on request from the authors.
sole mission is drug prohibition enforcement, and until the 1980s it was the main federal agency involved in prohibition enforcement to a substantial degree. During the past two decades, enforcement of drug prohibition has spread across numerous federal programs, agencies, and departments. Even during this period, however, the trends for this narrow category are similar to those for broader measures. Thus, the DEA budget provides a consistent, simple measure of the degree of enforcement.

The data show that since at least 1950 the overall trend in enforcement has been upward, but the pace of this trend has varied substantially and included a few periods of declining enforcement. Expenditure increased at a much faster rate beginning in the late 1960s and reached a local maximum in 1977; it then decreased for several years in the late 1970s before beginning another rapid increase during the 1980s. There was another decline during the early 1990s followed by still further increases in the second half of the decade. The magnitude of this expansion has been impressive. For example, between 1970 and 1998, the per capita budget of the DEA increased ten-fold.

Figure 2 presents data on arrests per capita for drug abuse violations over the period 1932–1998. The overall pattern is similar to that for DEA
expenditures, although the exact timing differs slightly. The arrest rate was relatively stable until the early to mid-1960s, when it began a substantial increase before leveling off during the mid-1970s. The arrest rate then increased dramatically during the 1980s, declined markedly in the early 1990s, and then increased again in the second half of that decade. This same pattern holds for the drug arrest rate divided by the total arrest rate; thus, the increases are not merely a reflection of general increases in arrests. Again, the magnitude of the increase is substantial; the number of drug arrests per capita rose about ten-fold between the mid-1960s and the late 1990s.

These two measures of prohibition—the only two available on a consistent basis over an extended time period—show that enforcement has increased dramatically over time. A host of other indicators, such as drug prosecutions, sentences, prisoners, and the like, show a similar picture in more detail for the past several decades (Jacobson 2001). The upward trend in enforcement has occurred at a varied pace; strong from the mid-1960s to the mid-1970s, followed by slower growth and even declines during the second half of the 1970s. Strong growth in enforcement occurred again during the 1980s, followed by slower growth and possibly a leveling
Suren Basov, Mireille Jacobsen and Jeffrey A. Miron

off in the 1990s. The net change is a dramatic increase in the degree of enforcement.

Production
We next examine data on the production, consumption, and pricing of illegal drugs over the past 25 years. These data should be interpreted with caution. As emphasized by the National Research Council (2001), data on illegal drug markets may contain significant biases and inaccuracies due to the difficulty of collecting data on illegal activities. We examine these data anyway, partially because they are the only data that exist. In addition, we focus here on long-term trends, which are less likely to be distorted by deficiencies in the data.

Figures 3 and 4 provide data on harvestable acreage after eradication of coca bush and opium poppy, respectively. Cultivation of both coca and opium increased during the 1980s and then decreased during the 1990s, with cultivation little different at the end of the sample than at the beginning, even though the level of enforcement was much higher. In addition, cultivation increased during the 1980s, when enforcement increased most dramatically. This does not mean enforcement had no effect; anecdotal
evidence suggests that coca eradication caused a shift in production from Peru and Bolivia, the major producers in the 1970s and 1980s, to Brazil and Colombia (UNDCP 2000a). The recent involvement of Colombia in poppy cultivation and heroin production may reflect a similar impact of eradication efforts in Asia. But any permanent effect on the total amount of cultivation is not apparent.

Figures 5 and 6 show, moreover, that while cultivation is not much different now than two decades ago, productive efficiencies have increased. The figures provide data on potential production of coca leaf and opium, respectively. Potential coca production increased from about 90,000 metric tons in 1983 to about 613,400 metric tons in 1999. Similarly, potential opium production among countries exporting to the US increased from about 80 metric tons in 1987 to 150 in 1999. As with cultivation, there were substantial changes in the location of production that accompanied the overall trends. Peru was the more important producer of coca leaf through much of the sample period, while Colombia was the leader in refining leaf.

---

4 The UNDCP arrives at these estimates by combining estimates of acreage under cultivation net of eradication with estimates of crop yield. The data come from source country governments, UNDCP field offices, and the US Bureau for International Narcotics and Law Enforcement Affairs (UNDCP 2000a).
Figure 5: Potential cocoa leaf production: 1986–1999

Figure 6: Potential opium production: 1987–1999
(or cocaine paste, an intermediate product) into cocaine. During the 1990s, however, leaf production increased substantially in Colombia while falling in Peru. Opium production in Colombia increased dramatically, from virtually nothing to about 75 metric tons in 1999.\(^5\)

To summarize, there is no evidence that production of illegal drugs is lower than it was twenty-five years ago, even though enforcement has increased dramatically. This does not mean enforcement has had no effect; we do not know what would have happened in the absence of the increase in enforcement. In addition, there may have been short-term reductions in supply on the heels of major enforcement initiatives, and there have certainly been shifts in the location of production that seem to reflect enforcement efforts. But over the horizon of decades, the expected negative relationship between enforcement and total production is not apparent.

**Consumption**

The fact that cocaine and opium production have, if anything, increased over the past 25 years does not by itself mean consumption has increased, since increased enforcement has potentially stopped a larger share of drugs from reaching consumers.\(^6\) We therefore examine consumption indicators directly.

Figure 7 presents data from the National Household Survey on Drug Abuse (NHSDA) on the fraction of the non-institutionalized population aged 12 and over that has used cocaine or heroin in the past year.\(^7\) Despite the recent rise in heroin use, these data suggest there have been significant decreases in both cocaine and heroin use over the past two decades. Figure 8 reports data from Monitoring the Future (MTF) on the percentage of high-school seniors reporting cocaine or heroin use in the past year.\(^8\)

---

\(^5\) Moreover, neighbouring countries such as Peru and Venezuela have reported small-scale opium production. For the 1987–1999 period, UNDCP (2000a,b) data also provides estimates of cocaine and heroin production. These indicate substantial increases over that period.

\(^6\) Existing data show that seizures have increased substantially over this period. These increases may account for over half the increase in cocaine production and a third of the increase in heroin production over the past decade, a period for which production estimates are most readily available (UNDCP 2000a).

\(^7\) Although the first survey was completed in 1970, the earliest publicly available data are for 1979. Data are also available for 1982, 1985, 1988 and 1990–1999.

\(^8\) A different source of drug use data, the Arrestee Drug Abuse Monitoring Program (ADAM, formerly known as the Drug Use Forecasting Program, or DUF), reports on interviews and drug tests for arrestees in major cities. Analysing long-run trends with ADAM/DUF is difficult because data collection only began in 1987 and the set of cities sampled has changed substantially over time.
Suren Basov, Mireille Jacobsen and Jeffrey A. Miron

Figure 7: Past year cocaine and heroin use among population 12 and older: 1979–1998

Figure 8: Past year cocaine and heroin use among high school seniors, MTF: 1975–1999
These data show a decline in heroin consumption in the late 1970s and cocaine consumption in the late 1980s followed by a considerable rebound in both in the 1990s. Overall, neither cocaine nor heroin use is substantially lower than 25 years ago.

Taken together, these measures of drug use provide only modest evidence that cocaine or heroin use has declined during the period of increasing enforcement. In addition, data on heavy use as opposed to any use provide even less indication of a decline in consumption.

Figure 9 shows NHSDA data on the percentage of persons who admit using cocaine on 51 or more days in the past year or heroin monthly in the past year. Heavy cocaine use has dropped approximately 25% since 1985; this is a much smaller percentage decline than for any use (60%). Heavy heroin use shows little trend over the entire sample. Figure 10 contains the MTF data on use 40 or more days in the past year. Heavy heroin use has remained fairly stable. Chronic cocaine use peaked in the mid-1980s, fell until 1993 and then rose slightly thereafter; the rate is little different at the end of the sample than at the beginning.

---

9 1985 is the first year NHSDA asked about chronic consumption.
The difference in results for heavy use versus any use might mean that casual use has declined while heavy use has not. It might also mean that casual users have become relatively more reluctant to admit drug use over this period, perhaps because of increased enforcement. Nonetheless, the heavy use figures are telling since existing estimates suggest that heavy cocaine users account for about three-quarters and heavy heroin users an even higher fraction of the amount of these substances consumed (ONDCP 2000).

Three other indicators of heavy drug use suggest substantial increases over the last two decades. Figure 11 presents data from the Drug Abuse Warning Network (DAWN) on drug mentions during emergency room episodes in major cities; Figure 12 presents data from Vital Statistics on drug-induced deaths; and Figure 13 provides data on drug treatment clients (all per 100,000 of the population). All three show substantial upward trends, which suggests increases in heavy or problematic drug use.

10 Drug-induced deaths include deaths from drug psychoses, drug dependence (excluding alcohol and tobacco), suicide by drugs, and assault from poisoning; it excludes accidents, homicides and other deaths indirectly related to drug use.
Prohibition and Illegal Drugs

Figure 11: Rates of emergency room cocaine or heroin mentions: 1978–1998

Figure 12: Drug-induced deaths: 1979–1998
There are many possible explanations for the upward trends in Figures 11–13 other than true increases in heavy drug use. Increased funding probably contributed to the increase in drug treatment clients. Increased purity might have produced a greater number of drug deaths for a given level of drug consumption. Better detection methods or increased willingness to report drug use in connection with deaths or ER mentions might affect these trends. Nevertheless, they all suggest substantial increases rather than decreases.

The indicators of consumption we consider are potentially biased in ways that correlate with enforcement. Increased enforcement, for example, might encourage underreporting of self-reported drug use. Alternatively, increased enforcement might cause additional DAWN mentions or increased attribution of deaths as death overdoses, if those in charge feel compunction to uphold the law. And it might discourage such reporting if those in charge wish to spare patients and families the stigma attached. Thus, the net effect of enforcement on the reporting of these indicators is not clear.

An additional possibility is that enforcement raises the true occurrence of some of these measures. If increased intervention in drug markets increases
the variance in quality, then the incidence of accidental overdoses might increase for a given level of drug consumption. These caveats aside, the overall collection of indicators suggests that illicit drug consumption has changed little over the past 25 years and may even have increased.

The prices of cocaine and heroin

Although the ultimate objective of prohibition is presumably reduced consumption, analyses of prohibition frequently focus on prices. This is partially because available data on production and consumption are problematic. In addition, data on illicit drug prices are readily available. These data have their own deficiencies (Horowitz 2000), but they exist at a level of detail that is attractive for many kinds of analysis. And one effect of prohibition enforcement—increased supply costs—ought to operate on drug consumption in a predictable way via prices, given the elasticity of demand.

The price data we examine are from the DEA’s System to Retrieve Information from Drug Evidence (STRIDE). This dataset records purchases and seizures of illegal drugs made by undercover DEA agents and informants as well as by the Metropolitan Police of the District of Columbia. A typical observation in STRIDE reports the type of drug acquired, the weight and purity of the drug, the city where it was acquired, the date the ‘transaction’ occurred, and, if the drug was purchased, the price paid. The data are available for the period 1974–2000.

Figure 14 shows median prices in 1999 dollars per pure gram (PPG) of cocaine and heroin. We examine median rather than mean prices because of the high variability of STRIDE data over time and across cities. We consider the real price per pure gram to account for changes in the purity of cocaine and heroin over time.

---

11 See, for example, Caulkins and Reuter (1998) or Kuziemko and Levitt (2001).
12 STRIDE data were first recorded in 1970 but there are few observations before 1974.
13 We are not able to generate comparable price series for marijuana. The STRIDE data concentrate on cocaine and heroin, so marijuana observations are a small fraction of the cocaine or heroin purchases (roughly 6,500 compared to 90,000 for cocaine and 50,000 for heroin over the period 1974–2000). Moreover, fewer than 1/10 of the marijuana observations include purity estimates. Pacula et al. (2000) use secondary DEA sources to generate marijuana price series for the period 1981–1998. Unfortunately, the secondary sources they use are derived from STRIDE. Their source material gives little information on the estimation of the quarterly price and annual purity data. Conversations with a DEA statistician, however, confirm that they are based primarily on STRIDE. Since anecdotal evidence suggests there have been significant increases in purity over the past 25 years (Harrison et al. 1996), it is likely that prices unadjusted for purity give a misleading picture.
14 The use of regression techniques to adjust prices for purity and transaction size leads to similar results (Jacobson 2001, Chapter 4). Caulkins (1994) discusses these issues in more detail.
The real purity-adjusted prices of cocaine and heroin have dropped markedly since the mid or late 1970s. Cocaine has fallen from roughly $700 dollars per pure gram in the late 1970s to about $60 during the 1990s. Heroin has fallen from almost $6000 per pure gram at its peak in the late 1970s to roughly $300 in recent years. Examination of price in various size classes (e.g., purchases of 10 grams or less) reveals strikingly similar patterns.

The data we have presented so far are for monetary prices, rather than ‘full’ prices that account for availability. Figure 15 presents data from MTF on the percent of high school seniors saying it is “very easy” or “fairly easy” to obtain cocaine or heroin. Interestingly, the perceived ease of obtaining either cocaine or heroin fell in the late 1970s, at the outset of a period of relative easing of drug law enforcement. Perceived availability of cocaine shot up in the late 1970s and again in the mid to late 1980s, after a dip between 1980–1983. The perceived availability of cocaine declined after the targeted campaign against crack markets and use in the late 1980s but has remained at much higher levels than in the 1970s. Although perceived availability of heroin also fell in the mid-1970s, it has increased fairly consistently since 1978. Thus, it does not appear that the lower monetary prices have been offset by diminished availability.
Prohibition and Illegal Drugs

Summary

The data examined above demonstrate that over the past 25 years in the United States, enforcement of drug prohibition has increased substantially, while production and consumption of drugs have likely increased, and prices have fallen dramatically.

Reconciling the facts

In this section we present an initial attempt to reconcile the facts presented above. We do not succeed fully. But the evidence we present helps rule out some hypotheses and provides anecdotal evidence in favor of others.

Framework

Figure 16 presents supply and demand curves for drugs. The top panel portrays the standard view of how increased enforcement should affect the market for drugs. Increased enforcement raises supply costs, causing supply to shift from $S_0$ to $S_1$; and increased enforcement raises the non-monetary costs of using drugs, causing demand to shift from $D_0$ to $D_1$.
Thus, the natural assumption is that consumption decreased in response to the escalation in enforcement. The effect of increased enforcement on price is ambiguous, but auxiliary evidence suggests that enforcement’s impact on demand is small, even at current levels (Miron 2001). Thus, the presumption is that prices should have risen in response to increased enforcement, perhaps substantially.

Given that consumption has stayed constant or increased while price has declined, there must have been a downward shift in supply that more than outweighed any upward shift caused by increasing enforcement and that roughly offset the effect of decreased demand on consumption. If one interprets the evidence above as suggesting that consumption has increased, then this downward shift of supply is sufficient to explain the facts. Likewise, if one assumes a relatively inelastic demand curve, and relatively unchanged consumption, then the downward shift in supply is sufficient. If one assumes a relatively elastic demand curve and/or relatively unchanged consumption, then there must also have been an inward shift in demand to fit the facts. This might have occurred because of increased enforcement aimed at users.

Under any interpretation, the critical fact is that on net supply has shifted out rather than in. The question is why this might have occurred.

**Declining relative production costs**

One possible reason for an outward shift in the supply of drugs is a decline in the production, transportation, and distribution costs of drugs relative to those of other goods. We examine this hypothesis by considering the prices of ‘similar’ goods.

Consider first the legal versions of cocaine and heroin. Cocaine is a Schedule II drug under the Controlled Substances Act of 1970, which means it can be legally used for a limited number of medical purposes.
Heroin is a Schedule I drug, which means it cannot be so used, but closely related products, also derived from opium, are in Schedule II or higher (e.g., morphine, codeine).

Figure 17 presents data on the real prices of pharmaceutical cocaine and morphine. The price of 8 mg/ml morphine tablets fell from roughly $60 in 1978 to $38 in 1981 but then rose to more than $75 in the late 1980s before declining slightly over the subsequent decade. The price of 10mg/ml morphine tablets follows essentially the same pattern. In contrast, the trend in prices of 15 mg/ml morphine tablets is quite different, with the real price roughly doubling over the sample. The price of cocaine declines slightly during the 1980s before jumping up markedly in the early 1990s and then remains relatively flat over the remainder of the sample; the price of cocaine is 2–3 times higher at the end of the sample than at the beginning.

These data therefore fail to suggest that declining relative manufacturing costs can explain the declining black market prices of cocaine or heroin. These data do not address the possibility of technological progress in distribution or retailing, however.
To examine this possibility, we consider the time-series behavior of products with similar distribution and retailing patterns. Figure 18 presents the real price of coffee, of food, and of alcoholic beverages at the retail level. The real price of coffee declines from 1980 through about 1994 but then rebounds and is little different in the last half of the 1990s than in the late 1970s. The real price of retail food and alcoholic beverages are little different over the sample. This suggests technological progress in distribution and retailing has not been sufficiently great to explain a dramatic decline in the relative price of these goods and thus fails to suggest that declining distribution or retailing costs can explain the decline in the relative price of drugs.

Thus, we find no evidence that declining relative production costs can explain the outward shift in the supply of drugs.

The data are the CPI for coffee purchased for home consumption; that is, it mainly reflects purchases at grocery stores of ground coffee or beans, not purchases at Starbucks or Dunkin’ Donuts.
Changes in tax and regulatory costs

A different possible explanation for the declining relative price of black market cocaine and heroin is that the tax and regulatory burden on legal goods has increased. Since black market suppliers typically evade the costs created by policies, any cost increases for legal goods would translate into decreased relative prices for illicit goods. The level of such costs implies a substantial price advantage, other things equal, for black markets goods (Miron 2001), but the evidence does not suggest substantial changes in these costs over the relevant period.

The most obvious cost evaded by illicit drug suppliers is taxes and associated compliance costs. Between 1970 and 1995, however, tax and social insurance receipts remained fairly stable as a percent of GDP, though the composition did change. Taxes (federal + state and local) fell from about 23% to 20% of GDP over this period while social insurance (again federal + state and local) increased from about 5.5% to 8.9 over this same period.

Similarly, the budgets of the key regulatory agencies (EPA, OSHA) have not grown relative to GDP over the relevant period, which makes it unlikely that their regulations could have imposed substantially greater costs. There is some evidence that such regulation has reduced productivity growth in affected industries, but even high-side estimates of such effects can explain only a small fraction of the relative price drop for illicit drugs (Miron 2001).

Market power

A third possible reason for an outward shift in the supply of drugs is decreased market power in the illicit drug sector. There is anecdotal evidence that illicit drug markets have been characterised by market power in the past (e.g., the Medellin and Cali cocaine cartels in Colombia), and theoretical reasons why illicit markets might be less competitive than legal markets (Miron and Zweibel 1995). If the degree of market power has fallen over time, this would explain some of the declining relative price of illegal drugs.

We are not aware of data that permit direct examination of this hypothesis, but there is informal evidence that is suggestive. For example, the National Narcotics Intelligence Consumers Committee (NNICCC) (1984, p.27) writes that
Suren Basov, Mireille Jacobsen and Jeffrey A. Miron

…the most significant factor impacting on the international cocaine traffic during 1984 was the expansion of all phases of the traffic including cultivation, processing and distribution. Not only was illicit coca cultivation expanding in the source countries of Peru, Bolivia and Colombia, but it was spreading into other countries, such as Ecuador and Brazil. As illicit coca cultivation increased, cocaine refineries and transshipment centers continued to emerge throughout the hemisphere.

The quote does not necessarily imply that market power declined, but the expansion of both coca leaf production and cocaine refining into a number of additional countries seems likely to have been accompanied by increased competition.

A similar phenomenon has occurred for heroin. The most notable shift has been the increasing role of Colombians in both the cultivation of opium poppy and the production of heroin bound for the United States. Before the 1990s, Colombians cultivated virtually no opium poppy. By the late 1990s, however, 65% of the heroin seized in the United States was from Colombia (UNDCP 2000b).

**Technological progress in evasion**

A final explanation for a decline in the costs of supplying drugs is technological progress in evading prohibition. Production of a black market good can be thought of as the production of two goods, the commodity itself and ‘evasion’, meaning all the activities undertaken to avoid the sanctions associated with violating prohibition. Enforcement raises these evasion costs, implying higher prices, but there can also be technological progress in producing evasion, which offsets increased enforcement to some degree, lowering the price of illicit goods relative to legal goods. Reinforcing this effect, black market suppliers have a greater incentive to innovate than legal market suppliers because they keep all of the return rather than only the after-tax amount.

There are numerous examples of such innovation in evasion. Suppliers discover additional routes or new means of transporting drugs and randomise which they use, thereby making detection more difficult. Suppliers learn which kinds of law enforcement officers are most corrupt. And suppliers develop new retail methods that make standard enforcement

---

16 In contrast to Afghanistan and Myanmar, Colombia is a relatively small producer of opium poppy and heroin but it is, nonetheless, a big supplier to the United States. Mexico is also a large producer of heroin bound for the United States but has played this role for decades.
techniques less effective. For example, they provide customers with beeper or cell phone numbers and make deliveries, rather than dealing on street corners where there is a greater risk of arrest.

**Discussion**

This paper documents that over the past 25 years in the United States, enforcement of prohibition has increased substantially while drug prices have fallen and drug consumption has, if anything, increased. These facts do not by themselves show that drug prohibition fails to raise prices and reduce consumption, since they do not show what would have occurred had enforcement not escalated. These facts are, however, mutually consistent only if there has been a substantial net increase in the supply of illicit drugs, a phenomenon that flies in the face of the very goals of drug prohibition.

The two most likely explanations for such a shift in supply are decreased market power and innovations in evading enforcement. Why might market power have declined or evasion increased? Moreover, does the timing of these changes have any connection to the escalation of enforcement?

Indeed, the observed correlation between increases in enforcement and declining market power or improved evasion may be merely coincidence. In particular, enforcement might have reached a point of low marginal returns by, say, 1975. Further increases may have thus had little effect while a gradual decline in market power occurred in combination with improved methods of evasion.

Anecdotal evidence, however, suggest a more provocative hypothesis: increased enforcement may have contributed to both the decline in market power and the innovations in evasion. In fact, the DEA itself admits that law enforcement efforts in Colombia have led to expansion of coca cultivation to areas beyond the nearby Andes (NNICC 1984 Report, p. 27), most recently in Brazil, and encouraged other countries to produce their own cocaine HCL (e.g. Peru and Bolivia) and set up their own, independent trafficking networks (e.g. Mexico) (NNICC 1998 Report, p. 4).

Similarly, Zeese (2000) suggests that many innovations in supplying drugs have been caused by enforcement. For example, he suggests that marijuana interdiction during the early 1980s prompted suppliers to switch
Suren Basov, Mireille Jacobsen and Jeffrey A. Miron
to cocaine, which is less bulky. Likewise, he suggests that suppliers have
tested to land blockades by developing sea and air routes; that Asian
traffickers took advantage of efforts to plug the Mexican border during the
Nixon administration; and that the spraying of Mexican marijuana led
Americans to plant their own seeds and develop domestic supply.

Determining exactly why drug consumption and prices have not
responded in the expected fashion to the dramatic increase in enforce-
ment over the past two and a half decades in the United States is a daunt-
ing task. Accurate data on illicit drug markets are difficult to obtain, and
credible identifying assumptions are scarce. Nonetheless, progress in
understanding these markets is critical to an informed analysis of drug
policy.

References

Caulkins, Jonathan P. (1994) Developing price series for cocaine. Santa Monica, CA: Rand
Corporation.


of Counterdrug Interdiction Program Effectiveness”, IDA Paper P-3219, Alexandria,
VA: Institute for Defense Analyses.

DiNardo, John (1993) “Law Enforcement, the Price of Cocaine, and Cocaine Use”,
Mathematical and Computer Modelling, 17(2), 53–64.

Harrison, Lana D., Michael Backenheimer, and James A. Inciardi (1996) “Cannabis
Use in the United States”, Cannabis in Germany, France, and the United States, Peter
Cohen and Arjan Sas (eds.) Amsterdam: University of Amsterdam Press.

Jacobson, Mireille (2001), XXX

Kuziemko, Ilyana and Steven D. Levitt (2001), “An Empirical Analysis of
Imprisoning Drug Offenders”, manuscript, University of Chicago.

for Cocaine”, manuscript, Boston University.

Prohibition and Illegal Drugs


