THE BECKLEY FOUNDATION
DRUG POLICY PROGRAMME

Understanding Drug Markets And How To Influence Them

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REPORT FOURTEEN

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The Beckley Foundation Drug Policy Programme (BFDPP) is an initiative dedicated to providing a rigorous, independent review of the effectiveness of national and international drug policies. The aim of this programme of research and analysis is to assemble and disseminate material that supports the rational consideration of complex drug policy issues, and leads to a more effective management of the widespread use of psychoactive substances in the future. The BFDPP currently chairs the International Drug Policy Consortium (www.idpc.info), a global network of NGOs and professional networks who work together to promote objective debate around national and international drug policies, and provide advice and support to governments in the search for effective policies and programmes.

Introduction

This paper provides a review for policy makers of what is known about the economic structure of illicit drug markets and the business operations of high level dealers operating within it. It is based on interviews with imprisoned drug traffickers and dealers in UK prisons carried out by Matrix Knowledge Group, and also owes a substantial debt to the valuable work done in this field by Peter Reuter, Jonathan Caulkins and Frederick Desroches, amongst others. The paper does not review the harms caused by law enforcement, some of which have been looked at in previous reports. It assumes that the structure of drug markets influences the primary harms arising from drug use (e.g. excess mortality and disease), the violence that is related to drug markets and the opportunity costs of people spending time and money on illicit substances. Some of these harms might be reduced by introducing alternative arrangements for the international regulation of psychoactive substances. These alternative arrangements are not reviewed here. Rather, the aim is to provide policy makers with information on drug markets as a basis for focussing enforcement resources, and devising more effective policies, to reduce the damage done by the trade in illicit drugs.

What do we know about illegal drug markets?

Market size

Estimating the size of the illegal drug market presents significant challenges. When business comparable calculations have been attempted for the illegal drugs trade, the market size estimates are \$20 - \$25 billion (for cocaine, heroin, cannabis and synthetic drugs), or roughly equivalent to the global trade in coffee or tea (Reuter & Greenfield, 2001).

Prices are high

Market size estimates are based on price data, and although the overall value of their trade may be roughly equivalent, heroin and cocaine are substantially more expensive than coffee or tea. The illegal status of heroin and cocaine means fewer 'deals' are done than is the case in the coffee market, but the subsequent enforcement of their illegal status also has the effect of raising the price far higher than that found in legitimate commodity markets. It has been estimated that the retail price of heroin is 30 times higher per unit weight than gold (Reuter & Greenfield, 2001). Prices are high because heroin and cocaine are scarce, but not in the sense that diamonds are. They can easily be cultivated in many different regions of the world. They are scarce because they are legally prohibited.

But scarcity alone is not sufficient to generate high prices. High demand is also necessary. Where suppliers are relatively scarcer than buyers, suppliers have the upper hand in negotiations over price. This upper hand is more formally termed 'bargaining power' and in the trade in heroin and cocaine it is likely that suppliers have bargaining power over buyers at all market levels.

As with all products, the price of illegal drugs increases the closer it gets to the end consumer. The path that a product takes from being produced to being 'consumed' is called the supply chain. At the global level our understanding of the heroin and cocaine supply chains is reasonable. Satellite technology provides us with estimates of the amount of land cultivated for opium and coca (UNODC, 2007). We have much less understanding about the individual transactions that comprise this global picture and the transactions that take place within consuming countries. Some researchers have noted that the number of links in the chain between importation and retail level distribution can be surprisingly short and the market is therefore best understood as a flat or shallow pyramid (Pearson & Hobbs, 2001). At other times there can be large numbers of links as suppliers are not usually observed to divide their drugs into quantities smaller than a tenth of what they purchased. For a 10 kilogram purchase of heroin this could mean transactions take place between five dealers before the drug reaches the end user.

How prices, profits and business costs alter at successive market levels is a significant gap in our understanding of illegal drugs markets. Recent research has used data obtained from interviews with traffickers to construct supply chains for heroin and cocaine in the UK including price and 'mark-up' (the percentage difference between the selling and buying price) figures, but these data are rare. Figure 1 illustrates that the overall mark-ups for heroin and cocaine between the farm gate and the consumer are about 16,800 per cent and 15,800 per cent respectively. These can be compared with the mark-up for coffee between the farm gate and sale in retail markets in the consuming country, of 413 per cent (Fritter & Kaplinsky, 2001 & International Coffee Organisation[1]).

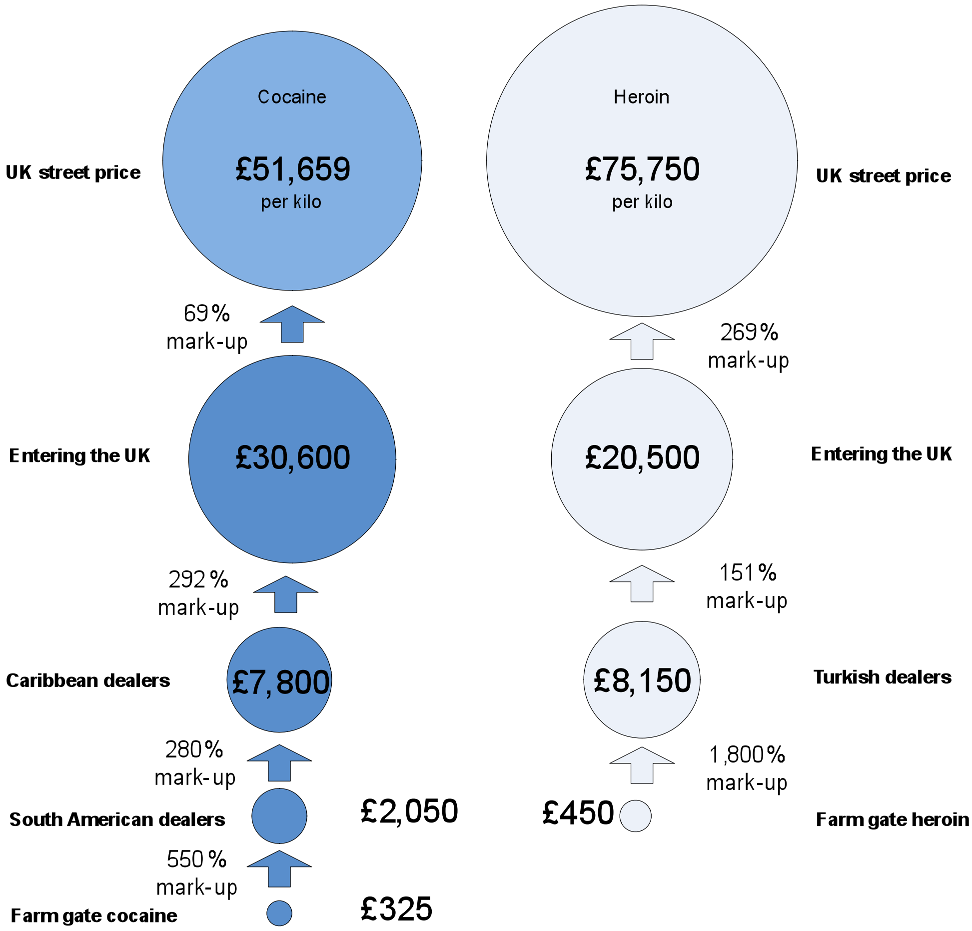


Figure 1 Supply chains and subsequent mark-ups for cocaine and heroin in the UK [based on data from Reuter and Greenfield, 2001 and Matrix Knowledge Group, 2007]

Figure 1 shows that the mark-ups associated with dealing heroin and cocaine are greatest at different points in the supply chain. Higher mark-ups imply greater costs or risks to the dealer. The mark-ups associated with importing cocaine into the UK are greater than those associated with importing heroin, while the mark-ups associated with selling heroin at street level are greater than for dealing cocaine. (Marsh, forthcoming). In comparison with coffee, the mark-ups in the consuming country are similar.

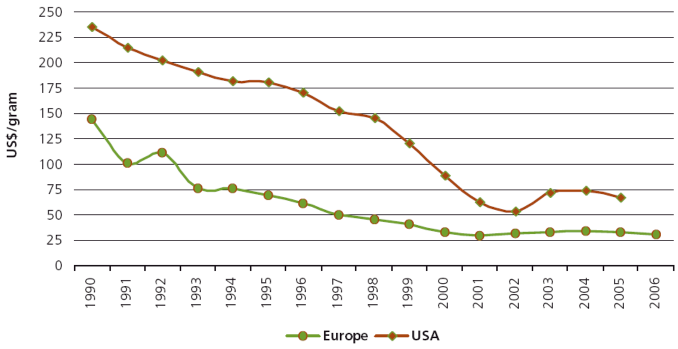
Prices vary by time and geographic location

Beyond the fact that prices for heroin and cocaine are high, the next most apparent fact is that price varies. Economics suggests that prices vary because of changes in the relationship between supply and demand. Unpicking the extent to which variation is due to supply or demand side factors poses challenges in an illegal market where we have limited knowledge.

The available data do suggest that price (adjusted for purity) has reduced over time. Figure 2 illustrates reductions over the past 16 years in the wholesale price of heroin and cocaine in Europe and the US. It shows that between 1990 and 2005 the wholesale price of heroin fell 77 per cent in Europe and 71 per cent in the US. For cocaine, the wholesale price fell 53 per cent in Europe and 70 per cent in the US (World Drug Report, 2007).This is troubling because the weight of evidence suggests that price declines lead to increased use. Although difficult to calculate, the price elasticities, or the percentage change in demand for a one percent increase in price, for cocaine and heroin have been estimated. Estimates of the price elasticity of cocaine range from –0.7 to –2.0 while the figures for heroin are smaller, from –0.2 to –0.3 implying that heroin users are less sensitive to price changes. Cigarettes have been calculated as having a price elasticity of –0.4 (MacCoun & Reuter, 2001). However, these estimates are part of an on-going debate. A paper by Skott and Jepsen (2002) suggests that demand for heroin is inelastic, but this contrasts with Caulkins' suggestion of relative elasticity .

There are no conclusive answers why the price of heroin and cocaine has fallen so sharply, (whilst remaining far higher than legal commodities) at a time of increasing law enforcement efforts,

1 The farm gate price was defined as the price received by the farmer before any subsequent processing. For coffee the price used was the average price paid to Colombian growers of Arabica coffee in 1994, as provided by the International Coffee Organisation www.ico.org/asp/select7.asp



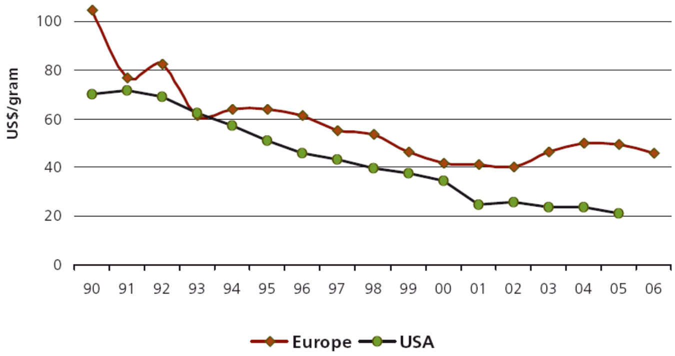


Figure 2 Wholesale heroin (left hand side) and wholesale cocaine (right hand side) prices in Europe and the USA, 1990-2006 (US$/gram) [World Drug Report, 2007]

especially as the price reductions have occurred against contrasting trends in demand; use of cocaine has been falling in the USA but increasing in the European Union (US Department for Health and Human Services and EMCDDA, 2007). However, factors other than drug seizures, arrests of key market players and changes in demand can influence price.

Dealers may have become more efficient over time, finding ways to reduce the financial and non-financial costs associated with drug dealing. It has been argued that dealers are taking advantage of the ever globalising economy where they can seek out cheaper distribution channels and are able to find more individuals from developing countries willing to act as drug couriers for less money (Storti & De Grauwe, 2007). Globalisation may also lead to increased competition, by identifying more individuals willing to be drug dealers and incur the risks that this entails for less financial reward. Increasing efficiency and competition could override the effect of increasing law enforcement and changes in demand to push prices down. However it is worth noting that these effects are not independent of law enforcement activity. By increasing the perception of how 'risky' it is to be a drug dealer, law enforcement indirectly influences the efficiency gains that drug dealers can make and the extent of competition they face. Alternatively, it may be that drug dealers do not respond to risk the way that we may expect if they acted rationally. Inefficient business decisions in the form of irrational pricing strategies by drug dealers may have contributed to price reductions (Caulkins & MacCoun, 2003).

Unlike legitimate commodity markets where price variation is small in comparison, the price of heroin and cocaine has been shown to vary substantially between and within cities in the same country (Reuter & Caulkins, 2004). This is another indirect effect of law enforcement. In legitimate markets information on prices in different cities is readily available though advertising and the internet. This has led commentators to suggest that drug markets operate at local and regional rather than national levels (Caulkins & Reuter 1998).

Research has indicated that some dealers are able to learn about different market conditions through exploiting networking opportunities and existing contacts, though not in any systematic fashion, as illustrated by the quotes from interviewed drug dealers below. Dealers who are able to obtain these insights have advantages over their competitors: they may choose to undercut their competitors or, if a local market is quiet, charge higher prices, as two kilogram level heroin dealers in the UK describe.

"If you want to see what the market is like, go look at the street corners where heroin is sold. If each street corner has a dealer on it, then you know there is enough heroin about. If there aren't any dealers about then you know there is a shortage and you can push the price of the kilos up."

"It is a small network of all the same people that work across the higher levels of the heroin market in the England and you can ask a couple of people how the market is, who will ask a couple more, and then they will ask a couple more and eventually you will receive a good picture of how the market is looking and what price you can charge." (Matrix Knowledge Group, 2007)

What is a drug dealing enterprise?

The majority of research on drug dealing has focused on retail dealers selling directly to users, presumably because these individuals are easier to engage in research projects. The evidence suggests that dealers at this level make little if any profit from their activities and are frequently dealing to sustain their own drug use, rather than to make money. In order to understand how individuals are able to generate high profits, it is necessary to explore the higher market levels. Desroches has recently completed a comprehensive review of the research on upper level trafficking, based in part on his large scale study of Canadian drug traffickers (Desroches, 2007 and Desroches, 2005). The Matrix study in the UK was largely consistent with Desroches' findings. This paper complements this review by briefly exploring the motivations of those involved and the business structures that they operate within.

How and why do individuals get involved?

Even at the basic level of understanding how individuals come to be high level drug dealers relatively little is known. A key finding of recent research by Matrix Knowledge Group was that a large proportion of individuals entered drug dealing through friends or family members (Matrix Knowledge Group, 2007). Within the sample of 222 interviewees sentenced to more than seven years for drug related offences, three quarters entered the market in this way, compared with nine per cent who became involved through their own drug use. This implies that drug dealing spreads 'contagiously'. The epidemiological nature of the spread of drug using has been documented and informed policy for many years (Hunt, 1974), but the equivalent conclusion regarding drug dealing is a novel finding. Given this evidence that individuals entered high level drug dealing primarily through existing contacts in the business, it seems sensible to conclude that without these contacts opportunities for entering the market are curtailed. High level dealers emphasise the need to be able to trust those they worked with. Individual dealers working together are often people who have known each other for many years (Desroches, 2005 and Matrix Knowledge Group 2007). However, for those individuals 'invited' into drug dealing organisations the barriers to entry are thought to be minimal (Reuter & Haaga, 1989 and Matrix Knowledge Group, 2007). It does not appear that any particular skills are required beyond 'business sense' and a willingness to break the law. The availability of credit meant that access to capital was rarely cited as a barrier.

Although those involved in drug dealing have in common their access to contacts, the individuals involved are diverse which makes constructing typologies difficult. Based on an extensive interview programme with high level drug traffickers in Canada, Desroches described two types of individuals involved in the trade; 'criminal' drug traffickers with extensive criminal involvements and 'businessmen' drug traffickers who, other than their involvement in drug dealing, are relatively law-abiding (Desroches, 2005). The majority of these individuals were able to earn a comfortable living through legitimate means and had strong social relationships.

Other research has explored the reasons for entry into high level drug dealing. Dorn, Levi and King (2005)), identify 'political objectives', 'personal enrichment', and 'risk toleration' as key motivational factors, and constructed a classification system on this basis, while pointing out that any attempt to impose a structure on high level drug dealers masks extensive variation. Any classification system of high level drug dealers should be regarded as the extremes of a continuum, rather than set categories. In Dorn, Levi and King's typology of drug traffickers 'politico-military traffickers' use drug dealing as a means to achieve political change or power, 'business criminals' are involved in drug dealing to make money for themselves and 'adventurers' accept but do not fully understand the risks they take because they enjoy the excitement or because they feel they have little alternative.

How are drug dealing enterprises structured?

Over time our understanding of organised crime has moved from the model of large scale criminal syndicates such as the mafia or drug cartels to include fluid organisations that connect small groups of independent entrepreneurs able to trust one another through kinship or friendship ties (Pearson & Hobbs, 2001; Desroches, 2005). Ethnicity is also important in that certain sectors of the drug market in Western Europe appear to be dominated by specific immigrant groups (Paoli & Reuter, 2008). Whilst this does not appear to be the case for cannabis or synthetic drugs, high level trafficking of heroin is frequently associated with Turkish and Albanian groups, while importation of cocaine is often linked to Colombians. Reasons for this could include low socioeconomic status and cultural marginalization among immigrant communities, large immigrations into consuming countries, which enable the extremely small criminal element to disguise their operations, strong family ties, geographical proximity to production or to trafficking routes, and lax enforcement in home countries.

Common sense suggests that drug dealing enterprises are likely to be smaller than legitimate businesses because of the need to stay hidden from law enforcement agencies. However, as in legitimate business environments, there are advantages to being bigger. Drug dealing enterprises that while remaining small are larger than their competitors potentially have higher productivity and earnings and are not necessarily at greater risk of arrest (Bouchard, 2006).

Drug dealing enterprises vary in their degree of permanence. Successful enterprises do not necessarily endure over time but have more flexible structures (Reuter & Haaga, 1989). In their approach to classifying high level drug dealers Dorn, Levi and King (2005) described wide diversity in organisational structures whilst emphasising that there can be no set definitions. Their 'politico-military traffickers' comprise strongly defended hierarchies operating openly with high levels of permanence of the orders of decades. 'Business criminals' comprise a core group held in place by close relationships between the main individuals but with the flexibility to involve others when needed. These groups may last for several years, Groups of 'adventurers' include individuals and friends 'drifting' between deals and have low permanence levels (weeks or months).

Where enterprises have a stronger degree of permanence and involve a number of different individuals it is important to understand the roles that different individuals undertake in operations. Individuals involved in high level drug dealing can often have very different roles. For example, research has illustrated that individuals acting as middle market drug 'brokers' link in complex ways to wholesale suppliers and retail customers (Pearson & Hobbs, 2001). In contrast some individuals are employed to undertake specific roles. Matrix Knowledge Group attempted to define the diverse roles undertaken by individuals involved in the business in their research (Matrix Knowledge Group, 2007). The definitions identified in this research are illustrated in Box 1.

Box 1 Definitions of roles involved in drug dealing and trafficking operations

Roles defined by position in the supply chain

- International Wholesaler: Buys drugs outside of the UK, arranges transportation and sells them within the UK
- National Wholesaler: Buys and sells drugs in bulk across the UK
- Local Wholesaler: Buys and sells within one geographical area (e.g. a city or small region)
- Retailer: Sells drugs at the street level to users

Roles defined by business structures

- Boss: Someone in charge of operations who pays people's salaries
- Manager: Someone who manages activities but was not the boss of the operations (e.g. oversees recruitment and training of mules)
- Partner: Someone who worked as part of the operations taking an equal share with others in the sale of the drug

Roles defined by support activities

- International transporter: Involved in the transportation of drugs into the UK (e.g. mule or haulier) and not involved in the buying or selling of drugs
- Tester: Someone who tests the quality of the drug
- Legitimate professional: Accountant, solicitor, estate agent etc who facilitates drug trafficking operation
- Money collector: Involved in the collection of debts accrued through the sale of drugs
- Transporter/runner: Transports drugs between locations and actors (e.g. supplier to buyer or supplier to storer)
- Specialist: Someone with a particular skill (e.g. pill maker)
- Mixer: Someone involved in the cutting and cleaning of drugs between purchase and sale
- Storer: Someone who holds drugs between purchase and sale
- Law enforcement official: A law enforcement worker who facilitates drug trafficking operations

Despite large diversity in business operations, enterprises can also be classified by the sophistication of the 'technologies' used to transport drugs (Caulkins, Burnett and Leslie, forthcoming). The Matrix data are being used to develop typologies of importing enterprises based on this principle. At the simplest level, with the fewest barriers to entry, importers were shown to use commercial air or ferry travel to cross non-land borders. More sophisticated strategies involved corruption-facilitated transport on commercial air flights, recruiting freight operators to carry drugs, shipping drugs among unaccompanied legitimate commerce, mailing drugs into the UK and smuggling by boat between ports of entry. These more sophisticated and more costly operations used a range of 'professional services' including: haulage companies (road, sea and air); mariners; serving army officers in South America and law enforcement officers.

To illustrate how high level enterprises can operate, the operations and financial structure of an actual cocaine importing enterprise, described by one of its imprisoned members, is illustrated in Box 2. This enterprise was particularly large, possibly importing over two tonnes of cocaine into the UK annually which equates to approximately seven per cent of the estimated market size for cocaine (Pudney, 2006). It is not suggested as a typical example, as the wide variety of business practices, and our present lack of knowledge of the mechanics of high level drug dealing operations means that this is not feasible.

What drives the profitability of high level drug dealing businesses?

All businesses can increase their profits by increasing sales (growth); increasing the income generated per sale (increasing price) or reducing their outgoing costs. It is interesting to explore whether and how drug dealers seek to optimise their profitability as this may provide clues on how to restrict their operations.

Do high level dealers maximise income per sale?

Whereas legal firms seek to maximise their profits, it has been argued that illegal enterprises may seek to minimise their risks (Desroches, 2005). One way to assess whether dealers seek to maximise their income per sale is to review how they respond to price fluctuations. Prices fluctuate in all markets as there are changes in the patterns of supply and demand and there is evidence for short term price increases in drug markets (Office of National Drug Control, 2004). Price increases in legitimate markets, in the absence of competition, are typically passed on to lower levels of the supply chain, eventually reaching consumers. There is some evidence to suggest that the same occurs in drug markets although the method by which the price increase is passed on varies depending on market level. Dealers at high levels have suggested they pass on price increases to customers by increasing price; conversely dealers at retail level passed on price increases by reducing quality or did not pass on price increases at all.

Box 2 Operations and financial cost structure of a cocaine importing enterprise in the UK]

The business was run by two partners. One partner lived in Spain from where he interacted with Colombian dealers. The other partner was resident in London and organised the logistics of sale in the UK. In an average week they bought 50 – 60 kilograms of cocaine. They bought from the Colombians at £18,000 / kg and sold for £22,000 / kg. On a typical 10 kg transaction of cocaine worth £220,000, the enterprise made a £40,000 profit minus expenses. Profits were split equally between the two partners. The roles of their staff are described below.

Main courier: Met the Colombian transporters in London, received the cocaine and distributed it across the UK. It would usually be delivered in 10kg amounts. His salary was £500 per transaction plus expenses (around £800 in total). "He could be doing a drop a day".

Money collector: The purchasers delivered cash to London the following day and would meet a "money collector" who would deliver the cash to the "money counter". His salary was £250 per day and he "worked virtually every day".

Money counter: The money counter could typically count £220,000 per day as the money could be in any denomination. Once counted, the money was collected by the "money deliverer". The salary was £250 per day to count however much money he was given. The number of days worked was unclear.

Money deliverer: A woman was used to deliver the money to two places: a Venezuelan woman acting as a link for the Colombians to get their money back to Spain, and a "money holder" who was the partner's friend. Her salary was £250 per day. The number of days worked was unclear.

Money couriers: The interviewee's partner in Spain sent people across to the UK to pick up his profits. The cash was smuggled strapped to their bodies. The salaries are not known.

Driver: The partner employed a driver in London who earned £200 a day.

[Matrix Knowledge Group, 2007]

What do we know about the costs of being a drug dealer?

There are many reasons why illicit drug dealing transactions are inefficient and therefore could incur more costs compared to licit commodity trading. These reasons can be considered to be indirect effects of law enforcement and include:

- potentially many layers separating producers and consumers;
- the high cost for buyers and sellers of finding each other coupled with limited ability to advertise; and
- the high and unpredictable 'turnover' among buyers and sellers as they are arrested and imprisoned. (Reuter & Caulkins, 2004)

We can identify the different cost domains relatively easily. However, we have limited information on the financial value of these costs and how they eat into high level drug dealers' potential for making huge profits. Most information comes from the retail level.

Monetary costs

The monetary costs of running a drug dealing enterprise are very small. As noted above, the cost of the drug from source countries is only a small proportion of its retail price. The main monetary costs for drug dealers are incurred in transferring the drug over policed borders, retailers earning above what they could expect in legitimate employment, and product and asset seizures (by law enforcement agencies, competitors, customers or employees). Additional costs are incurred should dealers seek to purchase drugs on credit. Sellers typically charge more for this service than for money up front (Desroches, 2005 and Matrix Knowledge Group, 2007). Perhaps because the monetary costs are small, the Matrix research found that high level drug dealers did not typically prioritise monetary cost control.

An important paper by Caulkins and Reuter (Caulkins and Reuter, 1998) estimated the proportion of the retail price contributed by each of these costs. It determined that:

- twelve per cent of the retail value of cocaine was due to the cost of moving the drug across US borders;
- thirteen per cent of the retail value was due to the earnings of retailers; and
- between eight and 11 per cent of the retail value was due to product and asset seizures by law enforcement, competitors, customers or employees.

However, these estimates were calculated using information from multiple data sources rather than directly from individual drug dealing businesses. Box 2 includes cost data from such a business. It demonstrates that for this enterprise the wage bill comprised 0.8 per cent of revenue and four per cent of profit). Data such as these are rare and are a major gap in our knowledge of drug dealing markets.

Non-monetary costs

The non-monetary costs of drug dealing are more substantial. They include the risk of imprisonment and the risks of dealing with other criminals, such as violence. It has been estimated that 24 per cent of the retail price of cocaine is a premium that consumers pay to drug dealers to compensate them for their risk of imprisonment. Likewise, 33 per cent of the retail price of cocaine is paid to compensate dealers for their risk of death or injury (Caulkins & Reuter, 1998). Again, these estimates should be treated with caution. Data on the non-monetary costs associated with drug dealing are even rarer than monetary costs and where calculations have been attempted, as with economic analysis of all markets, they are based on assumptions about individuals behaving rationally. Furthermore, obtaining the data directly from drug dealers is difficult.

Risk management

There is evidence that high level drug dealers take active steps to reduce non-monetary costs. Desroches (2005) and others (Pearson & Hobbs, 2001 and Reuter & Haaga, 1989) identify that dealers acknowledge that violence is bad for business and take steps to avoid it, and that it is possible to operate as a high-level dealer without using violence. Some researchers have suggested that many dealers think the risks of operating in the drug market are low (Dorn, Levi and King, 2001) and others have identified that individual dealers have different risk tolerance levels (Dorn, Oette & White, 1998). For example, some dealers go to significant lengths to ensure they are not in contact with the drugs at any point in a deal by employing staff to take on this role despite the inefficiencies this generates. Others may enjoy the excitement of completing drug deals and involve themselves more closely in operations.

The Illicit Drug Trade in the UK

Table 1 outlines a number of risk management strategies reported by drug dealers in the illicit drug trade in the UK. Unlike in legitimate business, where a key concern is that demand will fall, drug dealers did not appear to need to manage risks related to low demand. The majority of the risks that were identified related to the supply side of the business.

Market risks were defined as factors affecting the stability of the market, e.g. lack of demand for or supply of drugs. Business risks affected the ability to run a profitable business e.g. managing costs. Credit risks affected the businesses' cash flow e.g. drugs/money being stolen. Operational risks affected the logistics of undertaking transactions, e.g. being arrested. Risks to reputation were factors that affected whether individuals could maintain their reputation in the market.

Operational risks were the most frequently discussed and all dealers interviewed in the Illicit Drug Trade in the UK took steps to avoid law enforcement. High level drug dealing businesses can innovate and adapt to law enforcement operations through switching routes, or developing more sophisticated methods of smuggling. Law enforcement is thought to generate greater risks per transaction at street level rather than higher market levels (Reuter, MacCoun & Murphy, 1990). This presents significant challenges for law enforcement agencies seeking to use their resources to curtail the wholesale supply of illegal drugs.

Dorn, Levi and King (2005) attempted to describe the different approaches of high level drug dealers to law enforcement operations. 'Politico-military traffickers' are resistant to judicial intervention because of geographical inaccessibility, military power, intimidation of legal personnel and/or political protection. Disrupting their activities may depend on removing their political or military allies. 'Business criminals' are vulnerable to judicial systems only after their assets have been degraded. Law enforcement efforts can increase their business costs but continuous pressure is needed to achieve this and new trafficking groups may arise. 'Adventurers' are relatively easy to arrest and one off seizures by law enforcement or competitors may cause them to stop trafficking, however, there are likely to be new recruits.

Dealers also face significant costs in moving their profits into the legitimate financial system. Globalisation and the continual 'arms race' between high-level drug dealers and law enforcement will generate ever more sophisticated means of laundering money. Currently, drug dealing businesses are likely to launder their money through making numerous small deposits or using cash-based businesses as a front for their operations. Cash is also exported either by use of money couriers or electronic transfer using money service businesses. Investing in property overseas can also be a means of hiding assets. Contacts within financial institutions who can assist with these transactions are valuable. However, research has also found that high level dealers do not always invest their money for the future. They may instead use their profits to fund lavish lifestyles (Matrix Knowledge Group, 2007).

EXAMPLES OF RISK MANAGEMENT

Substantial numbers of interviewees in the Matrix study did not consciously consider themselves to be risk managers, but it was common for interviewees to identify complex risk management strategies throughout interviews.

Some studies have attempted to identify which enforcement responses would deter drug dealers and so would mean dealers needed to be more certain of their rewards before undertaking deals. Research

Table 1 Examples of risk management strategies used by dealers

Type of risk	Risk identified	Interviewee identified risk management strategies
Market risk	Low demand	• No need for strategy because demand was found to be high and stable
Market risk	Low supply	• Find reliable supplier • Identify more than one supplier
Business risk	Financial loss through confiscation	• Separation of cash and drugs • Set up legitimate business
Credit risk	Other dealers stealing drugs/money	• Threaten violence • Actual violence
Operational risk	Getting caught with drugs/money	• Only buying drugs when a customer is lined up • Limited stockpiling of drugs • Payment of customs official • 'Sacrifice' of mules • Many mules on one flight carrying small amounts • Employment of staff, e.g. managers, transporters, storers
Operational risk	Attracting attention of police	• Limiting the number of customers • Spend money on rental goods, e.g. rented houses, cars
Operational risk	Police monitoring of operations including use of informants	• Only work with and sell to known individuals • Using face-to-face communication or calling from a pay phone • Regularly changing phones
Risks to reputation	Inability to enforce contracts	• Threaten violence • Actual violence

based on interviews with drug importers in the US concluded that the biggest deterrents were the threat of informants, either cooperating defendants or confidential informants, prison terms of 25 years or greater and the possibility of being prosecuted despite not being caught in possession of the drug (conspiracy charges) (Layne et al, 2001). However, research has also indicated that prison does not necessarily cause the operations of high drug dealing businesses to cease. Businesses can be passed on either to family members or other members of the enterprise following arrest (Matrix Knowledge Group, 2007).

How do dealers grow their operations?

Desroches (2005) identified a number of characteristics of dealers who were able to progress from retail to wholesale level, despite the inherent mistrust that higher level dealers appear to possess for those working at street level (Matrix Knowledge Group, 2007). These included: working for a significant length of time at street level (one to five years) which enabled them to develop higher level sources, establishing a reputation as trustworthy and successful, recognising and exploiting opportunities for advancement, acquiring funds to make bigger purchases. After making the move, dealers reduced the number of people dealt with, became less visible and distanced themselves from drug users.

A critical challenge in growing a drug dealing business is access to a reliable supplier or network of suppliers. Matrix's research supported the theory that suppliers are a scarce resource at wholesale and importation levels. Having access to multiple suppliers improves dealers' opportunities to maintain and expand their supply. Dealers can use alternative sources if one supplier is not able to access cocaine or heroin when the dealer requires it.

Some higher level dealers were able to expand simply by operating in the drug dealing environment. Like those working in legitimate business, they met other dealers with similar interests and ideas for making more money. Some interviewees reported that prison facilitated making new contacts. In order to fully exploit these contacts, dealers needed to be able to present themselves as trustworthy. Having previously served time in prison was also a means of demonstrating trustworthiness. Ethnic ties proved helpful for some dealers in expanding their networks into other cities or countries.

Contacts working in legitimate businesses in particular the transportation industry, who were prepared to be involved in drug dealing, also facilitated drug dealers expanding. Some dealers were able to expand by selling to their friends who were using drugs and, who in turn sold to their friends. Desroches (Desroches, 2005) reports that willingness to provide credit can enable individuals to expand.

What are the achievable goals of law enforcement?

This section discusses what we can expect law enforcement to achieve in two important dimensions: how it can influence drug markets, and how it can influence the side-effects or externalities of market transactions.

Influencing drug markets

The threat of legal consequences and the restricted availability of illegal drugs prevent some but not all people from using, buying, and selling them. Some people will be prepared to use illegal drugs and, because they are relatively simple to produce and their restricted availability inflates prices, individuals prepared to be involved in the market stand to make large profits. When viewed in the context of a market, preventing the buying and selling of all illegal drugs is not an achievable goal of law enforcement.

Furthermore, established drug markets possess features that may make them more 'resilient', or able to maintain the frequency of transactions between buyers and sellers, to law enforcement responses than other illegal or heavily regulated markets. These features can be characterised as:

- Low vulnerability: At a macro level, drug markets are able to insulate or protect themselves from law enforcement operations. The frequency of transactions does not appear to be affected by arrests or seizures.

- A high elasticity to external shocks: When law enforcement does cause a disruption to supply, drug markets usually recover to pre-disruption levels quickly.

- A high capacity to adapt: Drug markets can respond to law enforcement disruptions by reconfiguring their structures to make themselves less vulnerable e.g. employing different transportation routes (Bouchard, 2007).

These characteristics have led commentators to suggest that enforcement's effectiveness at suppressing drug use declines markedly as the size of a drug market grows (Tragler et al, 2001 and Kleiman 1993). However, as a new drug market is emerging law enforcement responses may be effective at preventing the spread of drug use and furthermore, law enforcement policy options have comparative advantages over other prevention and treatment policy options at this stage (Caulkins, 2007). Caulkins has argued that because law enforcement, unlike prevention or treatment programmes, can concentrate its effects in specific locations at particular times it is uniquely placed to prevent or disrupt emerging drug markets. Law enforcement can therefore play a valuable role in circumscribing potential drug epidemics that, without intervention, could involve many people and produce a large burden of harms. Law enforcement has a particular role to play in reducing or preventing future, unforeseen harms by tackling dangerous drugs at the early stages of epidemic cycles.

In more established markets the goals of law enforcement are more circumscribed. Enforcement operations against high level drug dealing enterprises are difficult undertakings. Agencies need to take a proactive approach because there are no complainants; buyers and sellers are both willing participants, and the response requires use of undercover agents, surveillance technologies and informants, all of which are expensive undertakings which require close monitoring (Desroches, 2005). While these operations are restricted in the direct impact they have on drug markets, an indirect effect of them is to make dealers more wary of informants and lead them to take steps that reduce the risk posed by informants (Matrix Knowledge Group, 2007). Fear of informants potentially restricts the opportunities for drug dealers to expand.

Informants are also a source of information on what drug dealers find difficult or potential weak links in supply chains, which could then receive more attention from law enforcement agencies. However, in assimilating information about what drug dealers find difficult, a key weakness is our inability to predict the impact of different law enforcement tactics. Drug markets are dynamic systems that can respond to enforcement in unpredictable ways that may cause a different pattern of harms. For example, success in increasing seizures may lead to increased competition and increased violence, or success in reducing the market for imported cannabis resin could lead to accompanied growth in domestically produce sensimilla, involving a different set of criminals, about whom there is less intelligence.

It may be that the best strategies for law enforcement agencies in established markets are those that target dealers at all levels of the market in flexible, novel, and unanticipated ways that, at least, increase the unpredictable risks to market actors and therefore reduce their efficiencies.

Influencing market externalities

Precisely because the drug market is illegal and participation in it is punished, people who use illegal drugs expose themselves to more harms than in a legitimately regulated market. But, it is not only drug users who suffer harms due to the illegality of drugs. Market transactions have effects on individuals who were 'bystanders', playing no part in the buying and selling. These externalities associated with drug markets include, violence, corruption, and fear of visible drug markets and they affect both drug users and non users.

A further achievable goal of policing is, therefore, to limit these externalities. Law enforcement agencies are uniquely positioned to do this because of the varied range of responses at their disposal. Treatment and prevention are limited to focusing on reducing the actual and future harms to drug users and their families, and so can only indirectly and to a small degree influence broader market externalities. However, depending on the nature of the local drug markets, law enforcement can use arrests, seizures, harassment, incarceration, or asset recovery to reduce external harms or to convert markets into less destructive forms, for example, by forcing visible street dealing to become more discreet. There is a small amount of evidence on how best to achieve this. Research has demonstrated that, when policing street-level drug markets, law enforcement is most effective at reducing externalities when it is geographically focussed and works in partnership with third parties, such as local authorities and drug treatment service providers (Mazerolle et al 2007). At higher levels of the markets through careful targeting of operations it is possible for law enforcement to remove violent drug dealers and enterprises which compromise legitimate organisations, law enforcement, and the stability of communities (Dorn, 2000).

Enforcement approaches should also seek to ensure that they act in ways proportionate to the harms caused by different individuals and businesses operating in drug markets. There may be merit in tailoring sentences of individuals according to the specific roles that individuals were playing. For example, long prison sentences for drug mules, paid relatively small amounts of money to import drugs will do little to reduce the harms caused by drug markets but require a proportionately large number of resources to enforce.

Gaps in knowledge

Policy makers need information that can help them to understand how drug markets cause harms to society (Reuter, 2000). Better understanding of the structure and operations of drug markets will improve our understanding in this complex area as well as assisting law enforcement agencies chose where and when they should focus their activities. It has been suggested that there is a particular need for research in three areas that can inform our understanding of how different harms are connected:

1. Geographic substitution: To what extent can producers and traffickers thwart enforcement in one geographic area by moving production or smuggling routes elsewhere?
2. Deterrence: How can the deterrent effects of supply-reduction activities be measured and how large are they?
3. Adaptation: What is the time lag between successful enforcement operations and adaptive responses on the part of producers and traffickers? (Committee on Data and Research for Policy on Illegal Drugs, 2001)

These questions provide a starting point for structuring research programmes but posing these questions is easier than providing the answers. No one discipline can adequately describe the complexities of any market, rather it is necessary to develop our understanding by integrating different subjects including: anthropology, sociology, economics, behavioural and psychological research, population-based and survey research, criminology and law enforcement evaluation (Ritter, 2006). Creative thinking about how findings from one research discipline can suggest future research projects in others has previously been lacking in the study of illegal drug markets.

Conclusion

Experience has shown that it is extremely difficult for law enforcement agencies to achieve a significant and sustained impact on the overall scale of illicit drug markets. However, there is clear evidence that some enforcement activities can impact on the structure and methods of operation of trafficking organisations at all levels – from production to retail distribution. This review of studies examining the behaviour of drug dealers shows that they do (sometimes unconsciously) adjust their operations in response to law enforcement strategies and actions, but to a large degree continue to pursue the same principles as any legitimate commodity business – setting of margins, and management of risk. Much greater analysis and understanding of market behaviour is needed if the international law enforcement community is to increase its effectiveness in reducing the harms associated with the illegal market in controlled drugs – an important conceptual step would be for strategists to focus more on the harms associated with drug markets (for example, violence and intimidation, or the corruption of public officials), rather than just the overall scale of those markets.

References

Bewley-Taylor, D., Trace, M., & Stevens, A. (2005). Incarceration of drug offenders: Costs and impacts. Briefing paper 7. Oxford: Beckley Foundation.

Bouchard, M. (2007) On the Resilience of Illegal Drug Markets. Global Crime 8(4)

Bouchard, M. (2006) Segmentation et structure des risques d'arrestations dans les marches de drogues illegales. Doctoral disseration, School of Criminology, University of Montreal.

Boyum, D. (1992) Reflections on Economic Theory and Drug Enforcement. Doctoral dissertation in public policy, Harvard University, Cambridge, MA.

Caulkins, J.P. (2007). The need for dynamic drug policy. Addiction, 102, 4-7.

Caulkins, J.P. (1995). Estimating elasticities of demand for cocaine and heroin with data from the Drug Use Forecasting system (Working paper 95-13) Pittsburgh, PA: School of Urban and Public Affairs, Carnegie Mellon University

Caulkins, J.P. Burnett, H. Leslie, T. (forthcoming) How Illegal Drugs Enter an Island Country: Insights from Interviews with Incarcerated Smugglers.

Caulkins, J.P., Reuter, P. (1998). What price data tell us about drug markets. Journal of Drug Issues 28(3) 593-613.

Caulkins, J.P., MacCoun, R.J. (2003). Limited Rationality and the Limits of Supply Reduction. Journal of Drug Issues. 33(2), 433-464.

Committee on Data and Research for Policy on Illegal Drugs, Charles F. Manski, John V. Pepper, and Carol V. Petrie, Eds (2001) Informing America's Policy on Illegal Drugs: What We Don't Know Keeps Hurting Us. Committee on Law and Justice and Committee on National Statistics, National Research Council.

Desroches, F.J. (2005). The Crime That Pays: Drug Trafficking and Organised Crime in Canada. Toronto: Canadian Scholars' Press Inc

Desroches, F.J. (2007). Research on upper level drug trafficking: A review. Journal of Drug Issues. 7(4), 827-844.

Dorn, N. (2000). Performance management, indicators and drug enforcement: in the crossfire or at the crossroads? In Natarajan, M., Hough, M. (eds), Illegal Drug Markets: From Research to Prevention Policy, Monsey NY: Criminal Justice Press.

Dorn, N., Levi, M., King, L. (2005) Literature review on upper level drug trafficking. Home Office Online Report 22/05. London: Home Office

Dorn, N. Oette, L., White, S. (1998) Drugs Importation and the Bifurcation of Risk Capitalization, Cut Outs and Organised Crime. British Journal of Criminology. 38(4), 537-560.

EMCDDA (2007). Annual Report 2007: The State of the Drugs Problem in Europe. Lisbon: EMCDDA.

Fritter, R., Kaplinsky, R. (2001) Who gains from product rents as the coffee market becomes more differentiated? A value chain analysis. IDS Bulletin Paper

Hunt L.G. (1974). Recent spread of heroin use in the United States. American Journal of Public Health, 64 (Supplement), 16-23.

Kleiman M. A. R. (1993) Enforcement swamping: a positive feedback mechanism in rates of illicit activity. Math Comp Model 17: 65–75.

Layne, M. et al (2001) Measuring the deterrent effects of enforcement operations on drug smuggling, 1991-1999. Washington: Office of National Drug Control Policy.

MacCoun, R.J., Reuter, P. (2001) Drug War Heresies. New York: Cambridge University Press.

Marsh, K. (forthcoming). Price variation in the UK market for cocaine and heroin.

Matrix Knowledge Group (2007). The illicit drug trade in the United Kingdom. Home Office Online Report 20/07. London: Home Office.

Mazerolle, L., Soole, D.W., Rombouts, S. Crime Prevention Research Reviews No. 1: Disrupting Street Level Drug Markets. Washington D.C.: U.S. Department of Justice Office of Community Oriented Policing Services.

Moore, M.H. (1973). 'Policies to Achieve Discrimination on the Effective Price of Heroin'. The American Economic Review. 63(2), 270-277.

Moore, M.H. (1977). Buy and Bust: The Effective Regulation of an Illicit Market in Heroin. Lexington, MA: Lexington Books.

Office of National Drug Control Policy (2004). Technical Report For The Price and Purity of Illicit Drugs: 1981 Through the Second Quarter of 2003. Washington DC: Executive Office of the President (Publication Number NCJ 207769).

Paoli, L. Reuter, P. (2008). Drug Trafficking and Ethnic Minorities in Western Europe. European Journal of Criminology. 5(1),13-37.

Pearson, G., Hobbs, D. (2001). Middle Market Drug Distribution. Home Office Research Study 227. London: Home Office.

Pudney, S. (2006) Estimating the size of the UK illicit drug market. In Singleton, N. et al (eds) Measuring different aspects of problem drug use: methodological developments. Home Office Online Report 16/06. London: Home Office.

Reuter, P. (2000) Epilogue: connecting drug policy and research on drug markets. In Natarajan, M., Hough, M. (eds), Illegal Drug Markets: From Research to Prevention Policy, Monsey NY: Criminal Justice Press.

Reuter, P., Caulkins, J.P. (2004). Illegal "lemons': price dispersion in cocaine and heroin markets. Bulletin on Narcotics. 56(1,2) 141-165.

Reuter, P., Greenfield, V. (2001). Measuring Global Drug Markets: How good are the numbers and why should we care about them? World Economics, 2(4) 159 - 173.

Reuter, P, Haaga, J. (1989). The Organization of High-Level Drug Markets: An Exploratory Study. Santa Monica: Rand.

Reuter, P. MacCoun R., Murphy (1990) Money from Crime: A Study of the Economics of Drug Dealing in Washington, D.C. Santa Monica: Rand.

Riley, K.J. (1997) Crack, Powder Cocaine, and Heroin: Drug Purchase and Use Patterns in Six U.S. Cities. National Institute of Justice, Washington, DC.

Ritter, A. (2006) Studying illicit drug markets: Disciplinary contributions. International Journal of Drug Policy 17 453-463

Skott, P., & Thorlund Jepsen, G. (2002). Paradoxical effects of drug policy in a model with imperfect competition and switching costs. Journal of Economic Behavior & Organization, 48(4), 335-354.

Storti, C.C., De Grauwe, P. (2007). Globalisation and the price decline of illicit drugs CESifo Working Paper No. 1990.

Substance Abuse and Mental Health Services Administration. (2007). Results from the 2006 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, NSDUH Series H-32, DHHS Publication No. SMA 07-4293. Rockville: MD.

Tragler G., Caulkins J. P., Feichtinger G. (2001) Optimal dynamic allocation of treatment and enforcement in illicit drug control. Operational Research 49: 352–62.

United Nations Office on Drugs and Crime (2007). 2007 World Drug Report. Vienna: United Nations.

UNODC, *Sweden's Successful Drug Policy:* A Review of the Evidence, September 2006