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Research paper

Risks, prices, and positions: A social network analysis of illegal drug trafficking in the world-economy

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ABSTRACT

Background: Illegal drug prices are extremely high, compared to similar goods. There is, however, considerable variation in value depending on place, market level and type of drugs. A prominent framework for the study of illegal drugs is the "risks and prices" model (Reuter & Kleiman, 1986). Enforcement is seen as a "tax" added to the regular price. In this paper, it is argued that such economic models are not sufficient to explain price variations at country-level. Drug markets are analysed as global trade networks in which a country's position has an impact on various features, including illegal drug prices.
Methodology: This paper uses social network analysis (SNA) to explain price markups between pairs of countries involved in the trafficking of illegal drugs between 1998 and 2007. It aims to explore a simple question: why do prices increase between two countries? Using relational data from various international organizations, separate trade networks were built for cocaine, heroin and cannabis. Wholesale price markups are predicted with measures of supply, demand, risks of seizures, geographic distance and global positioning within the networks. Reported prices (in $US) and purchasing power parity-adjusted values are analysed.
Results: Drug prices increase more sharply when drugs are headed to countries where law enforcement imposes higher costs on traffickers. The position and role of a country in global drug markets are also closely associated with the value of drugs. Price markups are lower if the destination country is a transit to large potential markets. Furthermore, price markups for cocaine and heroin are more pronounced when drugs are exported to countries that are better positioned in the legitimate world-economy, suggesting that relations in legal and illegal markets are directed in opposite directions.
Conclusion: Consistent with the world-system perspective, evidence is found of coherent world drug markets driven by both local realities and international relations.

Illegal drugs are extremely valuable: some types of drugs are literally worth their weight in gold (Reuter & Greenfield, 2001). There is, however, considerable variation in value depending on place and market (Caulkins & Reuter, 1998; Wilson & Stevens, 2008). For example, a kilo of cocaine that is worth less than $US 1000 in Bolivia could easily sell for more than $US 100 000 in the streets of the United States, Australia, or France (UNODC, 2011). Traditional economic models provide a partial explanation of why drugs are more expensive in some countries than others because in many ways, drug markets act as trade networks; buyers and sellers willingly collaborate in an effort to exchange a commodity (Caulkins & Reuter, 2007, 2010; Naylor, 2003).

However, a clear difference between drug markets and other trade networks is the legal status of the commodity. It has long been recognized that the price and value of illegal commodities cannot be fully explained by ordinary laws of supply and demand. The main proposition of the current paper is that a country's position within global markets affects wholesale prices of illegal commodities, a proposition underexploited in previous explanations. Drawing on the larger literature on legal trade, this paper uses social network analysis (SNA) to explain price markups between pairs of countries involved in the trafficking of illegal drugs. It draws on Reuter & Kleiman's risks and prices model and Wallerstein's world-system perspective to analyse contemporary illegal drug markets. An empirical analysis of wholesale prices of cocaine, heroin, and cannabis for a sample of 173 countries from different parts of the world is presented and discussed.

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Prices, costs and risks

The price of any commodity is expected to continually increase as the commodity moves from source to user. The first owner will sell his product at a price high enough to cover his own costs and eventually make some profit. That buyer will likely sell at a higher price, again to cover his own costs (which include the costs of the first owner) and make some profit, and so on. Costs are passed on to the next buyer, who passes them on to the next, etc. until the commodity reaches the final buyer – the user. In other words, prices are in part determined by costs incurred by previous sellers who are not involved in a given transaction. Where buyers are positioned in the chain is closely associated to the purchase cost of commodities.

In addition to other expenses, traders of illegal commodities incur specific costs. A prominent framework for the study of illegal drugs is the "risks and prices" model (Reuter & Kleiman, 1986). Enforcement is seen as a "tax" – an additional cost added to the regular price. The model is conceptualized as a sequence of related effects. First, enforcement imposes costs on drug dealers, in the form of drug and asset seizures, compensation for risk of prison, and compensation for risk of violence from other participants of illegal markets (Caulkins & Reuter, 1998). Second, "drug dealers are in business to make money, so they pass [their] costs on to users in the form of higher prices" (Caulkins & Reuter, 2010, p. 215). Because it is assumed that the main objective of drug law enforcement is to reduce drug consumption, Reuter & Kleiman's third and final proposition is that higher prices reduce consumption. In the strictest sense, enforcement efforts are successful only if they cause a significant reduction in drug consumption.

Such a theory requires considerable empirical testing, and more than 25 years of research has brought important insights on all three propositions. The most disappointing finding is that law enforcement is rarely able to disrupt or seriously damage drug markets (proposition 1; Layne et al., 2001; Mazerolle, Soole, & Rombouts, 2001). At best, law enforcement interventions may have a confined or temporary impact on specific markets, without redefining global markets.

The focus of this paper is on the second proposition of the risks and prices model. While the existence of additional costs related to drug enforcement is undisputed, how and when they are passed to users is still a matter of discussion (Caulkins, 1994; Caulkins & Reuter, 1998; DeSimone, 2006). The value of illegal drugs increases almost exponentially after production, while price increases are more modest for legal commodities (Reuter & Greenfield, 2001). A version of this argument can be used to explain wholesale price variations at country-level. It is expected that illegal drug prices will be higher where costs imposed on drug traffickers are higher. The context in which traffickers operate is crucial: if enforcement efforts are weak or fairly easy to avoid, additional costs imposed on traffickers are low and drug prices should be lower. On the contrary, if the risks associated with trafficking are high, costs are high, and prices will be high. The corollary is that traffickers who acquire drugs at lower prices and assume fewer costs are able to sell at lower prices; at country-level, it means that traffickers operating where enforcement has minimal effects on drug prices have lower costs than traffickers operating in high-risk countries. Consequently, the structure of transnational drug trafficking is a key element in a better understanding of price variations.

Drug trafficking in the world-economy

Structure may, however, have a more subtle effect on commodity prices. It is expected that some countries will have more wealth than others due to differential access to raw materials, more effective production means, lower wages, etc. The world-system perspective argues that today's world-economy is a global trade network "built" on unequal political and economic agreements (Chase-Dunn, 1989, 2002; Wallerstein, 1974, 1979). The world-system argument is thus not only that some countries have more wealth than others, but that they have it at the expense of others. Proponents of the world-system perspective hold that the core-periphery hierarchy does not necessarily refer to geographic regions but rather to countries that occupy similar positions in the world-economy. Examples of core countries are the United States and Japan, and of peripheral countries, Togo and Senegal. Semi-peripheral countries, such as New Zealand and Argentina, are less dominant but still occupy an important position in the world-economy (Chase-Dunn, 1989; Mahutga, 2006; Smith & White, 1992; Snyder & Kick, 1979; Wallerstein, 1974, 1979).

In the legal world-economy, peripheral and semi-peripheral countries are not able to produce necessary specialized commodities and must depend on core countries, which sell such commodities at a high price. It has been argued that the situation is reversed for illicit drugs (Boivin, 2013): core countries are not able to produce enough – if any – drugs to meet national demand and are forced to import from more peripheral countries. The situation is most obvious for cocaine and heroin, which are produced in a limited number of non-dominant countries. Position in the system is thus a direct function of means of production. An important structural consequence is that, all other things being equal, prices are higher than they should be in importing countries. In other words, because core countries depend largely on more peripheral countries for their supply of illegal drugs, prices are expected to increase more rapidly when the trade is directed towards the core of the world-economy.

Trade networks

A major contribution of the world-system perspective was to shift the focus of analysis from individual countries to the relations between them. Empirical tests of the world-system perspective then quickly used tools of social network analysis (SNA). A similar trend can be observed for drug trafficking: recent editions of the *World Drug Report*, a widely-cited annual publication by the United Nations Office on Drugs and Crime (UNODC), include a discussion of drug "flows" and "routes" between countries. In a recent publication, Paoli, Greenfield, and Reuter (2009) used the network terminology to describe the world heroin market as a trade network in which distant regions can affect aspects of local markets, but grounded their analysis in traditional economics.

However, Paoli et al.'s work is a notable exception: drug trafficking is usually not analysed in relational terms. Farrell, Mansur, and Tullis (1996), who analysed cocaine and heroin trafficking in Europe during the 1980s and 1990s, still provide the most comprehensive examination of wholesale prices. Their analysis is interesting because it shows how European drug markets evolved over a 10-year period (1983–1993). It also introduces the idea that countries had steady roles in the market throughout the period and that a wide array of factors explain that situation. Farrell et al. observed that wholesale prices were lower in the countries that serve as gateways to the European markets – Spain, Portugal, and Turkey. In neighbouring countries, drugs were a little more expensive, but still cheaper than in most other countries, which is consistent with the idea that prices increase with distance. They also observed that drugs were expensive in Switzerland and concluded that it reflected a more general pattern: everything was more expensive in Switzerland. Finally, Farrell et al. suggested that the level of risk for importers was associated to wholesale prices, citing the example of the Netherlands, a country that was thought to be more lenient about drugs and where lower than expected prices were observed.