Research paper

An island apart? Risks and prices in the Australian cryptomarket drug trade

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ABSTRACT

Background: Australia has a reputation as an anomaly with regard to cryptomarket drug trading, with seemingly disproportionately high levels of activity given its relatively small size, high prices and anecdotal accounts of it being a destination where many foreign-based vendors will not sell. This paper aims to investigate these claims from a risk and prices perspective.
Methods: By analysing data for over 60,000 drug products available for purchase from eight cryptomarkets in January 2016 this work builds a descriptive picture of the Australian online market in comparison to the rest of the world, before moving onto analyse the prices of drugs available to Australian consumers, both online and though conventional drug supply routes.
Results: Results show that the Australian online illicit drugs market is of considerable size, internally isolated and with methamphetamine sales being particularly large by comparison to other countries. Australian cryptomarket vendors sell drugs at significantly higher prices than those listed by their foreign counterparts. Online prices are however broadly comparable to street prices, with the exception of methamphetamine where prices appear to be much lower online.
Conclusions: These findings indicate that the perceived stringency of Australian border protection inadvertently increases the competitiveness and local market share of domestic cryptomarket vendors via a consumer side 'risk tariff', challenging the traditionally vendor-oriented drugs risk and prices framework.

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Introduction

Since the formation of the infamous and now defunct *Silk Road* in 2011, the use of cryptomarkets to trade illicit drugs has greatly expanded. By 2015, revenues from drug sales were thought to be in excess of $100 million USD worth of illicit drugs per annum (Soska & Christin 2015:40) and estimated to be around about $170 million USD by 2016 (Kruithof et al. 2016). Research has suggested that the design and regulatory mechanisms of these marketplaces may make drug selling less risky than conventional methods by connecting buyers and sellers via digital systems (principally Tor and Bitcoin) and postal networks (Martin, 2014a, 2014b; Van Hout & Bingham, 2013a), rather than through conventional interpersonal networks that are often complex, lengthy and highly stratified (see, for example, Malm & Bichler, 2011). Similarly, the

risk from law enforcement may be reduced as traditional anti-drug policing operations, such as buy-bust undercover operations and raids on drug retailing hotspots have less success (Décary-Hétu & Giommoni, 2016; Martin, 2014b) and more resource-intensive and unfamiliar modes of investigation such as cyber-investigations that seek to exploit information leakage in Tor connections (Huber, Mulazzani, & Weippl, 2010; Geddes, Jansen, & Hopper, 2013), bitcoin transactions (Reynolds & Irwin, 2017) or wider disruption of both the actors and the markets (cf. Hutchings & Holt, 2016, and disruptions to the trade in stolen data) are still in their infancy. Online anonymity and physical separation of participants may also reduce violent interactions, thereby substantially reducing another important source of risk affecting street dealers as they do business. Barratt, Ferris, and Winstock's (2016) analysis of cryptomarket users in the Global Drug Survey found that these buyers reported fewer threats and less violence than reported in connection to traditional offline markets, including through strangers, known dealers and even friends. The study also found that other comparative risks were lower in connection to

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cryptomarket buying, including the risks of arrest and rip-off, although "exit-scams" are a real concern and have considerable impact on cryptomarket usage (Soska & Christin, 2015).

With their 'risks and prices' framework (RPF), Reuter and Kleiman (1986) argue that the price of illegal drugs is determined not only in connection to the material costs associated with production, distribution and selling, but also the non-material costs associated with the illegal status of the goods and services. Critical here are the costs connected to risks taken by drug suppliers in their activities. Décary-Hétu, Paquet-Clouston, and Aldridge (2016) have identified the risks that drug dealers face in a range of domains, including the risk of violence, risk to profit and reputation, and the risk of arrest. According to Reuter and Kleiman (1986), these risks will be assessed by sellers in the drug supply chain on the basis of their perceived likelihood and severity, and then 'monetised' in the form of price increases that are passed on to consumers as financial compensation. Empirical research provides support for the RPF (see Grossman, Chaloupka, & Shim, 2002; Levitt & Venkatesh, 2000; Weatherburn, Lind, Jochelson, & Dubow, 1995). Caulkins and Reuter (2010), for example, estimate that in the United States approximately one quarter of the retail price of cocaine is due to distributors increasing prices in order to compensate them for the risk of incarceration, while up to one third of the price is due to compensation for risks of interpersonal violence.

However, applying the RPF to drug markets is fraught with methodological and empirical complexities. Drug markets are notoriously heterogeneous, comprising both 'open' and 'closed' varieties. They vary significantly in size and value, as well as in the overall length and stratification of supply chains. Illicit drug markets have widely varying levels of risk, competition and profitability (Coomber 2010, 2006; Pearson, Hobbs, Jones, Tierney, & Ward, 2001), and the role that an apparent increase in risk plays may be counterintuitive (Bright & Ritter 2010; Caulkins and Reuter 2006; Poret 2003; Skott & Gepsen 2002; Pollack & Reuter, 2014). Complex interactions between innumerable, unanticipated and sometimes unquantifiable 'real world' variables challenge the predictive capacities of the RFP – a problem regularly encountered when neat economic modelling runs up against the intricate and messy reality of a real world marketplace (Bouchaud, 2008). Critiques have also been made regarding the assumption inherent to the RPF that drug dealers are rational actors who set prices on the basis of accurately perceived risk (see, for example, Caulkins and MacCoun 2003). Indeed, it has been argued that cryptomarkets may function as illicit knowledge sharing communities enabling drug sellers to access more and improved information to inform risk assessments (Aldridge & Askew, 2017). While it is nevertheless prudent to remain mindful of the constraints on rationality (see Jacobs & Wright, 2010), the RPF remains a widely employed conceptual framework whereby pricing data may be used to estimate and measure the risks associated with participation in illicit drug markets.

Do cryptomarket buyers and sellers transact in an environment with reduced risk of conflict and violence? Do they face lower risk of apprehension and arrest when accessing illegal drugs in this way? Is the risks of rip-offs and other loss such as parcel interceptions by postal and borders officials lower? Ascertaining these relative risks in cryptomarket drug trading may be addressed at least in part by establishing the effect of these marketplaces on the pricing of substances made available for sale. If cryptomarkets function to reduce the various risks involved in the illegal drug trade, as Aldridge, Stevens, and Barratt (2017) argue is indeed the case, the RPF would predict that drug prices should be lower than those found in offline markets.

Australia represents an ideal case study for an analysis of the RPF on cryptomarket drug prices for a number of reasons. Van Buskirk et al. (2016a) demonstrated that cryptomarkets enjoy unusual popularity in Australia, with the highest number of unique sellers per capita on the now-defunct Agora marketplace and research by Kruithof et al. (2016) found that transactions per-vendor generated by Australian sellers was exceeded only by vendors based in the UK and Germany. Australia's geographical isolation as an island continent, alongside its distance from global drug trafficking routes, may on the one hand account for the popularity of cryptomarket trade in the country, providing Australians with a new point of access to previously unavailable or prohibitively expensive drugs. On the other hand, relative isolation from global trading routes may also have allowed Australian law enforcement efforts to centre largely on its domestic drug markets (Ritter, Lancaster, Grech, & Reuter, 2011), creating additional layers of effort and risk for those trafficking illegal drugs into Australia, and thereby translating into retail drug prices at the top of international league tables (Global Drugs Survey, 2015). In 2014 the Australian government announced an $88 million increase in funding for screening its borders, with the number of mail items required for screening to increase by 10 million to 50 million items and seizures at Australia's borders for a wide range of illegal substances have risen sharply in recent years, both in overall quantities seized and in numbers of seizures (Australian National Audit Office, 2015).

Two research designs have been deployed by researchers to examine price differentials between cryptomarket versus offline purchased substances. In the first, data were obtained in connection to drug samples submitted by users to the Dutch Drug Information Monitoring System. Service users were able to self-report where the drug had been purchased (online or offline), and the price paid for the drug. Researchers found that prices were mostly higher online, ranging from 10 to 23% higher although with marginally high purities (Van der Gouwe, Brunt, van Laar, & van der Pol, 2016). The second methodology employed by researchers is the use of crawler-based methods in which data are downloaded directly from cryptomarkets, the so-called 'digital trace' method (Décary-Hétu & Aldridge, 2015). First employed by Christin (2013) to study the now defunct Silk Road, digital trace methods are particularly valuable because they generate large datasets comprising near-complete populations in comparison to the often partial and so less representative samples obtained through self-report methods or in connection to law enforcement activities (Barratt & Aldridge, 2016). First employed by Christin (2013) crawler-based research has revealed many aspects of cryptomarkets, including: their overall size, composition and regional concentration (Munksgaard, Demant, & Branwen, 2016; Dolliver 2015; Dolliver & Kuhns 2016; Soska & Christin 2015; Christin, 2013); the characteristics of online drug vendors, including variations between actors located across different cryptomarkets (Dolliver & Kenney, 2016) and their propensity to sell drugs internationally (Décary-Hétu et al., 2016); the extent to which cryptomarkets involve large quantity selling indicative of a wholesale supply function (Demant et al., 2016; Aldridge & Décary-Hétu, 2016); as well as region-specific analysis of Canadian cryptomarket activity (Broséus et al., 2016), a focus on Dutch cryptomarket activity (Kruithof et al., 2016) and broader country specific differences in substance availability (Van Buskirk, Naicker, Roxburgh, Bruno, & Burns, 2016).

Where product listing prices from digital trace methodologies have been used in previous cryptomarket research, it has predominantly been to attempt to get a measure of the revenues made by markets or vendors (Christin, 2013; Soska & Christin, 2015; Aldridge & Décary-Hétu, 2016) and in connection to the prices paid by customers. To date, just one paper has deployed digital trace methods to compare cryptomarket drug prices. Van Buskirk, Roxburgh, Bruno, and Burns (2013) calculated and