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Drug trafficking on cryptomarkets and the role of organized crime groups

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ABSTRACT

The shadows of a drug paddler may soon be invisible on the street corner as they have moved to online drug marketplaces called 'cryptomarkets'. The criminogenic attributes of drug trafficking on cryptomarkets have attracted organized crime groups (OCGs) to make use of technology to further its illicit goals. The OCGs making use of cryptocurrencies help in retaining anonymity to an extent, and makes easier for them to launder their proceeds. There is a dearth of literature explaining the increase in drug trafficking on cryptomarkets by OCGs. In a first attempt of its kind, this paper aims at studying the drug trafficking by OCGs on cryptomarkets and explaining the said conundrum by applying Rational Choice Theory (RCT). It is argued that OCGs make a rational choice of dealing drugs online as the benefits attached to drug trafficking on cryptomarkets outweigh the potential costs, such as getting arrested. Through a qualitative analysis of data and online sources, it is revealed that the participants on cryptomarkets have loose hierarchies and have mostly opportunistic connections. The voluminous sales are made by a handful of entrepreneurs who have OCGs like structures, who operate in smaller groups to minimize the risks. RCT best explains the shift of OCGs to cryptomarkets which is only due to cost – benefit analysis.

Introduction

The advent of the internet has brought with itself new opportunities and challenges. Criminals, including organized crime groups (OCGs), have also made use of the internet either for communication or using the internet for committing new types of crimes. The use of the internet by OCGs revolves around two issues: First, the use of the internet only as a medium to commit traditional organized crime. Street gangs dealing drugs over the internet is an example of the internet only being used as a medium for the perpetration of traditional drug dealing. Second, the use of the internet to commit new crimes (Berry, 2018). For instance, hacking bank accounts through the internet to fraudulently transfer money from the bank account. In this example, hacking for the purpose of bank fraud is a new crime which is only possible through the internet (Tropina, 2012).

The internet has broadly two facets. One is the "clear web", which allows surfing mainstream websites such as social media, bank websites, e-commerce websites, etc. Another is the "dark web" or "dark net", which can be accessed by specialized browsers such as The Onion Router (TOR). TOR overlays the internet traffic through world-wide network which leads to anonymous communication (Aldridge and Décary-Hétu, 2014). Since 2011, there has been a rise of "dark web" based online marketplaces for illegally selling weapons, drugs, counterfeit pharmaceuticals, etc. Transactions on such online marketplaces can only be made by "cryptocurrencies" such as Bitcoin, Monero, etc., and therefore, such markets are referred to as "cryptomarkets" (Décary-Hétu et al., 2016).

Organized crime is understood as commission of serious offences by a group of individuals acting in conspiracy with each, for the purpose of financial or monetary benefit. Traditional OCGs are known to have complex structures having fixed hierarchies and specific tasks assigned to each member (Lampe, 2019). These groups have traditionally enjoyed patronage from local politicians and thrive on corrupt practices to evade any issues with the law enforcement agencies (Greco and Greco, 2020). OCGs often operate in a secretive and decentralized manner, with separate crews or cells carrying out specific criminal activities. Due to compartmentalisation of responsibilities, the activities of the group remain secret (Caparini, 2019). This structure helps to insulate the group from law enforcement and reduce the risk of infiltration or betrayal (Leukfeldt et al., 2017). With a view to have a homogenous understanding of organized crime among member countries, United Nations Convention against Transnational Organized Crime was promulgated. The said convention defines OCG as a "structured group of three or more persons acting in concert with each other to commit

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crimes in order to achieve financial gain, directly or indirectly" (United Nations Secretariat, 2005).

Cryptocurrencies are digital assets that use cryptographic techniques to secure and verify transactions and to control the creation of new units. They typically operate on decentralized systems called blockchains, which allow for secure and transparent transactions without the need for a central authority like a bank (European Parliament, 2023). When someone sends or receives cryptocurrency, the transaction is recorded on the blockchain, which is essentially a public ledger that is shared and maintained by many computers around the world (Al-Tawil, 2022). Transactions are verified and processed by a network of users called "miners", who are rewarded with new units of the cryptocurrency for their efforts. Cryptocurrencies are often used as a medium of exchange, similar to traditional currencies like dollars or euros (European Council, 2022).

Evolving nature of organized crime has embraced technology to further its illicit goals (Berry, 2018). Similarly, illegal drug markets are constantly changing, and the participants need to adapt to the changing needs of the consumers. (Paquet-Clouston et al., 2018). A confluence of the above two changing phenomena gave birth to OCGs accessing cryptomarkets for the illicit trade of drugs (Greco and Greco, 2020). The first cryptomarket "Silk Road" was launched in 2011. Silk Road was largely used for the illicit drug trafficking (Aldridge and Décary-Hétu, 2014). After its successful run for almost 2 years, Silk Road was brought down by FBI, and its founder was sent to Jail. An amount of $28.5 Million were seized from Ross Ulbricht, the founder of Silk Road (Pergolizzi et al., 2017).

This article aims at studying the nature and extent of drug trafficking on cryptomarkets by the OCGs. The first part of the article outlines essential features of the cryptomarkets, giving the readers an idea on the attributes of a cryptomarket. In the second part, the article focuses on the role of OCGs on cryptomarkets engrossed in illicit drug trade and theories explaining the said activities of OCGs. Lastly, the author concludes by suggesting policy steps that could be taken to combat illicit drug trade on cryptomarkets.

Features of cryptomarkets

Cryptomarkets have user-friendly homepages that appear just like e-commerce websites such as Amazon and eBay. Each homepage has a title (showing drug name and quantity), product details, images, country of origin, delivery period, seller's information, ratings and feedback. Each vendor also has its own homepage and it contains details such vendors' name, details, products offered for sale, account creation date, rating and comments of vendor by past buyers, etc. (Barrera et al., 2019; Broséus et al., 2016). The essential features of cryptomarkets are outlined below:

Anonymity & security

Cryptomarkets can be accessed through engines such as The Onion Router (TOR), which keeps the location of vendors and buyers hidden (Munksgaard et al., 2016). The location of its users is overlaid through different locations which makes it almost impossible to trace the users. Therefore, TOR is a gateway to such cryptomarkets. On the cryptomarkets, illicit products such as drugs are listed by the vendors just like listings on regular e-commerce sites. There is no requirement of personal contact or interaction either to sell or buy drugs. The buyer's cost of searching for drugs online is negligible (Paquet-Clouston et al., 2018) and the buyers have easy access to user friendly interface. All the transactions take place behind the shield of anonymity (Aldridge and Décary-Hétu, 2014). Anonymity on cryptomarkets reduce the risk of getting caught by the enforcement agencies and risk of violence is zero. While the seller is at no risk of being caught, the buyer is exposed to some risk as the buyers must provide a delivery address.

The cryptomarkets are also equipped with "Pretty Good Privacy" Key (PGP key), which ensures anonymity and encryption of messages being exchanged on the platform. A PGP key allows decryption of message only by the vendor. Therefore, even if the enforcement agencies were to seize the servers hosting the websites, they would not be able to decrypt the messages in absence of the key (Barrera et al., 2019; Broséus et al., 2016).

Distribution

Cryptomarkets provide new ways of drug distribution without changing the conventional supply chains (Morelato et al., 2018). The distribution takes place through postal department or private carriers, who unwillingly, participate in the distribution of drugs (Paquet-Clouston et al., 2018). The vendors on the cryptomarkets employ direct distribution models wherein there is no necessity for wholesalers, brokers, traffickers, street sellers or any intermediaries. The direct distribution model leads to profit maximization and ease of operation on the removal of intermediaries.

Conventional drug dealing business on the streets is territorial in nature. Each gang is confined to a fixed territory in which they sell their product. Any selling in violation of territorial norms attract to violence between gangs. Therefore, in order to smoothly run the business, the vendors limit their dealing to their assigned territories. In contradistinction, cryptomarkets enables the vendors to sell their drugs without any limitations of physical territories. A vendor from anywhere in the world has access to any buyer including distribution of drugs internationally (Aldridge and Décary-Hétu, 2014).

Payments

The anonymity among vendors and buyers bring about trust issues as regards the payment. It is important to safeguard their interests as the delivery of product takes some time to reach the buyer. The vendors prefer cryptocurrencies such as Bitcoin, Ethereum, etc. for receiving payments from the buyers (Bertola, 2020). Cryptocurrencies helps in maintaining secrecy of the transaction and it is difficult to track the origin and delivery of the payment. Illegal transactions may "piggyback" with the legitimate transactions and create a single transaction. Such bundled transactions make it difficult to separate the legitimate transactions with illegitimate transactions. Tracking cryptocurrency transactions requires careful examination and analysis of transactions. For example, a software can be employed to track these transactions analyzing repeated use of "public keys and pair transaction across datasets" (Turner and Irwin, 2018). In addition, the public keys are publicly available and therefore, law enforcement agencies can easily survey and collect transaction data. The transaction data can be retrieved but it is again difficult to associate a particular transaction with a particular person (Reynolds and Irwin, 2017).

Marketplaces such as the defunct Silk Road provided payment through escrow accounts. On payment being made by the buyers, the payment intermediaries hold the funds in an escrow account and when the buyer receives the product, the payment is released to the vendor (Bertola, 2020; UNODC, 2020). Such a system of holding payment in the escrow account has two benefits. Firstly, the banking transaction details are hidden from the vendors and; Secondly, the money is only transferred when the delivery is confirmed by the buyer (Bertola, 2020). Buyers prefer payments through escrow accounts after their bitter experience with the site "Evolution". In 2015, the administrators ran away with huge amounts of bitcoins held in the marketplace (Masson and Bancroft, 2018).

Resale of drugs (B2B selling)

Analysis of listings on the Silk Road by Aldridge & Décary-Hétu shows that could be best characterized as "business to business" listings. The listings showed that bulk drugs were being sold which entailed

high prices (Aldridge and Décary-Hétu, 2014). Only drug dealers sourcing stock could make such purchases. The drug dealers were sourcing stock for their local operations and retail selling on the streets. Listings from countries such as China, The Netherlands, Canada and Belgium have shown that drugs (e.g. Ecstasy, MDMA, etc.) were sold in bulk to generate wholesale revenue (Broséus et al., 2017). The researchers also analysed the terms used in those listings. The terms were uncommon jargons suggesting that the listings were meant to be accessed by other drug dealers (Aldridge and Décary-Hétu, 2014). Such resale of drugs may also take place through social media platform, where it is easy to connect with the buyers (Tiberg and Nordgren, 2022; UNODC, 2020).

Advertisements

All vendors need to advertise their products to attract buyers. However, traditional drug traffickers avoid advertising their product as publicity of their operation may invite unnecessary attention and risks (Kleiman et al., 1991; Reuter, 1983). The vendors on cryptomarket, advertise their products through surrogate advertisements to attract the buyers (Aldridge and Décary-Hétu, 2014). Vendors with high sales aggressively advertise their product by having multiple postings of the same product. Big vendors invest substantial to surpass any competition (Paquet-Clouston et al., 2018). Positive feedback and comments on the cryptomarkets also serve as advertisements for the vendors and help them garner more business (Aldridge and Décary-Hétu, 2014).

Comments, feedback & communities

Cryptomarkets have feedback and comment sections just like Amazon or eBay. The vendors having good reviews and feedback become trusted vendors and the buyers easily trust such vendors while making their purchase (Berry, 2018). Buyers are attracted to vendors who are more experienced and 'experience' is regarded as a sign of reliability and trust. Such an attribute is not built over night and takes a significant amount of time (Soska and Christin, 2015). The buyers opt for established and reputed vendors to avoid transaction failures and safety (Smith and Brynjolfsson, 2001). The ratings of vendors also take a hit due to failed transactions or intercepted deliveries by the police (Décary-Hétu et al., 2016).

Cryptomarkets host chat rooms and active communities where the users share their experience of drug consumption and are actively engaged in discussions on "general discourse on prohibition of drugs", etc. (Maddox et al., 2016). Cryptomarket users have been known to actively participate in such communities as they feel the need to lend support to fellow drug users (Masson and Bancroft, 2018). Reviews from cryptomarket users show that vendors on cryptomarkets are much more professional than the street dealers (Tiberg and Nordgren, 2022).

Entry, sales and exit

The entry for vendors into the online marketplace is easy as they can register on the portal and immediately start selling their product. For example, a vendor enrollment on Alpha Bay would cost $200, which is considered as affordable (Paquet-Clouston et al., 2018). Nonetheless, new vendors have to learn to attract buyers and ship the product without alarming the enforcement agencies (Paquet-Clouston et al., 2018).

In an analysis of entries of Silk Road by Christin, it was found that "within 3 months of market entrance and only 9 % of Silk Road vendors (out of 112 vendors) were present for the entire eight months of study" (Christin, 2013). The same study found that 70 % of the vendors sold less than $1000 worth of drugs, whereas, 2 % of the vendors sold more than drugs worth $100,000 (Christin, 2013). Research by Soska & Christin shows that 1 % top vendors account for more than 51.5 % of all transactions on the darknet (Soska and Christin, 2015)[1](Fig.s 1 and 2).

Most vendors come from western countries such as US, UK, The Netherlands and Canada (Christin, 2013) and cocaine, ecstasy and cannabis have been most popular drugs accounting 70 % of the market share (Soska and Christin, 2015). The majority of cryptomarket users are around 24 years old and 87 % of them were Males (Winstock et al., 2017). Though the statistics show big numbers, the revenue and volume of drug traded on cryptomarkets represents only a minuscule amount of total drug trade (Broséus et al., 2017; EMCDDA, 2022).[2]

Theoretical underpinnings

There are general theories of criminology that explain traditional drug dealing. However, there is no criminological theory explaining the activities of OCGs on Cryptomarkets. An attempt has been made to apply Rational Choice Theory to explain the drug trafficking by OCGs on Cryptomarkets.

Rational choice theory (RCT) of Becker (1968) is a criminological theory that posits that individuals make decisions to engage in a particular criminal behaviour based on a rational weighing of the costs and benefits of that behaviour. According to this theory, individuals are motivated by self-interest and seek to maximize their benefits and minimize their costs (Engeler and Balietti, 2021). In the context of criminal behaviour, RCT suggests that individuals will engage in crime if they believe that the benefits of the crime outweigh the potential costs, including the risk of being caught and punished. RCT assumes that an individual has already formulated a goal and he then weigh the benefits and risks (Broadhurst et al., 2018). The benefits of crime may include financial gain, social status, or other personal rewards, while the costs may include fines, imprisonment, or damage to one's reputation (Broadhurst et al., 2018).

It is argued that RCT best explains the conundrum of drugs trafficking by OCGs on the cryptomarkets. The drug trafficking having moved to the cyberspace has significantly reduced the risk of getting arrested as well as violence at the hands of other OCGs. The OCGs can anonymously access cryptomarkets with a click of button and have no territorial boundaries to limit the distribution of drugs (Engeler and Balietti, 2021). All activities from sourcing and sale of drugs take place from behind a computer screen and the element of physical insecurity is comfortably absent which attracts a rational criminal to operate from behind a curtain of anonymity (Engeler and Balietti, 2021). The superfluous intermediaries have been by-passed to avoid risk and maximise profits (Demant et al., 2018). The payments received are in cryptocurrencies which are difficult to track and easy to launder or convert it to hard cash. Therefore, the ease of doing business has significantly increased and profits are off the charts (Arsovska and Kostakos, 2008). Compared to the traditional drug trafficking, the risks involved in online drug trafficking are significantly reduced. Tracking down the suspects involved in online drug trade and tracing the heads of OCGs becomes significantly difficult in absence of physical evidence establishing links between members of the OCG. Therefore, OCGs make a rational choice of dealing drugs online as the benefits attached to drug trafficking on cryptomarkets outweigh the potential costs.

Arsovska & Kostakos have tried to explain arms trafficking by OCGs in Balkans with the help of RCT (Arsovska and Kostakos, 2008). They postulate that "demand for an illicit good or service, the micro-level objective of achieving financial gain becomes a macro-level organizational goal for a criminal syndicate." RCT can also be used to explain why new members join drug trafficking OCGs. The under lined reasons for new members may be same as those of the core group, but members such a lower ranking members would have a different exposure to risk and benefits compared to the core members. Nonetheless, the fact remains that the benefits outweigh the risks (Demant et al., 2018).

[1] (UNODC, 2020)
[2] (UNODC, 2021)

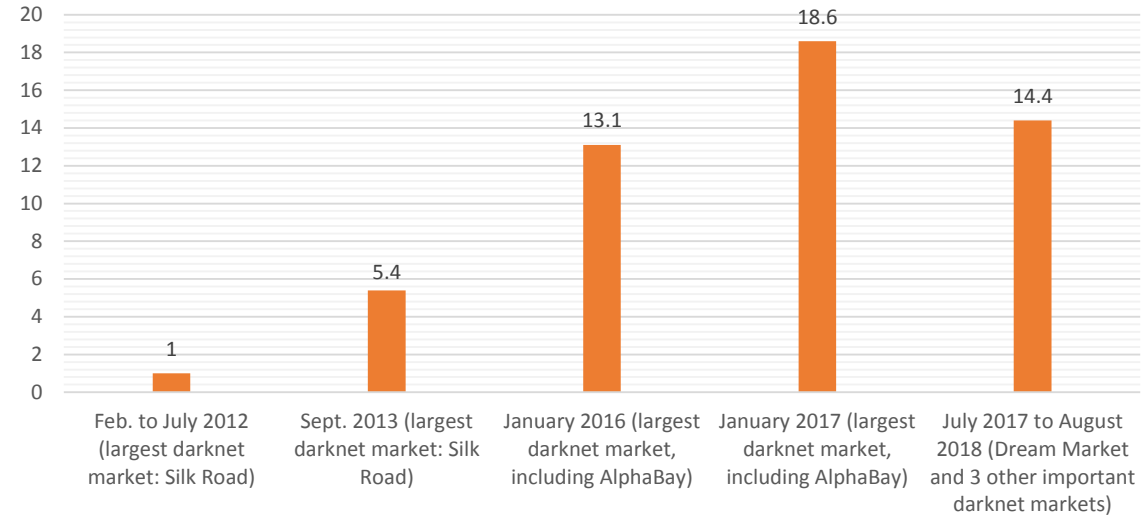

Fig. 1. Estimates of monthly sales of drugs through major darknet markets, 2012–2018 (in Million Euros).
Source: In Focus: Trafficking over the Darknet - World Drug Report 2020.

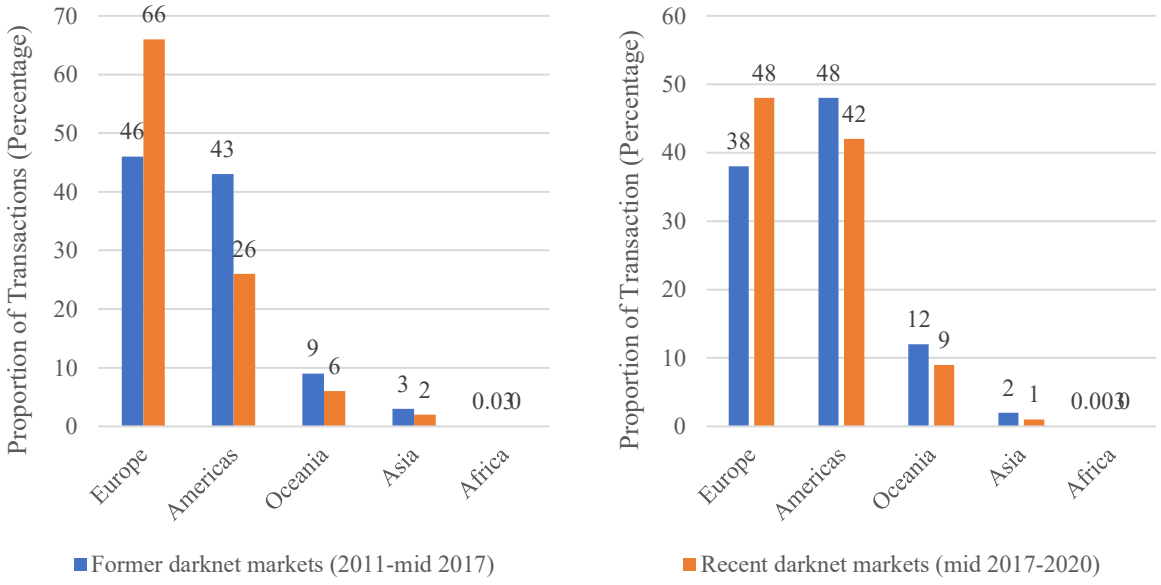

Fig. 2. Origination countries in Drug trade and minimum sales made on 19 cryptomarkets.
Source: World Drug Report 2021.

To reduce drug trafficking on cryptomarkets, it is necessary to increase the perceived costs of engaging in this activity. This can be done through increased law enforcement efforts, such as tracking and seizing the assets of organized crime groups, as well as through education and awareness campaigns that highlight the risks associated with engaging in this type of activity. Additionally, reducing the perceived benefits of drug trafficking on cryptomarkets may involve disrupting the market itself through targeted enforcement actions or regulatory measures.

Drug trafficking by OCGs on cryptomarkets

The traditional OCGs are known to run like big enterprises. As businesses have embraced technological advancements, therefore, the OCGs were "expected" to move towards cyberspace, in order to stay in the market and compete with the competitors (Lavorgna, 2019). The presence of OCGs is well-established in is drug trafficking. Therefore, naturally the OCGs being "opportunistic economic agents", have now moved to cyberspace expanding their business (Lavorgna, 2015).

Group structure of OCGs

The OCGs tend to operate like a business enterprise having fixed hierarchies. The traditional OCGs are significantly different from the OCGs operating in cyberspace. The traditional OCGs have "pyramid-like structures" of hierarchy and are generally ethnically homogenous. Whereas OCGs operating in cyberspace do not have such structure and have loose structures. Such groups are formed by highly skilled individuals (Mezei and Nagy, 2016), and the members have "opportunistic" connections rather than "systematic" connections (Lavorgna, 2019). The "social ties" among the members play a crucial role in recruitment of the members and coordinating their activities. For instance, offline social ties such as from the "same neighborhood" or "known from the under-world" lead to formation of core group of the OCGs operating in cyberspace (Leukfeldt et al., 2017). Other members such as the "Enablers" (who provided necessary services to execute the plan) and "money mules" comprised of the "general composition" of the OCGs, change very often (Leukfeldtet al, 2017). The members operate in fragments though with a clear division of labour (Lavorgna, 2019).

Cyberspace brings together deviants who were otherwise dispersed individuals. Bringing them together leads to "communal spirit" and "social bonding and learning" (Lavorgna and Antonopoulos, 2022). Such bonding can also be improved by awarding titles for its various ranks. For instance, a Russian group operating in cyberspace by the name "Carder Planet" had various ranks such as "Capo" (Captain), clearly showing mafia-type ranks and hierarchies (Lusthaus, 2013).

Given the loose structures, some scholars are sceptical about labelling such structures as OCGs (Lusthaus, 2013). That is majorly due to first, violence is at the center of activities of OCGs. However, there is no "analogous threat" in the context of cyberspace. Second, the OCGs are extremely territorial in nature. Whereas, cyberspace, by its very nature, is without any boundaries (Von Lampe, 2008). Critics state that an easy labelling of online criminal networks as OCGs has major repercussions for national security and the allocation of resources. Therefore, a re-discussion on the features of OCGs is required when such groups are operating in cyberspace (Lavorgna, 2019).

Activities of OCGs on cryptomarkets

OCGs have been quick to adapt to the rise of cryptomarkets, where they engage in a range of illicit activities including drug trafficking, weapon sales, money laundering, and cybercrime. They use the anonymity and decentralized nature of cryptocurrencies to carry out their criminal activities and evade law enforcement.

A Europol Report of 2017 suggests that the majority of vendors dealing in small quantities were lone offenders (Europol, 2017), whereas top sellers having listings of big quantities of drugs were put by OCGs (Aldridge and Décary-Hétu, 2014). Several studies have shown that drug trafficking on cryptomarkets is highly concentrated in the hands of a few entrepreneurs, and the majority of the vendors are mere spectators (Brynjolfsson and Smith, 2000; Clay et al., 2001; Paquet-Clouston et al., 2018). This is because there is a natural inclination to purchase from reputed vendors who publicly advertise their products. The advertisement of products is seen as a sign of "reliability and security". Buyers are willing to pay higher prices for verified and reliable vendors (Paquet-Clouston et al., 2018).

The major cost involved in running an illicit drug business is having several people involved and having coordination among them (Reuter, 1983). By decreasing the number of people involved in the trafficking process, the OCGs have been able to bring down such costs and increase their profits by selling drugs on cryptomarkets. The extra funds can be utilized for advertising campaigns to attract potential customers. In addition to advertisements, the vendors offer "freebies" to attract potential buyers and good feedbacks (Ladegaard, 2018).

The general view of large-scale organizations is that they use several personnel for their operations and muscle to protect their operations. However, studies have shown that drug traffickers prefer to operate in groups having less than 10 people to minimize the risks (Adler, 1993; Bouchard and Morselli, 2014). The risk of getting arrested is much higher for the vendors than the buyers (Bouchard and Tremblay, 2005). The risk of arrest of vendors depends on their proximity to drugs and money and their position in the hierarchy. These smaller groups exist for short durations (Morselli et al., 2007) and some studies show that listings on cryptomarkets remained active for merely a few months (Paquet-Clouston et al., 2018).

There are instances where traditional OCGs diversify and move to cyberspace for better distribution of drugs. Cryptomarket "Cartel de Sinalao" (CDS) is directly associated with Sinaloa cartel and Los Chapitos. This cryptomarket uses the same logo – a red and black skull with the words "Cartel de Sinalao" written below it. In addition to drugs, CDS provides software and malware, hire services, counterfeiting, human trafficking, money laundering and many more services. Such other marketplaces (such as Cartel Gulf Texas, Los Urabenos, Cartel Jalisco Nuevo Generation, etc.) can be seen online resembling direct association with traditional OCGs (Darkowl, 2022).

Lusthaus, 2013 presents an interesting view stating whether the cryptomarkets themselves can be termed as OCGs? The people running such marketplaces have fixed hierarchies, structures and are profit driven. He terms the "administrators" as being in charge of sites and "moderators" are the one who supervises the markets and enforces their rules. Just like any enterprise or traditional OCGs, one moves up the ladder showing "trustworthiness". Cryptomarkets are known to provide escrow services to their users. Such escrow services are offered subject to payment of a small amount of "fixer's fee". This "fixer's fee" can be compared with protection money extorted by the traditional OCGs. Cryptomarket called "DarkMarket" also provided dispute resolution mechanisms mirroring the roles of offline OCGs (Lusthaus, 2013). Despite such a view, a marketplace cannot be an OCG and it is merely a marketplace controlled by OCG.

Laundering proceeds of crime

Money laundering is a key component of OCGs involved in drug trafficking on Cryptomarkets. These groups generate vast amounts of Cryptocurrencies and convert the same to cash, which they must launder in order to make it appear as though it was earned through legitimate means. This is typically done through a complex web of financial transactions that involve moving money through multiple accounts and jurisdictions, making it difficult to trace the origin of the funds. Money laundering allows OCGs to continue their illegal activities and to hide the profits they generate from drug trafficking (Gilmour, 2022).

The cryptocurrencies received in payments on the cryptomarkets are sometimes retained as investments by the OCGs. These investments in cryptocurrencies are used to fund other online and offline illegal activities (Greco and Greco, 2020). The cryptocurrencies which are not retained as investments are laundered and infused in legitimate economy. The Netherlands law enforcement have found that moderator of a cryptomarket used his contacts to exchange bitcoins for physical cash (Kruisbergen et al., 2019). The cash so obtained cane be laundered in three phases: placement of money in the economy (placement), concealing the origin of the money (layering) and reintroduction of money into the money (integration) (Europol, 2017). Recently in April 2023, a gang leader of Indian origin was awarded eight years and ten months' prison for his role in drug trafficking through online "handles" on EncroChat. He also plead guilty to money laundering charges before a Guilford Crown Court, United Kingdom (PTI, 2023).

The OCGs operating on the dark web are efficient in laundering cryptocurrencies can swiftly be moved between two accounts and are difficult to track. The OCGs retain "professional enablers" such as lawyers, accountants, bankers and others in finance industry to cloak their ill-gotten money (Gilmour, 2022). The recent scandals of Panama Papers and Pandora Papers have thrown light on involvement of "Professional enablers" in off shore money laundering.

Shipment of drugs by OCGs

The drugs are being sold online, however, the major activities such as manufacture, storage and distribution take place offline (Paquet-Clouston et al., 2018). For the sake of distribution, the local post office can be corrupted and paid off as and when an alarm is raised (Berry, 2018). Shipping internationally exponentially increases the risk of detection as the product moves through x-rays, scanners, etc., by the customs authorities (Volery, 2015). In a study by Munksgaard and others showed that as of May 2015, 62 % of the market vendors were arrested in connection with transborder shipments (Munksgaard et al., 2016).

In the United Kingdom, Tyneside based OCG were involved in transborder shipments to US, Australia and New Zealand during the pandemic period. Two of its high-ranking members – Daniel Daymond and Robbie Arnold nicknamed "postmen" were involved in storage and

distribution of drugs through darknet. The two individuals were arrested by the National Crime Agency for their roles for selling drugs on cryptomarkets and convicted (Kennedy, 2023). Australian authorities have been successful in intercepting packages suspected to contain drugs based on their packaging, labelling, stickers and finger marks. Such packages helped in identifying the OCGs responsible for sending such packages (Broséus et al., 2017).

The coronavirus pandemic accelerated the drug addiction in the United States. The Center for Disease Control and Prevention in its preliminary report stated that the drug overdose was at an all-time high during pandemic related lockdowns. They reported that 100,000 cases of drug overdoses were found during the period March 2020 to March 2021. The Joint Criminal Opioid and Darknet Enforcement (JCODE) team is examining the online marketplaces that enable door step delivery of drugs. JCODE runs annual campaigns against drug trafficking through cryptomarkets. The year 2021′s campaign was called “Dark HunTor” that led to crackdown on OCGs in cyberspace and has led to seizure of $31.5 Million dollars in Cash and cryptocurrencies. Approximately 234 Kilograms of drugs has been seized and 150 arrests have been made world-wide (Federal Bureau of Investigation, 2021).

The volume of sales on the cryptomarkets is just a miniscule amount of the total drug trade world over. However, easy access to drugs leads to consumption of drugs with increased frequency (Pergolizzi et al., 2017). Therefore, there is a need to curb the illicit trade of drugs online before it becomes an overblown problem.

Tackling activities of OCGs on cryptomarkets

Tackling cryptomarkets is a complex and challenging task that requires a coordinated effort from multiple stakeholders. By combining law enforcement efforts, regulatory measures, public education campaigns, and international cooperation, it may be possible to reduce the harms associated with drug trafficking and other illicit activities on these platforms.

Law enforcement agencies should focus on developing new strategies for investigating and prosecuting crimes related to cryptomarkets. This may involve the use of advanced technologies, such as blockchain analysis tools, to track and seize assets associated with illicit activities on these platforms. The transactions by cryptocurrencies take place using public keys which are publicly recorded. By virtues of these keys being publicly available and pattern of transactions, the law enforcement can track the origin and delivery of the transaction (Frick, 2019). The law enforcement agencies may be able to track the transaction but they may not be able to the identify the user as registering data such as email address can easily be falsified. The law enforcement may publish the “dirty” public keys on different online forums and may be able to subpoena those records (Reynolds and Irwin, 2017). To tackle laundering of cryptocurrencies, “blacklisting” has been proposed as a new technique for flagging those cryptocurrencies that have been used for illegal transactions. Such flagged “tainted” coins can be refused by the receivers. There is literature on “blacklisting” as a potential anti-money laundering measure, blacklisting of cryptocurrencies would require a high degree of inter-country and inter-departmental cooperation (Kolachala et al., 2021).

European Council has instructed member nations to include cryptocurrencies within the purview of Anti-Money laundering laws. Additionally, the crypto-asset service providers have been directed to comply with enhanced checks in line with Anti-Money laundering laws (European Council, 2022). The European Regulation no. 2023/1114 adopted in May, 2023 advises increased checks on crypto-transfers from countries which are flagged as high-risk countries. This regulations also mandates strict compliance of Know Your Customer (KYC) rules for crypto-transactions and non-compliance thereof shall entail stringent measures (European Parliament, 2023). The absence of borders in the realm of digital currency and exchanges renders current laws and regulations insufficient in combating cross-border money laundering activities. Consequently, it is crucial to promptly establish unified global regulations to address this issue effectively. The pursuit of harmonization becomes paramount as the FATF endeavors to create a universal standard (Al-Tawil, 2022).

Drug trafficking on the cryptomarkets provide a novel method of retail distribution of drugs, keeping the regular modes of distribution intact. Though the drugs are being sold online, however, the major activities such as manufacture, storage and distribution takes place offline (Paquet-Clouston et al., 2018). Therefore, the enforcement agencies are required to be armed with necessary equipment and personnel required to be combat drug trafficking on cryptomarkets by monitoring afore stated physical activities.

Tackling cryptomarkets requires international cooperation between law enforcement agencies and regulatory bodies. This may involve sharing intelligence and expertise to track and disrupt organized crime networks operating on these platforms. In the borderless cyberspace, international cooperation is the key to tackle drug trafficking on cryptomarkets (UNODC, 2020). An important aspect that requires consideration is formulation of homogenous legislations for tackling operations of drug traffickers on the cryptomarkets. For instance, Paris Pact signed between 53 countries for international cooperation to combat distribution of opioids originating from Afghanistan can be extended to cryptomarkets.

Inter-departmental cooperation and collaboration of enforcement agencies shall be key in unearthing the operations of drug traffickers on cryptomarkets (Lavorgna, 2015; Tropina, 2012). For instance, police and postal department may collaborate to monitor the packaging methods, labelling, stickers, etc. to trace the trafficking routes and ultimately track down the vendors (Morelato et al., 2018). Australian enforcement agencies have had a good amount of success in tracking the OCGs based on the packaging of those products.

Governments and regulatory bodies should consider implementing new regulations and guidelines to reduce the potential for illicit activities on cryptomarkets. This may include measures to increase transparency and accountability for platform operators and users, as well as restrictions on the use of cryptocurrencies for illegal purposes. In absence of the homogenous legislations, the enforcement agencies may end up categorizing such activities under the Cybercrime Law or the Anti-drugs law and not under Anti-Organized crime Law, which would led to difficulty in enforcement (Leukfeldt et al., 2017). As the use of cryptocurrencies and cryptomarkets continues to evolve, there is a growing need for amendment of existing laws and additional powers for law enforcement agencies to tackle the associated risks and challenges. This may include regulations to increase transparency and accountability for platform operators and users, as well as restrictions on the use of cryptocurrencies for illegal purposes. In addition, law enforcement agencies may require additional powers to access information and data related to cryptomarkets and investigate and prosecute crimes related to these platforms. However, any new laws and powers must balance the need for security and regulation with the potential impacts on privacy and civil liberties.

Conclusion

The use of dark web-based cryptomarkets has provided new avenues to the OCGs for drug trafficking. There is no denying that the cryptomarkets are smaller in size when compared to the total global drug trade. For instance, Silk Road’s earnings were estimated in the tens of millions of dollars, while the international drug trade’s value is measured in hundreds of billions of dollars. The significance of the scalability and exponential growth of cryptomarkets does not lie in the revenue they have produced, but rather in the potential influence they could have on the future of drug transactions (Bertola, 2020).

The OCGs on the cryptomarkets have “fluid structures” and individuals come together for “opportunistic gains” rather than sharing a common ideology. There is no violence involved in the activities of

OCGs operating in the cyberspace (Lavorgna, 2019). Absence of such essential features of traditional OCGs have raised doubts on labelling such criminal networks as OCGs (Lusthaus, 2013). Nonetheless, there is evidence to show that the OCGs are forming smaller groups to sell drugs on cryptomarkets. Though the groups are smaller, but they are known to have sell their product in bigger quantities and that too internationally.

The crackdown of cryptomarkets leads to newer proxy sites or the vendors themselves start their online portal for the illegal drug trade (Soska and Christin, 2015). Even after police crackdown on Silk Road, there was merely slow-down in the trade for a month, before the other cryptomarkets absorbed the vendors and buyers. Therefore, the crackdowns of cryptomarkets deters the participants only for a very limited time (Décary-Hétu and Giommoni, 2017). Studies have shown that large vendors are backed by OCGs and have the most sales volumes and make the most amount of money. Therefore, the interventions on the cryptomarkets should be aimed at crackdown on large vendors rather than the administrators of cryptomarkets. Busting large vendors shall bring down the marketplace in its entirety (Broséus et al., 2016; Paquet-Clouston et al., 2018).

The benefits attached to the cryptomarkets will have to be eliminated so as to make these markets less attractive for OCGs for their activities. The 'rational choice' will have to be tilted in favor of more potential risks than the benefits and this can only be achieved through multifaceted approach that includes measures such as efficient law enforcement, international and inter-department cooperation and regulatory interventions (Engeler and Balietti, 2021).

The drug trafficking on cryptomarkets is a newer phenomenon and there is dearth of empirical evidence to suggest that the OCGs are shifting to online criminal networks (Lavorgna, 2019). The evidence is scarce either because scholars repel the very idea of labeling loosely formed criminal networks as OCGs (Lusthaus, 2013) or there less number of studies evaluating the role of OCGs on Cryptomarkets. There is also handsome scope for empirical testing of applicability of RCT to explain the role of OCGs on cryptomarkets. Therefore, there huge scope of further research in this area, focusing the role of OCGs on cryptomarkets.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Adler, P.A., 1993. Wheeling and dealing: An ethnography of an upper-level drug dealing and smuggling community. Columbia University Press.

Aldridge, J., Décary-Hétu, D. (2014). Not an 'Ebay for Drugs': the Cryptomarket 'Silk Road' as a paradigm shifting criminal innovation. *Available at SSRN 2436643*. doi:https://doi.org/10.2139/ssrn.2436643.

Al-Tawil, T.N.E., 2022. Anti-money laundering regulation of cryptocurrency: UAE and global approaches. J. Money Laund. Control.

Arsovska, J., Kostakos, P.A., 2008. Illicit arms trafficking and the limits of rational choice theory: the case of the Balkans. Trends Organ. Crime 11, 352–378. https://doi.org/10.1007/s12117-008-9052-y

Barrera, V., Malm, A., Décary-Hétu, D., Munksgaard, R., 2019. Size and scope of the tobacco trade on the darkweb. Glob. Crime. 20 (1), 26–44. https://doi.org/10.1080/17440572.2019.1569520

Berry, M., 2018. Technology and organised crime in the smart city: an ethnographic study of the illicit drug trade. City, Territ. Archit. 5 (1), 1–11. https://doi.org/10.1186/s40410-018-0091-7

Bertola, F., 2020. Drug trafficking on darkmarkets: how cryptomarkets are changing drug global trade and the role of organized crime. Am. J. Qual. Res. 4 (2), 27–34. https://doi.org/10.29333/ajqr/8243

Bouchard, M., Morselli, C., 2014. Opportunistic structures of organized crime. Oxf. Handb. Organ. Crime. 1, 288–302. https://doi.org/10.1093/oxfordhb/9780199730445.013.015

Bouchard, M., Tremblay, P., 2005. Risks of arrest across drug markets: a capture-recapture analysis of "hidden" dealer and user populations. J. Drug Issues 35 (4), 733–754. https://doi.org/10.1177/002204260503500404

Broadhurst, R., Lord, D., Maxim, D., Woodford-Smith, H., Johnston, C., Chung, H.W.,. Sabol, B. (2018). Malware trends on 'darknet'crypto-markets: Research review. Available at SSRN 3226758.

Broséus, J., Rhumorbarbe, D., Mireault, C., Ouellette, V., Crispino, F., Décary-Hétu, D., 2016. Studying illicit drug trafficking on Darknet markets: structure and organisation from a Canadian perspective. Forensic Sci. Int. 264, 7–14. https://doi.org/10.1016/j.forsciint.2016.02.045

Broséus, J., Morelato, M., Tahtouh, M., Roux, C., 2017. Forensic drug intelligence and the rise of cryptomarkets. Part I: studying the Australian virtual market. Forensic Sci. Int. 279, 288–301. https://doi.org/10.1016/j.forsciint.2017.08.026

Brynjolfsson, E., Smith, M.D., 2000. Frictionless commerce? A comparison of Internet and conventional retailers. Manag. Sci. 46 (4), 563–585. https://doi.org/10.1287/mnsc.46.4.563.12061

Caparini, M. (2019). *UN Police and the challenges of organised crimec.* Retrieved from ⟨http://www.jstor.org/stable/resrep24450⟩.

Christin, N. (2013). *Traveling the Silk Road: A measurement analysis of a large anonymous online marketplace*. Paper presented at the Proceedings of the 22nd international conference on World Wide Web.

Clay, K., Krishnan, R., Wolff, E., 2001. Prices and price dispersion on the web: evidence from the online book industry. J. Ind. Econ. 49 (4), 521–539. https://doi.org/10.1111/1467-6451.00161

Darkowl. (2022). Darknet Cartel Associated Marketplaces. Retrieved from ⟨https://www.darkowl.com/blog-content/darknet-cartel-associated-marketplaces/⟩.

Décary-Hétu, D., Giommoni, L., 2017. Do police crackdowns disrupt drug cryptomarkets? A longitudinal analysis of the effects of Operation Onymous. Crime Law Soc. Change 67, 55–75. https://doi.org/10.1007/s10611-016-9644-4

Décary-Hétu, D., Paquet-Clouston, M., Aldridge, J., 2016. Going international? Risk taking by cryptomarket drug vendors. Int. J. Drug Policy 35, 69–76. https://doi.org/10.1016/j.drugpo.2016.06.003

Demant, J., Munksgaard, R., Décary-Hétu, D., Aldridge, J., 2018. Going local on a global platform: a critical analysis of the transformative potential of cryptomarkets for organized illicit drug crime. Int. Crim. Justice Rev. 28 (3), 255–274. https://doi.org/10.1177/1057567718769719

EMCDDA, 2022. European drug report 2022: Trends and Developments. Publications Office of the European Union.

Engeler, S.M., Balietti, S. (2021). Cryptocurrencies, Rational Choice, and Organized Crime. In.

European Council. (2022). Digital finance: agreement reached on European crypto-assets regulation (MiCA) [Press release]. Retrieved from ⟨https://www.consilium.europa.eu/en/press/press-releases/2022/06/30/digital-finance-agreement-reached-on-european-crypto-assets-regulation-mica/⟩.

Europol, 2017. Massive blow to criminal dark web activities after globally coordinated operation. Europol.

Federal Bureau of Investigation. (2021). With Overdose Deaths at a Historic High, FBI and Partners Target Online Drug Markets Retrieved from ⟨https://www.fbi.gov/news/stories/fbi-and-partners-target-online-drug-markets-102621⟩.

Frick, T.A. (2019). Virtual and cryptocurrencies—regulatory and anti-money laundering approaches in the European Union and in Switzerland. Paper presented at the Era Forum.

Gilmour, P.M., 2022. Reexamining the anti-money-laundering framework: a legal critique and new approach to combating money laundering. J. Financ. Crime. https://doi.org/10.1108/jfc-02-2022-0041

Greco, F., Greco, G., 2020. Organised crime: underground economy and regulations to combat cybercrime. Eur. J. Political Sci. Stud. 4 (1). https://doi.org/10.46827/ejpss.v4i1.935

Kennedy, R., 2023. Tyneside organised crime group members supplied drugs around the world on dark web. Chronicle Live (Retrieved from). ⟨https://www.chronicleliive.co.uk/news/north-east-news/tyneside-organised-crime-group-members-26370410⟩.

Kleiman, M., Caulkins, J.P., Young, R.M., 1991. Modelling drug markets: Program in Criminal Justice Policy and Management. In: Kennedy, John F. (Ed.), School of Government. Harvard University.

Kolachala, K., Simsek, E., Ababneh, M., Vishwanathan, R. (2021). *SoK: money laundering in cryptocurrencies.* Paper presented at the Proceedings of the 16th International Conference on Availability, Reliability and Security.

Kruisbergen, E.W., Leukfeldt, E.R., Kleemans, E.R., Roks, R.A., 2019. Money talks money laundering choices of organized crime offenders in a digital age. J. Crime. Justice 42 (5), 569–581. https://doi.org/10.1080/0735648x.2019.1692420

Ladegaard, I., 2018. Instantly hooked? freebies and samples of opioids, cannabis, MDMA, and other drugs in an illicit E-commerce market. J. Drug Issues 48 (2). https://doi.org/10.1177/0022042617746975

Lampe, K.V. (2019). Definitions of Organized Crime. Retrieved from ⟨http://www.organized-crime.de/organizedcrimedefinitions.htm⟩.

Lavorgna, A., 2015. Organised crime goes online: realities and challenges. J. Money Laund. Control 153–168. https://doi.org/10.1108/jmlc-10-2014-0035

Lavorgna, A., 2019. Cyber-organised crime. A case of moral panic? Trends Organ. Crime. 22 (4), 357–374. https://doi.org/10.1007/s12117-018-9342-y

Lavorgna, A., Antonopoulos, G.A., 2022. Criminal markets and networks in Cyberspace. Trends Organ. Crime. https://doi.org/10.1007/s12117-022-09450-5

Leukfeldt, E.R., Lavorgna, A., Kleemans, E.R., 2017. Organised cybercrime or cybercrime that is organised? An assessment of the conceptualisation of financial cybercrime as organised crime. Eur. J. Crim. Policy Res. 23 (3), 287–300. https://doi.org/10.1007/s10610-016-9332-z

Leukfeldt, E.R., Kleemans, E.R., Stol, W.P., 2017. A typology of cybercriminal networks: from low-tech all-rounders to high-tech specialists. Crime Law Soc. Change 67 (1), 21–37. https://doi.org/10.1007/s10611-016-9662-2

Lusthaus, J., 2013. How organised is organised cybercrime? Glob. Crime. 14 (1), 52–60. https://doi.org/10.1080/17440572.2012.759508

Maddox, A., Barratt, M.J., Allen, M., Lenton, S., 2016. Constructive activism in the dark web: cryptomarkets and illicit drugs in the digital 'demimonde'. Inf. Commun. Soc. 19 (1), 111–126. https://doi.org/10.1080/1369118x.2015.1093531

Masson, K., Bancroft, A., 2018. 'Nice people doing shady things': drugs and the morality of exchange in the darknet cryptomarkets. Int. J. Drug Policy 58, 78–84. https://doi.org/10.1016/j.drugpo.2018.05.008

Mezei, K., Nagy, Z., 2016. Organised cybercrime groups and their illicit online activities. Studia Iuridica Auctoritate Universitatis Pecs Publicata 154, 143.

Morelato, M., Broséus, J., De Grazia, A., Tahtouh, M., Esseiva, P., Roux, C., 2018. Forensic drug intelligence and the rise of cryptomarkets. Part II: combination of data from the physical and virtual markets. Forensic Sci. Int. 288, 201–210. https://doi.org/10.1016/j.forsciint.2018.05.002

Morselli, C., Giguère, C., Petit, K., 2007. The efficiency/security trade-off in criminal networks. Soc. Netw. 29 (1), 143–153. https://doi.org/10.1016/j.socnet.2006.05.001

Munksgaard, R., Demant, J., Branwen, G., 2016. A replication and methodological critique of the study "Evaluating drug trafficking on the Tor Network". Int. J. Drug Policy 35, 92–96. https://doi.org/10.1016/j.drugpo.2016.02.027

Paquet-Clouston, M., Décary-Hétu, D., Morselli, C., 2018. Assessing market competition and vendors' size and scope on AlphaBay. Int. J. Drug Policy 54, 87–98. https://doi.org/10.1016/j.drugpo.2018.01.003

Pergolizzi Jr, J., LeQuang, J., Taylor Jr, R., Raffa, R., 2017. The "Darknet": the new street for street drugs. J. Clin. Pharm. Ther. 42 (6), 790–792. https://doi.org/10.1111/jcpt.12628

PTI. (2023, 30 April 2023). Indian-origin man in UK jailed for drug smuggling, money laundering. India Today. Retrieved from https://www.indiatoday.in/world/story/indian-origin-man-uk-money-laundering-drug-smuggling-jailed-2366455-2023-04-30.

Regulation (EU) 2023/1114 of the European Parliament and of the Council pf 31 May 2023, (2023).

Reuter, P., 1983. Disorganized crime: The economics of the visible hand. MIT Press, Cambridge, MA.

Reynolds, P., Irwin, A.S., 2017. Tracking digital footprints: anonymity within the bitcoin system. J. Money Laund. Control 20 (2), 172–189. https://doi.org/10.1108/jmlc-07-2016-0027

Smith, M.D., Brynjolfsson, E., 2001. Consumer decision-making at an Internet shopbot: Brand still matters. J. Ind. Econ. 49 (4), 541–558. https://doi.org/10.1111/1467-6451.00162

Soska, K., Christin, N. (2015). *Measuring the longitudinal evolution of the online anonymous marketplace ecosystem.* Paper presented at the 24th USENIX security symposium (USENIX security 15).

Tiberg, F., Nordgren, J., 2022. Ordinary people, criminals, addicts and recreational users: Swedish court of law descriptions of persons sentenced for online drug purchases. Nord. Stud. Alcohol Drugs. https://doi.org/10.1177/14550725221079524

Tropina, T. (2012). The Evolving Structure of Online Criminality: How Cybercrime Is Getting Organised. eucrim - The European Criminal Law Associations' Forum. doi:10.30709/eucrim-2012-022.

Turner, A., Irwin, A.S.M., 2018. Bitcoin transactions: a digital discovery of illicit activity on the blockchain. J. Financ. Crime. 25 (1), 109–130. https://doi.org/10.1108/jfc-12-2016-0078

United Nations Convention Against Transnational Organized Crime and the Protocols Thereto, (2005).

UNODC. (2020). *In Focus: Trafficking over the Darknet - World Drug Report 2020*. United Nations publication, Sales No. E. 20. XI. 6.

UNODC. (2021). *World Drug Report 2021. Global Overview: Drug Demand Drug Supply*. Retrieved from.

Volery, R. (2015). Drug dealing on cryptomarkets: Shipping techniques and knowledge transform [ORIGINAL TITLE IN FRENCH: Vente de drogues sur les cryptomarchés: Techniques d'envoi et transmission des connaissances] Masters at Ecole des sciences criminelles. *Université de Lausanne*.

Von Lampe, K., 2008. Organized crime in Europe: conceptions and realities. Polic.: A J. Policy Pract. 2 (1), 7–17. https://doi.org/10.1093/police/pan015

Winstock, A., Barratt, M., Ferris, J., Maier, L. (2017). Global drug survey. *GDS Core Research Team*.