

Organised cybercrime or cybercrime that is organised? An assessment of the conceptualisation of financial cybercrime as organised crime

Abstract

Criminological research over the last couple of decades has improved our understanding of cybercrimes. However, this body of research is regarded as still theoretically thin and not fully developed; more knowledge on the actors involved, their characteristics, and modus operandi is needed. Some publications have recently suggested that organised crime is or might be involved in cybercrimes, which would have important policing implications, but evidence-based research on this point is still scarce and inconclusive. This article seeks to further this path of inquiry by providing a systematic analysis of 40 cases from the Netherlands, Germany, UK, and US where criminal networks were involved in financial cybercrimes affecting the banking sector, assessing whether and to what extent these criminal networks meet the definitions of organised crime, and discussing the theoretical and policing implications of our findings.

Introduction

With the Internet becoming embedded in countless aspects, routines, and practices of nowadays way of living, connectivity is now an established feature of our society (Hassan 2008). The same features that have consolidated the success of the Internet, however, are also criminogenic, and have led to new offences that are enabled or enhanced by technologies – so-called cybercrimes (Choo et al. 2007; Wall 2007). Criminological research over the last couple of decades has improved our understanding of cybercrimes, with a substantial number of studies expanding our knowledge on both offending and victimisation (for a recent review of the literature, see Holt and Bossler 2014). However, this body of research is regarded as still theoretically thin and not fully developed (Lagazio et al. 2014).

One major problem is that the concept of cybercrime is complex, and it encompasses an extremely broad range of different crimes; some can be assessed through an economic perspective, while others are motivated by ideology, passion, and even revenge. For analytical precision and to limit potential research bias, as different types of offenders are likely to be involved in different types of cybercrimes, in this study we focus only on profit-driven

cybercrimes affecting the banking and financial sector, and specifically phishing and malware attacks¹. These types of crimes have become increasingly problematic over the last fifteen years, with the advent of online banking and the proliferation of electronic funds transfer systems (Smith 2010: 223ff). It is difficult to assess their impact, and both financial costs and intangible losses (such as the reduction of customers' trust) can be acknowledged (Wall 2008; Lagazio et al. 2014); the estimates are impressive, with a cost of almost £2.5bn in the UK alone (Cabinet Office and Detica 2011), even if it has to be stressed that these estimates have been criticised because of their scarce reliability (Kshetri 2010).

In order to better counter these types of criminal activities, more knowledge on the actors involved, their characteristics, and modus operandi is needed. Some publications suggested that organised crime (hereafter, OC) is or might be involved in financial cybercrimes (to name a few, Williams 2001; Birk et al. 2007; Grabosky 2015), which would have important policing implications, but evidence-based research on this point is still scarce and inconclusive. When it comes to criminal networks active in cyberspace, in fact, some researchers are increasingly adopting the OC narrative to describe a broad range of offenders (for instance, Choo and Smith 2007; McGuire 2012). Others, on the other hand, are more cautious in expanding the usage of OC in the absence of further understanding of the characteristics of these criminal networks, as OC is not an aseptic notion but has a strong evocative power (Lusthaus 2013; Lavorgna 2016). This article seeks to further this path of inquiry, and contributes to this debate by presenting empirical research. Section “Cyber OC: success and criticism of a concept” provides a focused literature review on the presence of OC groups in cyberspace; Section “Data gathering and analysis” describes the data and the methods used in this study. Sections “Empirical results” and “Discussion” focus on the composition and structure of the cyber-criminal networks analysed, their social relationships, use of violence and corruption and connections with the legal economy, and assess to what extent they meet the current definitions of OC. Finally, Section “Implications and conclusion” discusses the theoretical and policing consequences of our findings and suggests topics for further research.

Cyber OC: success and criticism of a concept

¹ *Phishing* can be defined as “a scalable act of deception whereby impersonation is used to obtain information from a target using digital means such as email” (Lastdrager 2014), while *malware* (malicious software) are programs used to compromise computer systems and steal information.

A growing number of academic studies and reports from cybersecurity companies show that varieties of organisational structures are involved in cybercrimes, and have expanded the notion of OC to cover profit-driven criminal phenomena occurring completely or partially in cyberspace (Williams 2001; Choo and Smith 2007; Grabosky 2007; Broadhurst et al. 2014). Regarding specifically financial cybercrimes, Birk et al. (2007) referred to organised cybercrime in cases of identity theft through phishing, but organisational structures are not analysed in their study. More recently, Hutchings' study on computer crimes compromising data and financial security (Hutchings 2014) suggested that many cyber-offenders are highly networked, cooperate with each other to commit offences, and learn their behaviour from others. The results, however, are not conclusive in indicating whether we should label these groups operating online as OC. A widely quoted report is that from BAE Systems Applied Intelligence on the use of ICTs by organised criminals (McGuire 2012). The report identified three main types (type I, II, and III) and six sub-types (swarm, hubs, extended hybrids, clustered hybrids, aggregates, and hierarchies) of cyber OC groups and concluded that up to 80 percent of cybercrime is OC. According to the report, certain key characteristics of traditional OC groups need to be reconsidered when groups are operating online: for instance, in cyberspace the size of a group does not correlate with the impact and scope of offending and many associations are highly transitory. The interpretation offered in the report is that cyberspace *augmented*, rather than replaced, existing varieties of organised criminal organisations. To decide whether a certain network of offenders should be labelled as OC, however, the report looked at recurring offending patterns and the scale of activity, overlooking the debates around the OC definitions and adopting the OC umbrella term to include a broad range of groups exhibiting some degree of organisation.

Similarly, the narrative used in policy-making often assumes a convergence between OC and cybercrime without strong empirical evidence (Lavorgna 2016; Lavorgna and Sergi 2016) but rather by relying on the "seriousness paradigm" of OC, which postulates an often unjustified juxtaposition of the seriousness of criminal activities and the organised character of criminal actors (Sergi, 2015a). As already stressed by Lusthaus (2013), Lavorgna (2015, 2016), Leukfeldt (2015), and Wall (2015) among others, there is not enough consistent and solid evidence to make analogies between cybercrime groups and OC.

With reference to “offline” crimes, the very low standards that have been set for inclusion of different and diverse phenomena as OC have been severely criticised in academia. OC has been accused to be used as “a catchphrase to express the growing anxieties” on the expansion of illegal markets and the perceived growing undermining of the legal economy and political institutions (Paoli 2002: 51). Also, ambiguities around the notion of OC have reportedly been used for producing consensus around increased resources, domestic powers, and international co-operation in policy making (Edwards and Levi 2008; Carrapico 2014), as defining a group of offenders as OC orientates policing responses by allowing more resources and investigative power (Van Duyne 2004; Levi 2014). Unfortunately, the presence of conceptual inconsistencies (or “paradoxes” in the words of Paoli 2002) and ongoing definitional debates hinder the construction of a conceptual and analytical framework to forge advancements in both policing and research (van Duyne 1995, 2004; Van Duyne and Nelemans 2012; Carrapico 2014). OC experts, in contrast with the very low standards set in policymaking, tend to refine the notion of OC to something more and different than just crime that is organised (Schelling 1971; von Lampe 2008; Allum et al. 2010; Varese 2010): as summarised by Lusthaus (2013), OC is also a form of governance within the criminal world.

Our study proposes to advance the debate on the extent to which cybercrime is OC by providing a systematic analysis of 40 cases from the Netherlands, Germany, UK, and US where criminal networks were involved in financial cybercrimes affecting the banking sector. It will assess whether and to what extent these criminal networks meet existing definitions of OC, and discuss the theoretical and policing implications of our findings. Indeed, as the threatening aspects of OC in public debates are related to elements of these traditional, existing definitions, it is important to “test” with empirical data to what extent these elements are present in (our considered sub-set of) cybercrimes.

Data gathering and analysis

Data was gathered in the context of the doctoral research of Leukfeldt and the Dutch Research Program on Safety and Security of Online Banking from criminal investigations into cybercriminal networks in the Netherlands, UK, the US, and Germany (for further details, see Leukfeldt et al. 2016a; 2016b, 2016c).

In the Netherlands, the researcher had access to 18 police investigation files, which provided unique knowledge because of the wide-ranging use of investigative methods such as wiretaps and IP taps, observation, undercover policing, and house searches. For the purposes of this research, only investigations into criminal networks that the police had already “completed” were used, meaning cases for which the investigation team had collected enough evidence for the Public Prosecution Service to decide to prosecute, although a court judgment may not necessarily have been issued yet. Waiting for a court judgment, in fact, would have meant that only a few cases would have been available for analysis as it can take years for suspects to be convicted (for a more extensive review of these methodological issues, see Kleemans 2014). There is no central registration system in the Netherlands that allows for a quick overview of all criminal investigations into phishing and malware networks. Based on existing contacts within the Dutch police, the Police Academy, and the Public Prosecution Service, the researcher asked team leaders and senior law enforcement officers whether they knew of any investigations into networks that used phishing or malware to attack users of online banking. In addition, he examined an online database of court documents (www.rechtspraak.nl) and carried out a media analysis in order to find news reports about relevant cases. This resulted in the identification of 10 criminal investigations. The researcher asked law enforcement officers involved in the selected cases whether they knew of any other phishing or malware case, which resulted in a further 8 cases. All the investigations identified lasted for between 6 months and 3 years and occurred in between 2004 and 2014. Semi-structured, face-to-face interviews with the Public Prosecution Service, police team leaders, and senior detectives (including financial and digital experts) conducted between March 2013 and November 2014, complemented the document analysis of the criminal investigations.

In Germany, the UK, and the US, the researcher did not have direct access to police files. Instead, he reconstructed the characteristics of the cybercriminal networks from the basis of 28 interviews carried out between March 2014 and November 2015 with officers that investigated relevant criminal cases. By relying on existing contacts within the Dutch police (especially the Dutch High Tech Crime Unit) and the Dutch Police Academy, the researcher was able to access interviewees in the UK National Crime Agency, the US United States Secret Service, and the German Bundeskriminalamt (BKA). In addition, wherever possible, official court documents about the cases were analysed. In total, the researcher gathered data for 22 cases: 9 in the UK, 10 in the US, and 3 in Germany. The researcher also used open

source information (e.g., news articles about the case) to complement the information provided by the respondents. The 22 cases analysed covered the period 2003-2014.

In total, 40 investigative cases (and therefore 40 different criminal networks) were analysed for this study. In the rest of this article, networks numbered 1-18 were investigated in the Netherlands, networks 19-27 in the UK, networks 28-37 in the US, and networks 38-40 in Germany. The selected cases were systematically analysed using the analytical framework developed and used by the Dutch Organised Crime Monitor, a long-running programme researching the nature of OC in the Netherlands (e.g., Kleemans 2014; Kruisbergen et al. 2012). The framework considers a number of key elements and characteristics generally associated to OC, such as: the composition and structure of criminal networks, social relationships, use of violence and corruption, and connections with the legal economy. While OC is conceptualised around the world in different ways (e.g., Albanese et al. 2003), the above mentioned characteristics reflect the consensus around the main elements that have to be found in OC as identified by the mainstream literature (Adamoli et al. 1998; Arsovska 2011; Tilley and Hopkins 2008), while other features – such as membership restrictions, secrecy, ideology, specialisation, the presence of ethnic or cultural ties, and so on – are more controversial.

Empirical Results

Composition and structure of criminal networks

None of the networks had a strict hierarchical structure. This, however, does not mean that these networks were completely fluid; all networks displayed dependency relationships and different functional roles. Within the majority of networks included in our analysis (30 out of 40), three different layers could be recognised (Leukfeldt et al. 2016a, 2016b, 2016c): core members, enablers, and money mules. *Core members* initiated and coordinated attacks on financial institutions and directed other members of the network. Without these core members, the crimes could not have been initiated neither committed. *Enablers* provided services which were necessary to execute the crime scripts (i.e., the series of steps needed to commit a crime). These criminals did not work solely for one particular network and advertised their illegal services online. *Money mules* were used to disguise the financial trail leading to core members. Some exceptions occurred in cases where core members did not

need the services of enablers or did not use money mules. Money mules were easily replaceable and criminal networks could use hundreds of them in their attacks, therefore they have not been included in the rest of the analysis if not otherwise specified. In the remaining 10 cases, core members did not need the services of enablers or money mules to execute the crime scripts as they already had all the necessary capacities.

We had in-depth information about the core members for 27 networks. In most of cases (22 out of 27), criminal networks consisted of a stable group of core members – meaning that they committed crimes with the same composition over a period of time – who initiated and carried out attacks on financial institutions. Even when networks had a stable group of core members, however, individual core members often worked together with criminals from other networks. In the other 5 networks (without a stable group of core members), prior to the cyber-attacks criminals used online forums to look for other suitable co-offenders. In Network 34, for example, all core members had their own technical expertise (such as hacking, exchanging digital currency to real world currency, and money laundering); they were all self-employed entrepreneurs active individually on online criminal markets who on occasion worked together.

The investigative cases analysed did not provide a ready-made picture of all the members of criminal networks. However, they did provide a picture of the minimal number of criminals that worked together. We have information about the number of core members and enablers for 36 networks: there were 2 networks with only 4 criminals working together (“small networks”); 21 networks had between 5 and 10 members (“medium networks”); 11 networks had between 11 and 20 members and 1 network had more than 21 members (“large networks”). Network 21 is an example of *small network*. The four core members had all been active in the criminal arena for a long time. They had met each other on chat boxes relating to coding. The core members of this network developed their own malware and used it to steal credentials from customers of financial institutions, and then sold these credentials on online forums. Because the core members had all the skills necessary for stealing the credentials, they did not have to rely on any enabler. Furthermore, there was no need for a large network of money mules (and people controlling these mules) to cash money, as these criminals sold the credentials to others instead of using the information themselves to attack individual customers of financial institutions. Network 18 is a typical example of a *medium network*. This Latvia-based network used malware to steal money from online bank accounts of victims

in various European countries. The exact number of core members is unknown, but criminal investigations clarified that one core member developed the malware, while another one coordinated the money transfers made from the accounts of victims to the accounts of money mules. The core members used nine facilitators to recruit and control money mules. Some recruiters operated from Latvia and others from the countries of the victims. Another enabler forged the identity documents needed for money mules to open new bank accounts. An enabler working at the border control smuggled money mules from Latvia. Finally, Network 1 (*large network*), involved in phishing, had the largest number of core members and facilitators. The eight core members had different responsibilities, such as coordinating the transfer of money to the mules' accounts, recruiting new money mules, and cashing the money from the money mules' accounts. The core members used phishing emails and websites to obtain login codes of online bank accounts. One core member contacted a friend abroad who had a friend that could make phishing websites; the core member gave him the order to make phishing websites for two banks. One of the enablers acted as a call centre agent to get one-time transaction codes from victims over the phone in order to transfer money from their online bank accounts. Furthermore, bank employees, postal workers, and cashiers were involved in the execution of different parts of the crime script.

Social relationships

We got information about the origin and growth of 39 networks. The analysis identifies four types of origin and growth: (I) completely through offline social contacts; (II) offline social contacts as a base and online forums to recruit specialists; (III) online forums as a base and offline social contacts to recruit local criminals; (IV) completely through online forums (Leukfeldt et al. 2016a, 2016b, 2016c). A total of 29 networks fall within the first two types, while only 10 networks are part of the last two types and grew primarily using online forums. This means that offline social ties still play a crucial role in the origin and growth of cybercriminal networks. Core members, enablers, and money mules are recruited using existing social contacts; co-offenders, for example, grew up in the same neighbourhood, went to the same church or soccer club, knew each other from the criminal underworld or met each other in prison. Offline social ties were particularly important in the origin and growth of networks with a stable group of core members: only in a couple of networks with a stable group of core members, these core members were strangers who met each other on online forums and never had real life contacts. The fact that offline social ties still matter does not

mean that online forums are not important for cybercriminal networks. Even networks that relied primarily on offline social ties often did use online meeting places for recruiting specialised enablers, purchasing tools and services, or selling their tools and services. Networks that relied mostly on forums for their origin and growth used them to meet other suitable core members, recruit enablers, and/or sell their criminal services or stolen personal data.

We also looked at whether the networks from our analysis had ties with traditional, offline OC groups. Only in 5 of the 40 networks we found some evidence of this. For instance, Network 25 was a traditional OC group with some members experimenting with high-tech crimes to make additional profits. The core members all had an active criminal career in London for many years. According to the police respondents, some of the core members were part of a well-known crime family involved in fraud, drug trafficking, money laundering, and racketeering. They recruited two hackers from another country to develop malware that allowed them to intercept and alter information of computers within a bank, and then used their criminal contacts to set up bank accounts all over the world to transfer the money. In the 4 other networks, traditional OC groups provided services such as money laundering and access to fake identity documents. It is not known exactly how the core members of the cybercriminal networks and the members of traditional OC networks got to know each other. Network 40, for example, was a Berlin-based group that carried out malware attacks on online banking sites; it relied on members of an outlaw motorcycle club to manage money mules (in the physical world). The core members of Network 24 had known each other from the criminal world in Vietnam; they were involved in hacking databases with credit card and debit card information, developing malware, and selling these information and services on forums to customers from all over the world. They used members of traditional Vietnamese OC as enablers to launder money: while cybercriminals usually pay using virtual currency, the enablers used a network of mule herders and money mules to cash the money.

In the 29 networks where origin and growth occurred completely or primarily offline (types I and II), trust was a major factor to explain their origin and growth. As in traditional offline crime networks, pre-existing social relationships were essential to explain why criminal cooperation started in the first place (Kleemans and Van de Bunt 1999; Leukfeldt et al. 2016a). Similarly, if we consider networks that mainly developed online (types III and IV), in most cases (8 out of 10) trust was gained over a long period of time and, once it had been

established, criminals tended to stick together: core members had been active for years in virtual communities – for instance, via chat boxes for coders, or in forums used by hackers to exchange knowledge. These core members, who initially met each other online, jointly executed all sorts of cybercriminal attacks over time, and used enablers when needed. However, in 2 cases cooperation among core members and enablers was built *ad hoc* for specific cyber-attacks and trust was established in a different way: core members looked for suitable co-offenders on dedicated forums, designed specifically to facilitate these types of encounters. For instance, forum members had different statuses (ranging from newcomers to verified members) and ranking systems were used to rate the services they provided; furthermore, the administrators of the forums tested some of goods and services and labelled them as “good” when satisfactory. Hence, the opportunity structures to meet other reliable co-offenders and to quickly build a system of trust was provided by online forums (cf. Holt 2013; Yip et al., 2013). Prior analysis showed that networks that primarily used online forums for growth were able to perform international attacks with a relative small group of offenders (Leukfeldt et al. 2016b, 2016c).

Use of violence and corruption

In none of the cases we found evidence of violence carried out by core members and/or enablers. In some cases, firearms were found during house searches, but they were not used in the commission of the crimes analysed. A handful of money mules stated that they cooperated because core members or enablers threatened them, but we do not know how reliable these statements are, as observations by police investigators, wiretapped phone calls, and Internet data do not back up these claims. Furthermore, none of the core members or enablers were indicted for violence.

Evidence of corruption was not found in any of the cases. In 10 cases, interviewees pointed out that some sort of involvement of Eastern European or Russian officials was likely to have occurred to explain the success of specific crime scripts. While the police investigations did not provide any evidence of corruption, this absence might be explained by the fact that investigations focused on stopping specific and ongoing cybercrimes, and therefore they might not have had time and resources to additionally investigate corruption.

Connections with the legal economy

In 10 investigations we found evidence of connections between cybercriminals and the legal economy. In 3 cases, bank employees working in banking call centres and postal workers were involved in the crime script. The bank employees provided core members with information about bank customers and their bank accounts that could be used in social engineering attacks, or they made unauthorised changes in the accounts of customers. Examples include increasing the limits of cash withdrawals (so fewer money mules had to be used to cash money) and changing addresses in such a way that postal workers who were working in certain areas were able to intercept the mail with new login codes of online bank accounts. In one case, it was the security manager of a bank who helped criminals to physically get into the bank to place key loggers on computers. In 3 cases, there was evidence of money laundering through the creation of legitimate businesses in the physical world. In one case, the core members of the network developed an online platform on which digital currency could be anonymously exchanged between members. This platform could be used for legitimate purposes, but criminal investigations revealed that this particular platform was popular among cybercriminals. When core members, for example, bought malware on a forum, payments had to be made using this online platform. Finally, it is worth noting that almost all networks analysed used legitimate money transfer services (such as Western Union) and digital currencies (such as eGold and Liberty Reserve) to make payments and manage their profits.

Discussion

Can the networks analysed in this study be conceptualised as OC? Overall, definitions of OC vary extensively, and there is not always a perfect correspondence between the various legal definitions and those used in policy making and academia. Most of the legal definitions of OC tend to be broad, overarching several types of serious criminal activities and including a variety of different criminal groups: after all, defining a criminal network involved in illegal activities as OC suggests the existence of a whole mechanism to tackle, thus orienting the responses of law enforcement and triggering greater investigative powers and tougher sentences in many countries (Levi 2014). Academic literature has already extensively criticised the very loose and vague definitions of OC adopted by legislators, which set extremely low standards for inclusions of different and diverse phenomena as OC with the risk that “the concept might become an empty signifier” (Carrapico 2014: 11).

As summarised by von Lampe (2008), when we boil down the notion of OC we find three different perspectives on OC. First, OC can be about the *organisation* when this notion denotes the presence of more or less stable and structured links among offenders. Second, OC can be about *criminal activities* characterised by a certain level of sophistication and continuity. Third, OC can be about the concentration of *power*, when the focus is on the presence of a systemic condition in the form of an underworld government or an alliance between criminals and political and economic elites (von Lampe 2008). Therefore, OC is not only ontologically different from opportunistic individuals, but it also evokes the idea of an interpersonal and social threat and because of this it constitutes a *bigger* threat. The idea is that what individuals can do, organisations can do it better (Lavorgna 2016).

If we only look at the composition and *structure* of criminal networks, most of the networks observed do meet the existing definitions of OC. As anticipated above, most legal definitions (and working definitions used by practitioners) tend to set very low standards – generally the presence of a minimum of 2 or 3 persons working together over time (e.g., Potter 1994; Finklea 2010; Kruisbergen et al. 2012; Lombardo 2012; Sergi 2015a; Hobbs 2013; BKA 2014; Lavorgna and Sergi 2014), with differences depending on the specific conditions found in the areas where the groups emerged (Lavorgna et al. 2014). Similarly, criminological definitions of OC include a variety of phenomena – ranging from traditional and stereotypical Mafias to simpler criminal groups – and shift from overly narrow to overly broad definitions. Some meta-analyses of OC definitions suggest that a continuing, organised hierarchy remains a key trait of OC for many academics (Hagan 2006). However, others show that when OC is conceptualised in terms of collectives, these conceptualisations vary and terminology (networks, organisations, groups, and so on) is often used in an intuitive, shallow sense. In this way, a wide variety of cooperation structures are encompassed under the OC umbrella term (von Lampe et al. 2006), which might in this way include also most of the networks analysed.

If we look at the *activities*, the cybercriminals observed cannot be easily conceptualised as OC. Indeed, many legal frameworks and criminological traditions would not cover the cybercrimes considered in this study as OC. In countries that link OC to the seriousness of a certain criminal activity – for instance the UK (see NCA 2015; Sergi 2015a) but also the international and European legal framework (Lavorgna and Sergi 2014) – many of the cases

considered in this study would not always meet the threshold of a minimum sentence requirement that has to be met for a case to be labelled as OC². In countries that target instead criminal enterprises (such as the US with the RICO Act) (Albanese 1996; Sergi 2015b), cybercrime is generally not recognised (yet) as one of the activities covered by anti-OC legislation³. If we consider criminological definitions, these have traditionally associated OC with some economic functions, in that its purpose is to supply illegal goods and services (as in the case of drug trafficking), or its profit-oriented entrepreneurial nature is stressed (as in the case of money laundering) (von Lampe et al. 2006; Kleemans 2007). In doing so, however, meta-analyses show that a *quid pluris* is generally present in cases of OC, such as corruption, (threat of) violence, and attempts to gain or maintain monopoly or control over a particular criminal market (Hagan 2006; von Lampe et al. 2006). Therefore, the cybercrimes analysed would meet only the broader academic definitions that do not consider corruption, violence, and so forth as core features of OC; they would not meet those – prevailing – definitions according to which certain crimes might be complex and organised but still not OC if other core characteristics are missing (e.g., Finckenauer 2005).

The conceptualisation of OC as *power* (von Lampe 2008) stresses the systemic presence of OC, here interpreted as something more and different than simply serious crime, or crime that is organised (Lavorgna 2016): it seeks a social function through the control over the production and distribution of a certain commodity in the underworld, protection services, or an alliance with political and economic elites. As regards offline criminality, social functions (and sometimes even quasi-governmental features) are often attributed to OC (Potter 1994; von Lampe et al. 2006; BKA 2014). This aspect, however, is more problematic to recognise in cyberspace. It could be argued that in a few cases criminal networks tried to regulate and control the production and distribution of products and services via online forums: for instance, administrators and moderators can provide a certain degree of third-party enforcement over certain transactions, and regulate the access to the forums. However, contrary to the physical world, they cannot prevent people to try, for example, to access the

2 For instance, in the UK the Serious Crime Act 2015 section 45 specifies that to have an OC group the activity has to constitute an offence punishable with imprisonment for a term of 7 years or more; many of the cases considered in this study would not meet the sentencing threshold according to the 1990 Computer Misuse Act (even after it was amended by the Serious Crime Act 2015).

3 In the US, for instance, the RICO has been used to prosecute cyber-criminals only in a few federal cases (Salvador 2015). In January 2015 the US Administration introduced a legislative proposal that, among other things, would expand the definition of “racketeering activity” under the RICO Act so that it applies to certain cybercrimes (see <https://www.whitehouse.gov/sites/default/files/omb/legislative/letters/updated-law-enforcement-tools.pdf>), but new legislation has not passed so far.

forum with another name (Lusthaus 2013). Furthermore, the existence of online forums is distinct from that of the offenders operating in it (Lusthaus 2013), and even if forum administrators and moderators try to retain customers there is neither a system of enforcement or opposition against competitors nor control over distribution.

Implications and conclusion

The aim of this study was to investigate to what extent cybercriminals operating in phishing and malware attacks can be conceptualised as OC. To answer this question, we analysed 40 criminal networks investigated in four different countries and analysed them through an OC analytical framework. The empirical analysis indicates that, even if the criminal networks considered display the minimum set of characteristics to consider them as OC if we only look at their structure and composition, they mostly fail to meet the existing definitions of OC when it comes to the characteristics of the criminal activities carried out and the social functions of the networks.

Although our analysis provided unique empirical insights to cybercrime research, it also has some limitations. Because data was gathered from people involved in the investigations, we do not have knowledge about the successful networks that so far remained undetected. In addition, all data was collected from Western countries with similar Internet usage. Further research considering complementary research methods (such as virtual ethnography and interviews with offenders) is needed, as well as research focusing on other countries. Moreover, as we looked at cases concerning a very specific sub-group of cybercrimes, further research is needed to allow generalisability towards other types of cyber or cyber-enabled crimes (ranging from online drug trafficking to identity theft to governments and industrial espionage), which might need different organisational structures to be carried out effectively.

Despite these limitations, this study has important implications from both a theoretical and practical perspective. First, from a theoretical perspective, it reveals some challenges in using the OC conceptualisation in cyberspace, which urges reconsideration of the capacity of our current criminological paradigms and definitions to capture emerging trends in the criminal scenario (Lavorgna 2015). The whole idea behind criminalising OC in a different, more serious way is to be found in its dangerousness, which goes beyond the risks posed by individual offenders or occasional criminal cooperation and creates actual or potential threats

to the social order (Fijnaut and Paoli 2006; Carrapico 2014). In cyberspace, however, this is no longer true, as individuals or loose associations can be as dangerous as OC (Lavorigna 2015). However, similarly to OC, the cybercrimes considered in this study (I) cause harm to a concrete victim, (II) produce systemic effects with serious consequences for society as a whole, and (III) adversely affect social control because of offenders' shielding capacity (for an assessment of the harms caused by OC see Fijnaut et al. 1998; Kruisbergen et al. 2012; Greenfield and Paoli 2013). Hence, “organised” – being the focus on the structure, the activity, or the power – has become inappropriate as proxy indicator for seriousness or dangerousness in cyberspace. Instead, better analyses of harm, risk, and threat for specific cybercrimes are urgently needed to guide further research and theoretical developments. In addition, the findings of this research suggest that further analysis addressing the relationships and the intersections between licit and illicit arenas when it comes to financial cybercrimes could be revealing.

Second, from a practical perspective, our findings question the developing narrative of cyber-OC, which despite the lack of clear empirical evidence at times seems to play with the ambiguity of the OC concept to make a point on the seriousness of online threats. The already stretched notion of OC risks to be stretched even more: as a consequence, not only do we risk to lose further its analytical and descriptive value, but also to shift attention and resources from the current anti-OC efforts without a serious reflection on how to deal with new security challenges in an effective and efficient way (Lavorigna 2016). In the ongoing debate on the opportunity to “adapt” the definition of OC when it comes to cyberspace, we should not uncritically embrace the logic fallacy (the Hume’s Law, an is-ought fallacy) according to which if a crime is “serious enough” it should be OC (Sergi 2015a). Rather we hope that this article can stimulate further debate on whether it is worthwhile to label certain cybercrimes as OC – despite the problems outlined above – to give law enforcement enhanced investigative powers or whether it would be better to address cybercrimes in an *ad hoc* way, for specific cybercrimes, giving different (more powerful) investigative powers and resources to investigative and analytical teams without the need to rely on the anti-OC regulatory frameworks.

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