

Shadow supply chains and criminal networks

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In 2020, various governmental and civil society organisations with a strong research interest in the development of criminal activities around the world issued a white paper with the title “Criminal Market Convergence” (USAID and GI-TOC 2020). The main argument of this paper is based on 3 hypotheses: (1) An argument which comes from the literature of organisational theory argues that this convergence is increasing in situations where organised crime groups coordinate with other criminal actors across multiple illicit business lines or purchase illicit goods or services from one another. (2) The second argument is more service-oriented in the sense that criminal and legal markets may converge with licit markets when an organised crime group seeks to conceal its activities through front companies or purchases audit, banking and legal services that support its criminal activity. Finally, it is stated that (3) for the illicit economy the best hubs are states with good infrastructure and markets but weak institutions. Although the major interest of the white paper may have been to point to the overlap and mutual reinforcement of different criminal markets, especially with respect to transport, laundering, nodes and vulnerable points, the general argument promotes a view of poly-criminal networks which have cast a net of contacts and cooperation around the globe that the authorities are not able to control. By using common service providers, the same transport infrastructure and trading practices with other criminal groups, they are linking criminal markets in certain geographical areas not only, but also due to the facilitating conditions of corrupt governments or governmental agencies. This sort of geographical convergence of illicit flows and criminal markets articulates – in this view – a mapping of crime on a global scale that should orient the interventions of the law enforcement authorities in order to interrupt these networks and thus raise the costs of the criminal business.

This “convergence lens” to understand criminal activities on the one hand certainly addresses relevant elements such as the mixing of licit and illicit transactions and logistics, the international character of money laundering and complementary services, but on the other hand it suggests a view of a worldwide interconnectedness of criminal actors with an extraor-

dinary relational power which on a global scale undermines many national action plans to counter crime and control illegal markets.

This article will try to revise some arguments of the “convergence perspective” based on an approach that treats supply chains as an analytical tool, pointing out that these connections are not uncommon in the context of international supply chains and that the different branches of organised crime are not even as interconnected as the convergence argument may insist. Supply chains can be understood as “the world economy’s backbone and central nervous system” (Cattaneo, Gereffi and Staritz 2010: 7). They are an expression of a globalised economy, based on comparative advantages in production costs and resource availability around the globe, a rationale which covers legal and illegal transactions in the same way. Criminal actors have been analysed as behaving like international companies and trying to take advantage of their operations in multiple jurisdictions, with components sourced all over the world. They operate quite smoothly in a world with tariffs and taxes, as the liberalisation of trade in global terms has reduced duties and brought the entanglement of economies worldwide to a new dimension.

Shadow supply chains and illicit globalisation

One of the major topics regarding illicit flows is the demarcation of licit, (il)legal and illicit streams of goods and services. The main distinction does not refer to the harm that the production, transport or consumption of these goods may cause; their illegal dimension is due to the fact that these products or services are prohibited by law, that they are not legal and therefore not licit. From this it becomes quite clear that the category of licitness also covers elements beyond a formally legal character, including social and cultural norms. As we know from ethnological research, some communities consider determined psychoactive substances as licit for cultural uses, although they are legally forbidden (De Rios and Smith 1977). On the other hand, the term “illicit flows” does not refer in the first instance to the transfer of illegal goods or trade in illegal services but rather indicates that the illicit trade can occur – independent of the legal or illegal character of the traded goods – either in black markets or in legitimate markets, with the participation of legally established agents or informal or even criminal actors in these marketplaces. The illicit character therefore does not derive from the status of the goods but from the type of transactions that occur during the production, transport or consumption of the respective good or service. As we know from transnational crime

research, this kind of trade passes through different jurisdictions, which may not be homogeneous with respect to the legal or illegal status of the different transactions. Therefore, it makes sense not to insist on clear-cut “categorical distinctions between licit and illicitness, but continuums of state practice [...], which encompass organized criminality, and enterprises that span the licit/illicit spectrum” (Hall 2013: 372).

Clandestine economic flows continue to cause concern, not only in state agencies but also in firms and enterprises, which fear the disloyal competence of illicit agents. The subversion of existing supply chains and transportation networks for illegal purposes has become one of the major threats, as part of what has been defined as “illicit globalization” (Andreas 2011) or “deviant globalization” (Gilman, Goldhammer and Weber 2013), based on the argument that both licit and illicit actors take advantage of the reduction of transaction costs. What began as the smuggling of narcotics across borders has evolved into transnational commercialisation of endangered species, counterfeit and stolen goods as well as illicit antiquities. What is being sold at international art fairs or presented in private zoos etc. may be or has been obtained by illegal extraction, excavation or simple robbery in other territories and states. In the panoply of criminal activities and illicit economies, the trade in arms and toxic waste receives high public attention (especially due to the growing interest in knowing what is happening on the darknet) (Persi Paoli et al. 2017), while other dimensions such as transborder car theft have become a more regular experience in police stations and customs offices (Felbab-Brown and Niño 2021).

Whereas cargo crime is related to theft (exiting) from the supply chain, smuggling can be viewed as ‘entering’ a supply chain. Whilst one destroys value in the supply chain by causing disruption, the other (smuggling) is not designed to create disruption at all. Criminals are as interested as legal shippers in ensuring that their consignments reach the destination in a timely fashion. However, countermeasures designed to intercept illicit goods have the impact of disrupting logistics systems for both legal and criminal parties.

Illicit trade that operates in the shadow of the global economy is characterised by a high diversity of illicit goods and services such as the trafficking of humans, narcotics, counterfeits, fake medicines, endangered and illegally harvested species of fauna and flora, antiquities and conventional arms. At the same time, there are various international standards in place to prohibit or regulate the different sectors of illicit trade and to promote the implementation of legal, regulatory and operational measures to combat the proceeds of illicit flows, which are supervised by the World

Customs Organization (WCO).¹ The growing number of operators who enable the illicit economies makes it even more urgent to deter their activities in order to prevent harm to persons, businesses and the environment. The negative externalities of the illicit economies range from the loss of revenue and market share up to diminished brand integrity and market reputational value, not to mention further consequences for security concerns in general, the environment or the livelihood of people.

Supply chains are economic structures where the legal and the illegal flows can overlap and mix, which is most interesting for the criminal actors. On this basis, we consider as “shadow value chains” those “that run, often in parallel, or intertwined with legal value chains” (Stridsman and Østensen 2017: 6), pointing especially to the fact that the diversion of resources from the legal interchange enables and sponsors other types of illicit activities. So at first sight, the analytical perspective of shadow supply chains seems to correspond to the convergence arguments on poly-criminal markets. But analytically we have to distinguish between the market level on the one hand and the structure which provides these markets on the other hand; then the question arises whether the supply chains also follow a convergence dynamic or whether this diagnosis should be limited to certain market segments. The central question to be answered is what differentiates “shadow supply chains” from their legal counterparts? At first sight is that they limit the participation of certain actors (e.g. competitors). Although criminal actors try to maintain control over access to the markets, they provide their own goods, displacing the legal supply by a better pricing of the products and using violence to dispel competitive supply. This includes the interest to mix legal and illegal components in the supply chain itself, following the logic of the main strategic rationale of the profit orientation in the grey market to exclude competitors from market access and foster a monopolistic position in the marketplace. In order to provide insights into the differential composition of these mixtures, I will refer to different sectors and pathways of criminal activities as examples.

1 The best known standards are: The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); the Montreal Protocol on Substances that Deplete the Ozone Layer; the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; the Stockholm Convention on Persistent Organic Pollutants; the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; the Cartagena Protocol on Biosafety; and the Minamata Convention on Mercury.

The fluid limits of the legal/illegal and illicit in supply chains: the central role of intermediaries

With a perspective on the specific role of intermediaries, it is necessary to distinguish different forms of governance in supply chains. The extended literature on this topic cannot be reviewed in this text, but to address the illicit dimension in the chains it seems helpful to distinguish between chain coordination of the individual linkages (“forms of coordination”) and the governance of the entire chain (“modes of governance”). The latter refers to defining rules and conditions of chain participation (Ponte and Gibbon 2005) and the functional dimensions of the different actors. From the start, one has to recognise the difficulties of clearly separating the legal from the illegal, looking at illicit dimensions of flows with respect to a certain good. For example, the dual nature of cigarette consumption (i.e. the coexistence of a legal and an illegal market) causes the illegality of a cigarette to depend on its supply chain, which complicates the identification of illegal products. To some degree, the intensity of enforcement efforts reflects the difficulties in those dual markets where smuggled items are not easily discernible from legal ones. The knowledge about the transnational flows is therefore rather limited, and in many cases it is only on the basis of an extrapolation of seizures that an estimation of the size of markets and the value of traded goods has been possible. A different approach is to use social network analyses to identify the extension of criminal networks by the density of communicational contacts between certain nodes or intermediaries in order to counter suspicious transactions, an approach which has proven most fertile on the micro level (Giommoni, Aziani and Berlusconi 2017). Which are the elements that differentiate illicit supply chains from legal or licit ones?

In his report on illicit supply chains, Mackenzie (2002) identifies four different types:

- Illicit at source, transport and destination (narcotics)
- Illicit at source and transport, but licit at destination (diamonds, antiquities and certain minerals). Audit and certification systems have been put in place in order to prove the provenance of the goods and their legality.
- Licit at source, but illicit transport and at destination (firearms, people smuggling)
- Licit at source, but illicit transport and then licit at destination (cigarettes)

This complexity that certain goods at one moment in the supply chain have the characteristics of “legality” generates major difficulties for the authorities in dealing with those illicit supply chains and managing to control grey areas. For our analysis, the legal-illegal interface is a general problem due to its changing character in the different stages of the supply chain and depending on the concrete product which is being processed. For this reason, we prefer to look at some empirical evidence that can give us further orientation. In cases such as timber exploitation or wildlife trafficking, intermediaries play the decisive roles in this interface (Lavorgna 2014; Kleinschmit et al. 2016). Their roles are important in the supply chain, as they not only bring together supply and demand but ‘make things happen’. Without the intermediaries, the illegal chain would be weak or even broken, as they “transform” the product or create the conditions for it to move from origin to destination.

In the case of wood from the Colombian Amazon, for example, it must be taken into account that in the process of exploitation and for subsistence purposes, indigenous and peasant communities carry out logging, slash-and-burn agriculture, cattle farming in reserved zones etc. Intermediaries interested in the product, such as “gasteros”, are those who have financed these activities over the years and who help the communities obtain exploitation permits and other requirements, as well as loans (with high interest) and machinery necessary for the activity. Gasteros give the community a minimum profit or some assets such as school supplies, food or provisions. What deserves special attention is how these intermediaries usually profit not only from the product they obtain, but also by obtaining signatures and documents to “apply for forestry permits and safe-conducts in the name of the communities” (own translation), although this is to be understood as fraud from a legal point of view; however, for many community members this practice appears legitimate and accepted, in part because the profits and goods obtained meet the needs that the state unfortunately does not fulfil (EIA 2019: 32).

In addition to the “gasteros”, there is another type of intermediary: the proxies. Their work consists of paying fixed amounts to the owners and holders of lands, whether communities or peasants, for signing documents that allow them to obtain logging permissions and legal representation of those territories before the environmental authorities. These proxies can use strategies such as obtaining authorisations to log certain areas and then carrying out the actual logging in others.

Referring specifically to wildlife trafficking, Phelps, Biggs and Webb (2016) describe different types of intermediaries; however, they can be

transferred to other supply chain contexts as they fit them all, forming a conceptual framework:

- **Logistician:** involved in ordering, aggregation and transport, as well as financing and planning trade
- **Specialised smuggler:** specialised in actions to evade detection or negotiate access
- **Government colluder:** involved in using an official government position to facilitate trade, whether for financial (corruption), social or personal gain
- **Third party:** external services hired to support trade, potentially unknowingly.
- **Processor:** involved in product transformation (e.g. skinning, medicine preparation)
- **Launderer:** involved in laundering illegal wildlife into legal supply chains
- **Vendor:** involved in direct sales to consumers or sales to other intermediaries

In the process of illegal trafficking of goods, the criminal patterns that can be applied to different supply chains can vary, but in many cases they also have an overlapping dimension. As mentioned, organised crime networks may overlap with intermediaries but are not necessarily involved in the entire chain. This typological exercise suggests a certain caution in applying the organised crime framework as the only lens through which illegal traffic can be analysed. Empirical evidence hints at the multiple influences exercised inside the supply chain: organised crime networks are by no means isolated from producers; they can overlap them in some way or be a part of them but may also influence them, as in the case of gold and drug trafficking in Colombia (see the respective chapters in this volume). On the other hand, corruption and laundering processes depend on the intermediaries, whether they are directly involved with organised crime or not.

The illegal traffic of products and goods and the black market are not isolated from legal markets and goods; in fact, what allows them to exist is the coexistence with legality and the diffuse frontier between actors (state institutions, people, companies and their documents) and legal processes on the one hand and the illegal terrain on the other. A study on the convergence between legality and illegality in wildlife trafficking showed that more than 30 % of actors involved in that market are registered animal traders (Van Uhm and Moreto 2018).

The links between legality and illegality are not necessarily direct. Indeed, there are different degrees of directness and factors such as risks and benefits that affect both parties involved in this relationship (Passas 2002: 15); in fact, these are of various types, grades and functions, ranging from antithetical to symbiotic relationships.

Table 1: *The nature of the legal-illegal interface (Passas 2002)*

ANTITHETICAL RELATIONSHIPS	Antagonistic: competition between legal and illegal actors.
	Injurious: when actors undermine, attack or harm each other.
	Parasitical: when the aim is to preserve the viability of the target, such that illegal benefits can be extorted on a more or less regular basis.
SYMBIOTIC RELATIONSHIPS	Outsourcing: division of labour between legal and illegal actors, where one party offers specialised services to the other.
	Collaboration: legal and illegal enterprises or actors actually work together for the commission of the same offense.
	Co-optation: involves mutual benefits; there are uneven power relations between the parties.
	Reciprocity: deliberately mutual benefits between the legal and illegal actors.
	Synergy: when legal and illegal actors benefit each other while they go about their business independently promoting their interests and objectives.
	Funding: legitimate organisations providing, knowingly or not, essential financial support for the operation of criminal groups.
	Legal interactions: Diversification not only for money laundering purposes, but also for the reduction of risk and maximisation of benefits.
	Legal actors committing organised crimes: legal actors engage in well-organised and sophisticated crimes on their own.

Dimensions and dynamics of shadow supply chains

Illicit supply chains, just like legal ones, are organised to be secure, redundant and resilient to disruption. In many supply chains, subcontracting has become the dominant organisational rationale regarding transport specialists, assassins for hire, corruption nodes, money launderers and legal actors like lawyers, accountants and bankers (MacDermott 2021). Criminal supply chains “are often designed with an extensive compartmentalization of operational knowledge throughout the layers of the various organizations involved [...] with redundant nodes and simplified roles to limit the potential negative impact” (Deville 2013: 65) when competing actors or law enforcement agencies try to intervene in the network. While in earlier articles (Neumann 2013) the expectation of a convergence of criminal organisations to form illicit networks was stated, this view had to be revised due to growing rivalries and violent confrontations between different networks, especially when they compete for the control of routes, border crossings or other places and nodes. One of the approaches to interpreting different places and nodes is the concept of “criminogenic asymmetries” (Hall 2013: 374) which depend on diverging economic conditions and regulatory regimes and are exploited in the organisation of illegal flows from South to North as well as from East to West. In order to identify the different dynamics and dimensions of shadow supply chains, especially with respect to uncovering the strategies of criminal actors, it is advisable to proceed with a mixed approach which combines three dimensions: products, activities and networks (Anzoom, Nagi and Vogiatzis 2022: 145).

Places and nodes

In applying the network approach, it is analytically fruitful to identify “hubs and nodes” which articulate networks, partnerships and interactions of the illicit. As a recent analysis puts it for the cocaine supply chain: “Different criminal nodes will align for a particular shipment, then drift apart, searching for new opportunities and trafficking constellations” (MacDermott 2021). Also, within the EU, a decentralised pattern of rather disorganised supply chains with manifold individual transactions is prevalent, especially in internet-based transactions (Europol 2021). Moreover, illicit flows have changed in the context of the pandemic; cyber marketplaces and internet online shopping have become a new venue where supply meets demand. This has created new opportunities for the commercialisation of counterfeit products or otherwise fraudulent goods. What has

been detected is a new surge in the distribution of pirated assets over the internet. There is empirical evidence that the distribution of drugs on the surface web and the darknet and supported by the postal services has become a new dimension in this transnational illegal business (EMCDDA 2016).

This new marketplace complements the established nodes used for mixing licit and illicit trade activities, as do the free trade zones (FTZs), where strategic actors have placed their facilities in order to interconnect their international presence in relevant markets and establish their logistic networks. In these hubs, goods are landed, handled and manufactured but also repacked, reconfigured and reexported without the intervention of the customs authorities. So this type of procedure permits changes in the status of the goods in terms of their licit/illicit character, e.g. by introducing counterfeit and pirated products, which permits a stage of metamorphosis of the product. Although these key transshipments points produce economic benefits for host countries and hosted companies alike, they can also compromise both actors in their reputation when they are not managed according to due diligence and transparency standards. The pure numbers of these nodes for global trade are impressive: The OECD/EUIPO report (2018: 16) mentions more than 3,500 free trade zones, which are often located at key ports, in 130 countries or economies in North and South America, the Asia-Pacific region, Europe and Africa. In these nodes, enterprises take advantage of the interconnection of supply chains, using the FTZs' special offer of low tariffs and lighter regulation on financing, ownership, labour, immigration and taxes in these areas. At the same time, FTZs serve as places for concealing the origin of illicit products which are repacked and relabelled to enter the legal supply chains. For this reason, in order to reduce illicit trade risks in the FTZs (OECD 2019) these conduits of illegal trade are subject to joint efforts by the authorities to improve compliance with international standards of transparency. For these efforts to be effective, it is recommended to also include shell companies that mask the beneficial owners in these corporate structures.

International hubs of communication are also relevant nodes in the transformation of the supply chains or their management. New markets have been configured for illicit goods due to their future centrality: Most obviously, this is visible in emerging markets in the Gulf states, Russia, East Asia and beyond for antiquities (Brodie et al. 2022); China as well as India are major actors in the production of counterfeit and substandard medicines (OECD and EUIPO 2017: 6). By exploiting the fragmented character of these supply chains, the "continuous change of hands can mask the provenance of counterfeit medicines, making tracing almost

impossible and making it hard to identify who is making the counterfeit drugs” (OECD and EUIPO 2020: 42).

These examples give a clear indication of the hubs and nodes that are central to the configuration of different shadow supply chains, which has to be identified in each case. Not to forget, there are also hubs for “cooling off” stolen products or maintaining some sort of safety stock and thus trying to control the inventory in order to avoid detection or control prices. But we can infer at this point the essential role that intermediation plays in the functioning of these structures, as the respective transactions may vary rapidly and can change without more in-depth traceability. The new dimension we can identify looking at supply chains beyond the reconstruction of series of individual transactions is to trace “pieces or nodes as a part of a series of recombinant chains with links that can merge and decouple as necessary” (Farah 2012: 2). This is also valid for interdiction in shadow supply chains: as we know from drug trafficking, rivalry or even enmity is an element of the criminal scenery. Instilling intensifying conflict between nodes or clusters of nodes has been a rather efficient way for law enforcement agencies to disrupt criminal networks.

As we know from research on bribery, intermediate structures or persons are of critical importance for the organisation of illegal/legal procedures and the “transformation” of the status of goods. The supply chain literature has shown that intermediate structures such as smelters for raw materials or sawmills in the illicit trade of wood are essential points where transparency and traceability will come to a chokepoint and even to a rapid stop (Muirhead and Porter 2019). So these points in a supply chain are of major concern in the tracking of illicit proceeds and of the participants in those stages of the supply chain.

Intermediation and disintermediation: the role of the middlemen

In the literature on organised crime, the “fixer-centric understanding” of the phenomenon has taken into perspective the facilitators as central agents for empowering the network structure in the shadow supply chains. The term “intermediaries” has been defined to refer to “all parties who act as a conduit in international business transactions, e.g. agents, sales representatives, consultants or consulting firms, suppliers, distributors, resellers, subcontractors, franchisees, joint venture partners, subsidiaries and other business partners including lawyers and accountants. Both natural and legal persons, such as consulting firms and joint ventures are included” (Working Group 2009: 5). The concrete form of the agency

of the middlemen varies from facilitators to complicit actors, which may range from customs officials, appraisers and dealers to lawyers, who may routinely facilitate the illicit market simply by being reluctant to exercise the oversight they could apply. The services that they are providing as middlemen include issuing fake documents, organising auction mechanisms and facilitating the movement of the goods through numerous jurisdictions by identifying loopholes. The expectation concerning the role of the intermediaries is that they support the matching of buyers and suppliers and create trust in the process, functioning as certifiers of the quality of the product. In illegal or illicit transactions, the relationship between demand and supply is essentially characterised by a deficit of trust due to the surveillance strategies generated by the security agencies or possible competitors. Experience shows that no one in the chain of supply is likely to inform on the intermediaries. For these reasons, some criminal actors might prefer disintermediation, bypassing the middlemen, especially when their commitment is not credible or when they overstretch their bargaining power (Biglaiser and Li 2018: 18).

For this reason, actors in illegal markets may rely on different strategies concerning the organisation of their ties, seeking to establish weak links with customers for security reasons or opting for strong linkages with their partners in order to maintain control of the marketplace. The concrete selection of the preferred strategy will depend on the products and the structure of the market, in particular its mono- or oligopolistic characteristics. Also, in some product categories we will face conditions of monopsony or oligopsony which determine the presence or dispensability of middlemen. As we know from Granovetter's (1973) seminal analysis of network structures, more dispersed, nonredundant, open networks have greater access to information and power than smaller, denser, and more interconnected ones, resumed in the thesis of the "strength of weak ties", which also applies to the dark field of business relations.

For the organisation of the shadow supply chain, the criminal actors can opt on the one hand for a redundant chain of different intermediary structures with compartmentalised operations which don't know the "owner" of the supply chain for whom they are acting (multiple intermediary case) and try to guarantee by this anonymous character of the intermediation agents that interventions by state authorities or competing providers of their goods or services cannot cause major damage to the entire supply chain and its management. On the other hand, criminal actors might opt for a low-risk environment by adopting a disintermediation strategy that reduces the number and the role of the intermediaries, pushing the established intermediaries out of a market niche. Instead, they can rely e.g.

on electronic commerce via the internet or on the darknet, implementing a model of online dealing that has been developing most successfully in medicines and online drug marketplaces (EMCDDA 2015). Anonymous transactions have been facilitated by hiding IP addresses and operating with Bitcoins, thus reducing violence and face-to-face contacts as well as hiding identities. This sort of ‘disorganised’ crime in de-centralised markets based on encryption strategies is expanding rapidly and represents a new variant of hybridisation of illicit supply chains which combine surface web stores, social media contacts and cryptomarkets (Aldridge and Décarry-Héту 2016).

The transport dimension: illegal trafficking

Modes and routes of transportation, especially the number of transshipment points, are essential in the determination of profits and the distribution of risks (Basu 2014). Shifting routes is one of the most widely practiced instruments for avoiding interdiction and the presence of adversaries such as rival organisations, concealment capability being the second most employed tactic.

Most illicit markets are transnational, and the goods are not consumed where they are produced. The flow of illicit products is one of the preferred intervention points for the authorities in order to detect the trafficking. Although in many cases the concrete routes of transport are not exactly known, in the most studied case of illicit flows, which is drug trafficking, drug consumption and prices and especially their dynamics are used as a predictor where the product will be shipped. The demand for cocaine and the size of the markets in the US or Europe are employed to infer the direction of trafficking flows. The main interest of the law enforcement agencies at the international and national levels is to identify the major hubs or transit countries in order to exert pressure on them and try to prevent the products from reaching the own national territory (Giommoni et al. 2017).

But it is not always feasible to clearly distinguish between the country with ‘outflows’ and the one with ‘inflows’, in part due to complex market structures and product specifications or branding as well as unclear product descriptions in macrodata models and categories, especially in simulations for political purposes. Moreover, all deliveries of goods rely on transportation networks for the exchange of legal and illegal goods, a variable which is also influenced by lower-tax or higher-tax regimes, as in the case of cigarette smuggling. It is also assumed that the geographical

scope is influenced by a double “neighbouring effect”, in the sense of (1) the existence of geographical clusters served by the same routes chosen by traffickers to ship the illicit product and (2) a “spillover effect” of the same criminal networks using the same transport facilities for other illegal goods in order to minimise their costs. Empirical studies suggest a high density of illicit goods flowing on few transport routes (Aziani, Berlusconi and Giommoni 2021). Apart from geographically given conditions with fixed flows of licit goods, there are complementary factors such as established opportunities to bribe customs officers, the use of kinship and ethnic ties in foreign trade and knowledge about the routines of law enforcement agencies in specific countries. All these elements are helpful in reducing the risks of being discovered and in maximising the profits in the transactions. Comparative studies have shown that in the trafficking of different types of illicit goods, for example drug trafficking or antiquities smuggling, the flows show a clear distinction between source and destination countries, which means mostly unidirectional flows, while in cigarette trafficking a very complex network of multidirectional movements seems to exist (Meneghini, Aziani and Dugato 2020: 18) as well as different roles that countries play in these markets.

Another aspect which constitutes the interface between illegitimate and legitimate is transport, where legal and illegal products are often mixed and shipped to the consumer markets without distinction according to their legal status. Transport and access to central places where logistics are organised are paramount for allowing crime to profit from free market conditions. For example, the grey market nature of the antiquities trade, where illicitly obtained objects become effectively laundered by insertion into legitimate streams of supply, is a case characteristic of this type of procedure. The same is true for the sector of counterfeit goods, where China has been identified as the top producer, while Hongkong, Singapore and the United Arab Emirates serve as the global transit hubs for this type of illicit trade. By obfuscating the provenance in the chains of supply, the consumer market for certain products like antiquities transforms into a grey market of “those who do not know, or do not want to know” (Mackenzie 2011: 79).

In order to understand the role of transport, it is of central importance to calibrate the nature of the trade, especially its organisation and operation. The extension of the criminal network and the size of cross-border illicit flows are the critical variables for estimating the volume, the scope of the transport facilities as well as the capacities to control illicit trafficking. The traditional view of identifying the trafficking routes is becoming obsolete due to the growing importance of the internet trade. It is becoming

more difficult to discover identities through a mapping of the structure in a transnational illicit network, especially for certain small and easily portable products and amounts, given a nearly infinite and easily multipliable number of storefronts and very differentiated transport facilities to serve them. This kind of decentralised and retail distribution exists in parallel with the more traditionally organised high-value supply chains headed up by well-connected dealers.

The trade is also related to traditional ways of transport (maritime, land- and air-based), which allow for different forms of concealment and are subject to sudden rerouting if obstacles arise: “(1) false information on the container’s manifest, claiming that the container carries legitimate items; (2) false legal documentation such as import licenses (e.g. false declarations, consignee’s contact details, etc.); (3) fraudulent packaging (e.g. illegal products have been hidden in boxes labelled as commercial products); (4) concealment of illicit goods among legally imported products; and (5) the use of transit places, which can serve several purposes depending on the stage of the journey” (as has been shown for the case of Tramadol trafficking in UNODC 2021: 32).

Stages and participants

Supply chains are always associated with production, (internal) trade, distribution and consumption, organized in the different roles of supplier, manufacturer, distributor, retailer and consumer. All these stages are related to products, which in passing through them undergo some sort of transformation, be it in the product itself or in the value assigned to it due to a greater geographic proximity to the final consumer. The architecture of the supply chain, its network character, is determined by the distribution channels or the (illicit) actors who are able to manage the structure to ensure high levels of connectivity. The factors that drive illicit supply chains, i.e. the transactions and interactions inside of the supply chain, may have a legal or illegal character, which means that the trade itself need not be illegal in general (due to smuggling or counterfeiting, product piracy, miscoding, evasive route selection, document forgery, corruption of officials). Also, at the different stages of the chain the distribution of revenues is unequal, the most typical case being that a substantial share is extracted at the level of distribution, while producers and retailers receive less benefits along the chain (Aguiar de Medeiros and Trebat 2017).

Shadow supply chains and illegal trafficking should not be considered a phenomenon that necessarily corresponds to organised crime and/or

vice versa, nor should the actors involved be considered to belong to organised crime structures; although the relationship is close, it should be analysed to what extent and in what phases they belong to organised crime frameworks. This is because in the production/smuggling there are stages and individual actors with their own interests (who do not belong to any organised structure) that play a role in these dynamics and cannot be ignored.

The first essential stage is the local level, where the actors have to know the territory and be accepted in some way in an environment that can turn extremely hostile to outsiders. This applies to wildlife traffickers who act locally and on a small scale as well as in the trading market for antiquities and cultural items. According to the perception of some archaeologists, who are experts in this business, organised crime networks are not necessarily involved as long as the trafficking operates at the local level (Proulx 2011). In fact, the author states that situating the trafficking of antiquities and cultural goods solely within the framework of organised crime may be erroneous, insofar as “it overlooks the micro-level social and organizational complexities of the antiquities trade; that is, the local realities of looting and trafficking are lost within broader global abstractions” (Proulx 2011: 24). In this way, at the local level, providers, producers or even communities have to be treated differently than the operators of the international trade.

The second stage includes the concealment of the origin. In the case of timber trafficking, the greatest cases of corruption and fraud have been found in the Amazon region. Several reports by Greenpeace have provided detailed evidence of how this phenomenon occurs. Since 2014, this NGO has warned that legal documentation does not guarantee the legal origin of timber; this is due to the dynamics of fraud and corruption both in obtaining licenses and in the extraction and commercialisation processes, which make it difficult for the authorities to determine the legality of the timber (Greenpeace 2018). Estimates of the volume of timber to be cut are made fraudulently, mostly by increasing the numbers through fake identification of the trees and inclusion of non-existent trees (size and quantity), due to the activities of the logging companies which carry out the exploitation; in this way, “imaginary trees” are created, giving the firms the chance to legalise illegally cut timber. This is one of the strategies for illegal extraction.

Once the illegal timber is camouflaged in the legally felled timber, with false documents and transport and sales authorisations, it goes directly to the sawmills, which then saw the timber. After this processing step, it is impossible to distinguish its legal or illegal origin. The foreign companies

that import this timber accept the documents, in many cases without asking about its legal status and omitting audits or independent legality tests (wood laundering). One of the sawmill companies investigated for dubious domestic and international sales is Rainbow Trading, which exports to companies in Belgium, China, Denmark, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden, the United Kingdom and the United States (Greenpeace 2014; 2015).

With respect to the third stage (export, transport and trade), it cannot be ignored that consumers and importers are involved as well. Exporting companies obtain wood from sawmills, or process it themselves, satisfying specific needs of buyers in terms of species and types of wood (Greenpeace 2015). This also applies to the case of cultural property. One of the ways to “launder” cultural property is to exhibit or present it to the public through displays and exhibitions and even by opening private museums (García 2013: 27). This artifice of promotion and public diffusion allows society to assume or know about its existence, but above all it seemingly “legalises” the property of the goods.

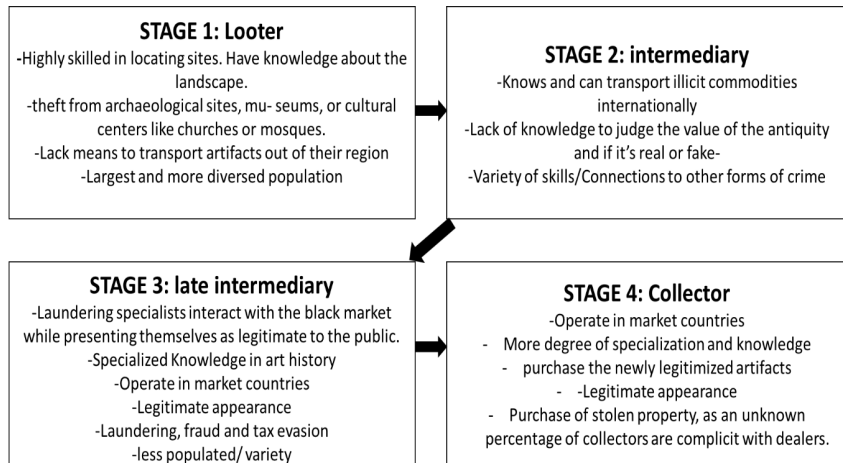
It is important to note, as stated above, that for smugglers, routes and methods are associated with other types of trafficking. This seems to be in line with the convergence argument, but each market has particular markers regarding the product and the actors involved in the supply chain. In fact, “[c]riminals who engage in the illegal wildlife trade are often merely transferring the skills, connections, transport routes, counterfeiting and concealment techniques they have developed in the areas of drugs, small arms or human trafficking” (Cowdrey 2002: 4); nevertheless, shadow supply chains and their respective markets are product-specific. This applies to the antiquities trade the chain/process as well as in the case of wildlife trafficking, which varies according to the type of product or species being transported (animals, live or dead plants, parts of unprocessed animals, such as skins, tusks or bones, or processed goods, such as ivory carvings, traditional Asian medicines or sawn timber), which have their own features for multiple re-exporting in order to cover offences (Schneider 2008).

According to Campbell (2013: 114), the antiquities trade has similarities with other goods trafficked through networks. A common pattern is the demand in wealthy countries that drives individuals in economically depressed countries to export goods abroad. This transnational trade requires sophisticated strategies and organisation in order to succeed, and this is not necessarily due to a hierarchical structure but to “fluid network structures”, generally with personal interactions and no other obligations. Different kinds of actors play roles in this process, from farmers and looters to

trained professionals and experts in this matter “whose only connection is a shared opportunity” (Campbell 2013: 115).

The antiquities trade, according to Campbell (2013), seen through the lens of role specialisation shows the need to collaborate and accept a smaller portion of profits in exchange for a higher success rate.

Diagram 1: Based on Campbell (2013); stages in illegal antiquities trade



This diagram shows that the later the stage and the more specialisation in art and antiquities is invested, we can identify an increase in the profit rate for the criminal actors active in the chain, ending up in auction houses, museums and the houses of private collectors (Alderman 2012) which pay high prices for illegal products.

The organisation of shadow supply chains: criminal diasporas

In the discussion on the organisational aspects of illicit supply chains, one of the dominant approaches is to analyse the factors that contribute to organised crime spreading beyond national borders and being able to develop transnational dimensions. Again, the convergence argument is presented as a general explanation, as the expansion of illegal flows may contribute to the corresponding organisational patterns of the criminal actors that permit their operativity in multidimensional markets and the movement of different goods and services. For this reason, attention is

predominantly given to the type of linkages that criminal organisations are able to establish, be it by migrating the respective networks, spreading out or linking up with other organisations. The decision whether to invest in the development of local markets or in expanding the network into new markets seems to depend on the specific structure of the markets and the corresponding supply paths, their profitability and the methods of expansion that are at hand (Santamaría 2013).

As illicit markets can prove to be very complicated due to the multiplicity of (violent) actors and the offensives of state agencies, the criminal actors will prefer to rely on established structures such as “criminal diasporas” which have been established or can be activated on short notice. These diasporas are constituted by ethnic bonds and family and kinship structures but are also the result of governmental offensives against criminal organisations. Examples of this kind can be found in the spread of criminal activities to regions with less capacity to resist illegal activities due to the “balloon” and the “cockroach” effects (Garzón et al. 2013: 11–12) that expanded the presence of criminal actors to new areas. This collateral effect has been present in the drug trafficking of cartels in Colombia, Mexico and Central America, but also in the metropolitan areas of Brazil. The deportation of criminals from the US to Mexico and Central America has also contributed to the diffusion of criminal patterns, in some ways reproducing the experience of the youth gangs (Maras) in the region. This new type of geography induced by illicit flows has seen an expansion to West Africa in the 2000s (Brombacher and Maihold 2009) and has been changing in transit countries as well the transport facilities over time (Bird 2021). The initial connections between Brazilian traffickers and Nigerian criminal groups are expanding from Senegal through the Gambia and Guinea-Bissau to Guinea and Cape Verde (UNODC 2005; Bird 2021). This reflects the capacity to adapt to new conditions in the flows of drugs as well as the inherent fragility and instability of illegal supply chains, which always have to be adjusted to external pressure, internal redesign and new market dynamics. One of the major challenges in these dynamics of internal re-regulation is the asymmetric distribution of profits along the supply chain, where in many of the chains one can identify those actors which are closest to the final consumer markets and able to realise the largest profits all along the supply chain. As backward linkages in illicit supply chains are less developed and the transaction costs are realised at each stage of transaction, the final stage of delivery in the consumer market offers the best conditions for the accumulation of the value added and the profits generated by the successful passing of the product through different borders and distributing hands.

Tracking shadow supply chains and illicit networks

Tracing shadow supply chains is one of the most difficult tasks of law enforcement, in part due to the subversion of existing supply chains and of the corresponding transportation networks for illegal purposes. One possible approach is to distinguish between criminal procedures for “exiting” the supply chain (e.g. cargo theft) on the one hand and those centred on its “entering” side, that is, smuggling of products and persons, on the other hand. The measures taken by law enforcement agencies in order to intercept illicit flows cause the same disturbances as the theft of products in so far as they interrupt the logistics systems for all the market participants. The main discussion is therefore centred on the issue at which point the supply chain interruption should occur, as illegal goods as well as legal ones pass through processes of added value as they are moved along the supply chain (as was mentioned earlier in the description of the role of intermediaries). The convergence argument reappears here very prominently, as law enforcement agencies claim that illicit supply networks can just as easily be used for other goods (e.g. in the trade of illicit cigarettes it may be most appropriate to also move drugs or antiquities), making use of the corruption of the same border officials and customs agents. The use of legitimate carriers and freight forwarders is of central importance for “piggybacking” illicit supply chains on mainstream transport networks (Manners-Bell 2018: 247ff.), covering traces and thus making products untraceable.

Law enforcement agencies have considerable difficulties in tracking the complex structures of illicit networks, especially when they try to disrupt the entire network structure. On the one hand, they can focus on the flows of illicit goods and services in the shadow supply chains with the limitation that they cannot really grasp the entire network; on the other hand, they can try to intervene in the flow of payments by surveillance of money laundering activities. While finance is a critical resource in supply chains, the traditional way of transferring money in cash is being substituted by non-cash payments such as cryptocurrencies that guarantee anonymity and security to the criminal actors (Foley, Karlsen and Putniņš 2019). Again we meet the convergence argument, as a linkage of actors and networks around certain common methods and instruments in money laundering and “barter trade” has been identified. But this kind of relationship lies

more in the area of activity appropriation for a certain stage of a criminal network and does not reach the level of a symbiotic relationship.²

Illegal trafficking and common patterns in supply chains

The configuration of vast illegal markets for legal as well as illegal goods and products such as drugs, timber, gold and other minerals, antiquities and other cultural goods, medicines and even human beings or parts of them (organs such as kidneys) is very complex, as the interactions as well as the goods or products can continuously change their status as legal or illegal. With this growing and mutable problem, an important question arises: How do networks of illegal trafficking continue to exist and operate successfully even when the authorities make multiple efforts to combat this phenomenon? In order to arrive at an answer, in a first approach we will try to identify common patterns involving actors, processes and dynamics in the trafficking chains, independent of the product or good. Also, the relationships between legality and illegality, and the practices that allow this phenomenon to persist, can provide some analytical elements to come closer to a comprehension of this phenomenon. We will therefore try to show common elements of different supply chains of illicit goods in order to compare their functioning and composition.

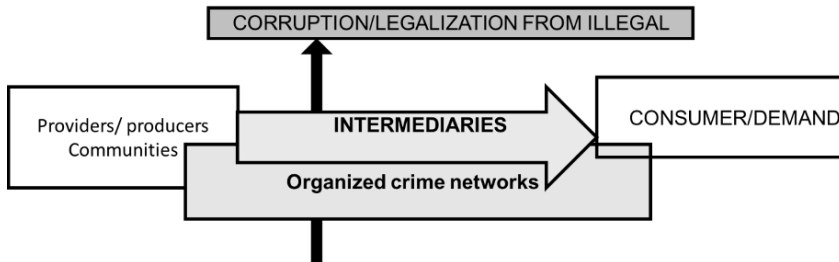
Illegal trafficking: common patterns

According to a UNEP (United Nations Environment Programme) report, approximately 30 % of the timber traded in the world is of illegal origin. In the same vein, WWF (2021) indicates that each year, approximately 100 tigers, 20,000 elephants and more than 1,000 rhinos are killed for trafficking in their bones, skin, tusks or horns. Moreover, an Athar Project (2019) investigation showed that almost two million people are members of groups on the social network Facebook that are dedicated to the illegal trafficking of cultural goods and antiquities, mostly from the Middle East. While these are different markets, with substantial differences in terms of

2 In the debate on the crime-terror nexus there have been identified operational dynamics with different levels of relationships, representing “activity appropriation” one of the lower levels (Dishman 2001) and pointing to the adoption of methods used by other criminal organizations.

processes, actors and methods, as well as consumers, it is worth analysing common elements that occur in the context of illegal trafficking.

Diagram 2: *Illegal trade process (author's design)*



An interesting case to review is wildlife trafficking, which is currently believed to be widely penetrated by organised crime groups (Wyatt, van Uhm and Nurse 2020). This is where an issue of interest to this study comes in: the convergence of various illegally trafficked products in certain organised groups. That is, certain actors (usually dedicated to drug or weapons trafficking) participate in the illegal trade of other products such as minerals, wildlife or timber, thus exploring new markets and with them new ways to make profits, reduce risks and exercise control over territories. An example is the case of gold exploitation in Colombia: the criminal infrastructure that organised crime groups have developed to exercise control over illegal drug plantations can easily be used for other activities and provide income for criminal actors when such an opportunity exists; hence these organisations develop a broad portfolio of criminal activities, increasing profits, expanding territorial control and managing similar dynamics with associated actors (Rettberg and Ortiz-Riomalo 2016). As for the trafficking of art and antiquities, close relationships of this market with other types of goods and products, such as drugs, have been mentioned. As Tjihuis (2006: 139) writes, first, “precious stolen works of art are supposedly used as collateral or means of payment in major drug deals”; second, “stolen art or looted antiquities are trafficked together with drugs from source to market country”; and third, “stolen art is thought to be used to launder proceeds from drug trafficking or other criminal activities”.

At the same time, it is important to note that illegal markets and crime dynamics highly depend on the context of each country regarding economic, legal and even cultural conditions, which impact on their configuration in some way or another. For example, the market conditions, the supply chains and the actor profiles are quite different in arms trade

and wildlife crime, but criminal actors might use similar tactics and instruments or even share hubs in certain moments and segments of their criminal activities. Also, violence and coercive methods as well as the structure of criminal networks in each country are diverse due to links with the global dimension/markets, which require specific ways of delivery and supply. Another fundamental issue is the role that the internet and social media are assuming in different shadow supply chains; electronic interactions have become a central platform for the transfer of goods, services and resources of illegal origin, demanding a new type of specialist skilled at internet marketing. For example, Mexican cartels and other criminal organisations used encrypted devices for their operational communications and international trade, which was uncovered in 2021 by the operation known as Trojan Shield that coordinated police agencies in 16 nations. More than 800 suspects were arrested, and more than 32 tonnes of drugs – including cocaine, cannabis, amphetamines and methamphetamines – were seized, along with 250 firearms, 55 luxury cars and more than US\$148 million in cash and cryptocurrencies (Davis 2021).

Conclusions: de-risking supply chains

Preventing supply chains from being undermined by criminal actors is one of the central challenges in developing greater robustness and operational resilience of the production networks. Research has shown that the disruption of supply chains is having major impacts on the economies of industrialised countries (Maihold and Mühlhöfer 2021); this finding shows that supply chains compromised by criminal interests are very difficult to recover for the legal actors involved without causing bottlenecks and economic costs for legal flows. Only through better risk management strategies at the company level, greater transparency and “know your customer/supplier” procedures in sourcing strategies can possible risks be minimised. As governments can support the efforts of companies by collecting and sharing information, the joint action of both levels of responsibility is an essential element of de-risking. But supply chains imply high levels of complexity, especially when different manufacturing stages and separate components are combined. For this reason, one approach has been that law enforcement agencies should focus on key or central nodes in the chain, which make the largest contribution to the criminal activities (Ballester, Calvó-Armengol and Zenou 2006), while other authors suggest targeting the most prominent criminals or emergent leaders or disrupting associated networks in order to eliminate their capability to

distribute goods and resources (e.g. in the case of precursors) (Carley, Lee and Krackhardt 2002). Generally, it can be assumed that the more complex the product, the higher the costs of transparency and effective traceability of the supply chain. For example, establishing redundancy as a strategy of resilience in shadow supply chains may appear easy, but the costs may expand considerably during execution. The need to identify additional channels and persons increases network communications, raises the network's visibility and makes it more vulnerable to interdiction by the authorities. Therefore, the expansion of the scope of interdiction is one of the challenges that authorities confront in their efforts to disrupt criminal networks and avoid rapid replacement of nodes and actors.

In the end, redundancy goes against one of the basic management paradigms of supply chains: efficiency. In order to achieve higher standards of safety and reduce risk factors, additional capital may be necessary to arrive at strong oversight with respect to the participating actors. Criminal strategies like shifts in the geography of production and transport in response to higher law enforcement capacities are one of the factors which can affect the entire supply chain and imply an internal reorganisation of the established links as well as a reconfiguration of the complete (even non-criminal) supply chain. But realising vulnerabilities due to criminal participation in supply chains is essential to risk management plans (including tools to monitor possible risks) that enterprises will have to establish. Therefore, the main pathway should lead to greater robustness of the supply chains, especially in certain vulnerable stages like transportation, repackaging, logistics etc. At the end of the day, all measures of surveillance and control can be summarised in two basic options: reducing the flows and increasing the costs. Both options have considerable effects also on the legal side in supply chains, due to the mixture of illicit actors in the supply chain who are difficult to identify and remove.

Analysing illegal markets reveals common patterns, in part because both routes and actors may either be interconnected or belong to different types or sectors of markets, with profit being their primary motivation. However, the different particularities of each market cannot be ignored and should be analysed in detail, as actors, roles and specialties that determine each supply chain in each market have specific characteristics. In this view, the convergence argument is valid in terms of activity appropriation in different shadow supply chains by criminal actors who try to cover different markets or market segments. Similarities and convergences are possible, maybe frequent, but this does not imply a general trend towards symbiotic relationships or even hybrid groups. An example of this is the antiquities trade, where actors in the final stages are people with highly

specialised knowledge about art, often specialists, historians and archaeologists, who are vital in the process in order to determine higher profit margins and interest in the products trafficked. In the case of trade in wildlife, antiquities and timber, the product is transformed as its value increases, and the actors gain as it moves toward the final consumer. This is one of the proofs that illegal markets are solid sources of income that provide incentives to stay in the market with specialised roles and profiles of actors and processes.

Finally, it is important to point out that governments and their legal systems and law enforcement agencies are determining factors in the existence and success of processes such as looting and illegal logging. Intermediaries play crucial roles at different levels, sometimes due to their weak capacities in the configuration of the chains, in other cases more prominent ones as brokers between important hubs for (il)legal markets. The weakness of some legal systems, in the face of which the methods and processes for concealing and transporting illegal goods continue to exist, is compounded by the lack of institutional interest in filling these gaps; the roots can be found in the profit obtained by those who participate in and facilitate the existence of shadow supply chains from their institutional positions. The efforts to de-risk have to extend from the company level to the final consumer, all along the supply chain, in order to reduce its “shadowy” segments.

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