

Structure of a Transnational Criminal Network: “Los Zetas” and the Smuggling of Hydrocarbons

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Disclaimer

The facts and the analysis presented herein are sustained in documents and interviews exposed in mass media and judicial records related to the criminals networks analyzed. No primary information uncovering facts has been gathered, which means that only secondary sources were consulted, from legal to media documents.

In the case of the names mentioned, quoted or referenced on indictments —with the exception of those specifically mentioned, quoted or referenced in the text as definitively condemned-, the presumption of innocence, in observance of individual rights is always preserved. The judicial truth is the jurisdiction of the courts, which by law will decide whether the defendants are innocent or guilty.¹

It is stated that *belonging to, participating in, being connected to, or appearing on* a network, as analyzed herein, does not imply having committed a criminal act or being engaged in a criminal enterprise. It is always possible to *belong, participate, be connected, or appear* on a network as an agent promoting interests that are socially and institutionally beneficial, or as a result of coercion, among other reasons unrelated to criminal acts committed by the agent.

¹ Based on: Francesco Forgione. *Mafia Export. Cómo la Ndrangheta, la Cosa Nostra y la Camorra han colonizado el mundo*. Anagrama. Crónicas. Barcelona, 2010, pgs.11-12.

Introduction

Mexico is currently one of the most important hotspots of criminal activity with effects in the Western Hemisphere. In this criminal dynamic, the Sinaloa Cartel, The Gulf Cartel, “La Familia Michoacana”, “The Knights Templar” and “Los Zetas” are some of the most relevant criminal networks that originated in Mexico, but currently reach and operate in different countries across Latin America, Europe, Africa, and Asia. While the operations of criminal networks inside of Mexico are severely violent, outside of Mexico their operations mainly consist of smuggling, transportation and distribution of illegal drugs, and other such activities. “Los Zetas”, initially created out of former elite army soldiers, was the armed wing of the criminal network known as the “Gulf Cartel” [Cartel del Golfo] at the beginning of the present century. However, very quickly “Los Zetas” began operating as an independent criminal network, currently challenging the Gulf Cartel for control of trafficking routes and “plazas”, meaning gaining local power in municipalities. Bearing this in mind, in this paper we present and discuss a model of a transnational criminal structure of “Los Zetas”.

The Network: “Los Zetas” and “La Familia”

In 2003 Mexican authorities imprisoned Osiel Cárdenas Guillén, leader of the Gulf Cartel, who was also in charge of creating “Los Zetas” at the end of the nineties. As a result, “Los Zetas” found an opportunity to take control of the routes and the infrastructure of the Gulf Cartel. Osiel Cárdenas was extradited to the United States in 2007, which then increased the confrontation between “Los Zetas” and the Gulf Cartel.

The current local control carried out by “Los Zetas” in Mexico, partially as a result of the confrontation with the “Gulf Cartel”, implies agreements with local authorities—this includes members of the municipal police, political leaders, and other public servants who provide access to decisions regarding the local public administration. Additionally, private agents establish agreements with criminal networks like “Los Zetas”, in order to participate in money laundering schemes. Similar agreements, which include the participation of politicians, public servants, and private agents, have also been observed in models of other criminal networks, such as “*La Familia Michoacana*” (Garay & Salcedo-Albaran, 2012a, 2012b).

In fact, another criminal network that is also highly relevant in the Mexican crime scene was formerly known as “La Familia Michoacana” [“Michoacana Family”], and is currently known as “Caballeros Templarios” [“Templar Knights”], after a confrontation between two leaders of the network: Servando Gómez Martínez aka “La Tuta” and José de Jesús Méndez Vargas aka “El Chango Méndez”.

Bearing in mind the current complex structure of the criminal networks operating across Central America and the United States, herein we analyze a model that includes information regarding the structure and operation of “*La Familia Michoacana*” and “Los Zetas”. These two criminal networks are articulated in the present model, sometimes through interactions of confrontation, and sometimes through collaboration.

While “Los Zetas” and “La Familia Michoana” both have great impact in the dynamics of crime in Mexico, “Los Zetas” as a whole network seems to have a stronger presence in various countries across Central America—not only as result of their drug trafficking, but also due to its participation in other criminal activities such as smuggling, extortion, and human trafficking, among others. For instance, criminal activity by “Los Zetas” has been registered in Nicaragua, Guatemala, El Salvador and Colombia (InSight Crime, 2011). As it is discussed below, the level of decentralization, which implies counting with operative units in different countries, is one the main reasons why “Los Zetas” is able to effectively operate across several criminal activities and markets.

The network analyzed in the present section, which includes interactions between members of “*La Familia Michoacana*”, “*Los Zetas*”, and the Gulf Cartel, consists of 552 interactions among 313 nodes/agents. The model is built on and supported by judicial records containing facts from 2002 to 2010. In this sense, the model reports facts regarding important changes observed in the crime dynamics of Mexico—for instance, the initial collaboration between the Gulf Cartel and “*Los Zetas*”, and the current cruel confrontation going on between “*Los Zetas*”, “*Los Caballeros Templarios*” and the Gulf Cartel.

Because of the quantity of nodes/agents² and interactions, the present network allows us to understand the relevant characteristics of both the evolution and the current operative structure of “*Los Zetas*”. This means that we analyze the present model of network as a single one, despite the fact it is sometimes possible to find subnetworks that are not directly articulated to the network as a whole.

The present network also illustrates the different types of interactions between “*Los Zetas*”, the Gulf Cartel, and “*La Familia Michoana*”. For instance, we can observe a trend in which drug trafficking networks take advantage of the already-established structures of interactions, in order to participate in other criminal markets and activities. Specifically, the present network is an example of how a drug trafficking network participates in the illegal extraction, transport, and smuggling of hydrocarbons.

² “Each point in a network, defined as a *node*, represents an individual or as it is referred here: an agent. An agent refers a moral agency unit; therefore, a node represents an individual agent or a collective agent, as a firm; however, the present analysis focuses on individual agents conforming a network. It will be used the concept node/agent when referencing each point in the networks analyzed herein” (Garay & Salcedo-Albaran, 2012b).

Smuggling of Hydrocarbons

In recent years, members of “Los Zetas” network have been engaged in other illegal markets and illegal activities that are not specifically related to drug trafficking. These include extortion, racketeering and, specifically, the smuggling of humans and natural resources. Bearing this in mind, a great portion of the network analyzed below is focused on the illegal extraction and smuggling of hydrocarbons that are the property of the National firm in charge of the domestic and international transport and trading of Mexican Oil [*Petróleos de México*, PEMEX].

The interactions in the present network are mainly established between *dark* nodes/agents defined as drug traffickers, and *gray* nodes/agents defined as public servants. However, as we will discuss, we can also observe the participation of private nodes/agents, specifically (i) carrying out the money laundering processes that are executed within the financial structure of the network, as well as (ii) buying trafficked hydrocarbons inside the United States.

The present network is, therefore, an interesting example of how public and private nodes/agents co-opt and are co-opted by criminal nodes/agents, in order to accomplish unlawful purposes. In this way, the present network is similar to other cases that have already been analyzed regarding Mexican crime (Garay & Salcedo-Albaran, 2012a and 2012b), such as “*La Familia Michoacana*”, where almost the entire network is articulated by nodes/agents classified as public servants and drug traffickers.

Among those *gray* nodes/agents in which the organizational and the institutional role do not coincide,³ one of the most interesting is Miguel Ángel Almaraz Maldonado, due to his high exposure in the Mexican national media. because of his role as Former director of the Party of the Democratic Revolution [*Partido de la Revolución Democrática, PRD*] in the State of Tamaulipas between 2005 and 2007 (Guzmán & Gastón, 2009). The case of Almaraz, identified in the present network with the code FUPBL-VIALOZEMNAM, gained the attention of the Mexican national media after being captured in 2009 for participating in a massive criminal network of hydrocarbons trafficking. In fact, in the context of the present network, Almaraz was in charge of “*directing and administrating the activities of other members of the criminal network who were also under prosecution*” by Mexican authorities. Additionally, members of the present criminal network also engage in money laundering as a result of the drugs and hydrocarbons trafficking. This means that in the present network, criminal activities were registered that included drug trafficking, hydrocarbons trafficking, and money laundering, as well as several violent criminal activities.

³ a. *The lawful agent (bright)* is that agent who belongs to a lawful organization and plays a lawful functional/institutional role. b. *The unlawful agent (dark)* is that agent who belongs to an unlawful organization and plays an unlawful functional/institutional role. This agent not only obstructs compliance with the lawful functional/institutional role or openly promotes its non-compliance, but also contributes to compliance with the unlawful functional/institutional role. c. *The undefined agent (grey)* is the agent whose exercised functions do not fall under either situation a) or b). An example of undefined agent (grey) is the “traffic officer” who, while belonging to a lawful organization, obstructs compliance with traffic law.

Regarding the drug trafficking activity, which continues to be a relevant activity of “Los Zetas” network, Osiel Cárdenas Guillén, a former lord of the Gulf Cartel, appears to be in charge of making the most important decisions related to transporting the illegal drugs across Mexico and towards the United States. As discussed below, this node/agent is highly relevant for the articulation of the Gulf Cartel and “Los Zetas”. Initially, Osiel Cárdenas Guillén was in charge of creating “Los Zetas” to reinforce the Gulf Cartel’s military strength. Then, even after being extradited to the United States, Osiel Cárdenas continued to act as a relevant node/agent in the confrontation of both criminal networks, since “Los Zetas” constantly pointed out that Osiel Cárdenas was providing information to the United States authorities regarding the structure and inner operation of “Los Zetas”.

Another relevant drug trafficker in the present network is Roberto Rodríguez Cárdenas, who operated in Guatemala. Specially, this node/agent participated in the mass murder registered in Guatemala at the tourist place known as “La Laguna”, in 2008, which called the attention of national media at Guatemala. In fact, Guatemalan courts sentenced 14 members of “Los Zetas” in 2010 for their participation in the mass murder (Prensa Libre, 2010). This node/agent is highly relevant for evidencing the articulation and operation of members of “Los Zetas” across Mexico and Guatemala. In this sense, the present network also illustrates a remarkable transnational dimension, with permanent and non-sporadic activity in various countries of Central and South America.

Concentration of interactions

The drug trafficker Osiel Cárdenas Guillén, original member of the Gulf Cartel [*Cartel del Golfo*], identified with the code NA-LICADEGOOCRGN, registers the highest amount of direct interactions, with a direct centrality indicator of 4,2%. In the present network, which includes facts from the period when “Los Zetas” operated as the armed wing of the Gulf Cartel, Osiel Cárdenas Guillén is the hub. Osiel Cárdenas interacted with several hitmen operating as members of “Los Zetas”, providing them instructions for homicides. Some of the nodes/agents executing the orders of Osiel Cárdenas were: (i) Gonzalo Gerenzano Escribano, identified with the code SI-LOZEGGE, (ii) Isidro Lara Florez aka “El Colchón”, identified with the code SI-LOZEILFECN, (iii) José Ramón Dávila López aka “El Cholo”, identified with the code SI-LOZEJRNDVLPEC, and (iv) Héctor Manuel Saucedá Gamboa aka “El Caris”, identified with the code NA-LOZEHCMMSGEC (Graph 1).

Even after being imprisoned by Mexican authorities in 2003, and extradited to the United States in 2007, Osiel Cárdenas Guillén currently remains as a relevant node/agent in the recent drug trafficking scenario at Mexico. For instance, in 2012 “Los Zetas” accused Osiel Cárdenas Guillén of providing information to the DEA regarding their activity. “Los Zetas” even pointed out that Osiel Cárdenas provided information for operations to be executed by the Gulf Cartel and “Los Caballeros Templarios” against “Los Zetas” (Revista Proceso, 2012).

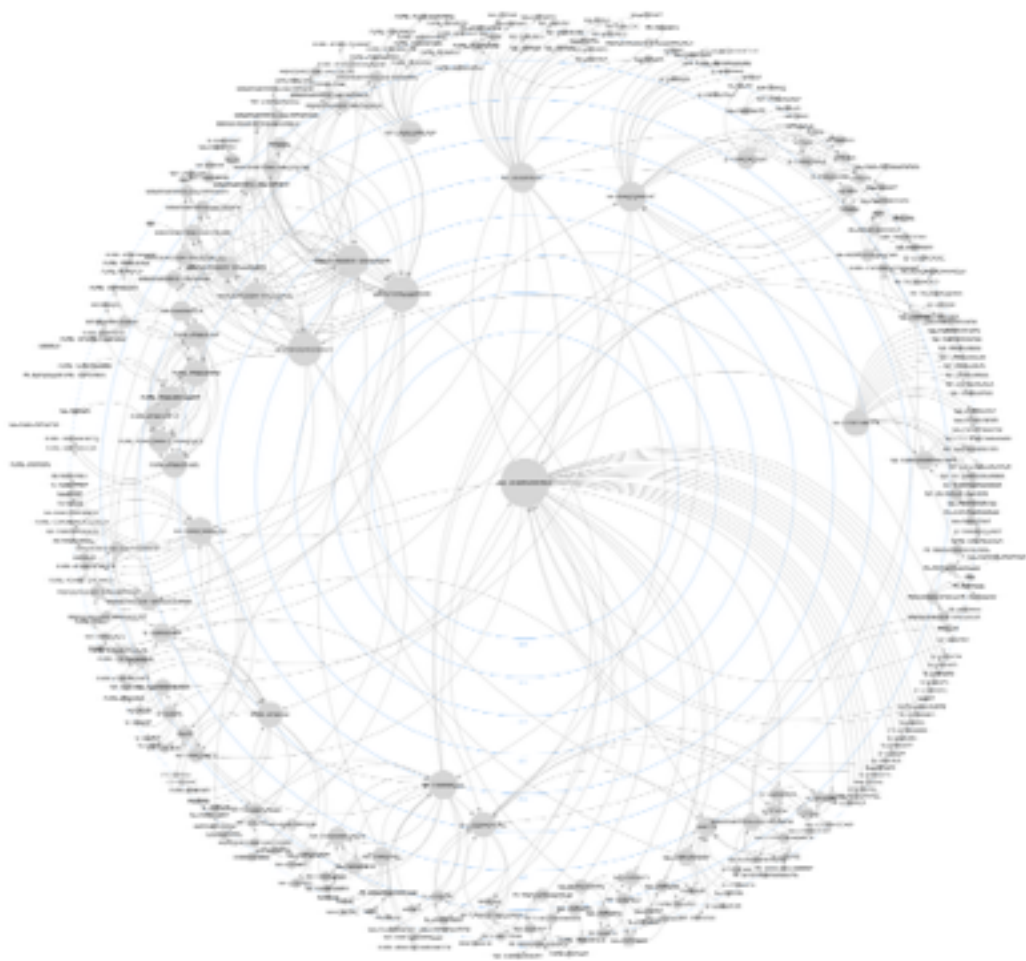
The second node/agent with the highest capacity to establish direct interactions in the network is a political leader with a high public profile: Miguel Ángel Almaraz Maldonado, identified by the code LDEPOTIVIALOZEMNAM. This node/agent registers a direct centrality indicator of 3.1% and participates in interactions specifically related to the financial structure of the most recent criminal structure of “Los Zetas”. In fact, Almaraz Maldonado is one of the most relevant nodes/agents articulating the entire financial and operative structure of the sub-network in charge of the illegal extraction of hydrocarbons. For instance, Almaraz participates in interactions consisting of bribing public servants for transportation of the stolen hydrocarbons, as well as renting the trucks used for that purpose. This is, therefore, a highly relevant gray node/agent who establishes interactions across both the lawful and unlawful sections of the network.

The third node/agent with the highest capacity to establish interactions is PR-MIBADEARODEHIJVV, a private node/agent in charge of opening and managing various bank accounts that were used for massive money laundering processes. This node/agent registers a direct centrality indicator of 2.7%, and configures a relevant triad between the political, private, and criminal sections of the network. This means that the three nodes/agents described above allow for the flow of criminal, political, and financial resources and information. In this sense, the fact that “Los Zetas” are able to operate in the stealing, transportation, and smuggling of hydrocarbons, is the result of their capacity to effectively establish interactions with grey nodes/agents operating within lawful institutions, such as political parties and financial institutions.

The three nodes/agents mentioned above have similar levels of relevance in the articulation of the network: 4.2%, 3.1%, and 2.7%. The establishment of direct interactions is not highly concentrated in just a few nodes/agents, which means that the network is highly resilient in terms of the structure of interactions. On the other hand, as it is discussed below, three nodes/agents control the capacity to arbitrate information and intervene in the geodesic routes of indirect relationships.⁴ This means that the capacity to intervene and arbitrate in the geodesic routes of the network is more concentrated than the capacity to interact in a direct way.

⁴ A Geodesic route is the path that connects two nodes/agents even if they are not directly connected. Therefore, the geodesic are the routes in which every couple of nodes/agents are connected through the intervention of additional nodes/agents.

Graph 1. Radial distribution. Location (higher in the nucleus) and size illustrate the *direct centrality degree* (amount of direct interactions)



Concentration of capacity for arbitrating information

The drug trafficker Osiel Cárdenas Guillén, one of the original members of the Gulf Cartel when “Los Zetas” operated as its armed group, and described in the previous section as the hub with the highest indicator of direct centrality, is also the structural bridge with the highest indicator of betweenness. Therefore, this node/agent has the highest capacity to arbitrate information and intervene in the flows of information or geodesic routes of the entire network, with a betweenness indicator of 13.9% (Graph 2).

Two nodes/agents register the second highest indicator of betweenness. On one hand, the drug trafficker Omar Lormendez Pitalúa aka "El Pita", identified with the code SI-LOZEOLPAEP, registers a betweenness indicator of 8.9%. This node/agent is a murderer (hitman) that provides relevant information regarding the inner structure of "Los Zetas", including various homicides committed in the context of the criminal network. "El Pita" is also in charge of establishing interactions with public servants, such as a member of the local police at the municipality of Lázaro Cárdenas and Petacalco, in the State of Guerrero. It is therefore interesting to learn how a "hitman" who directly ordered and executed homicides, was also able to establish interactions with public servants, in order to obtain protection and information from the local police. This situation explains how even a node/agent participating in the sub-networks in charge of executing violence, registers also high indicator of betweenness. Also, "El Pita" established interactions with "La Tuta", one of the most important leaders of "*La Familia Michoacana*", which also explains his role as a relevant structural bridge that connects sub-networks—not only inside the criminal network of "Los Zetas", but also with other criminal networks such as "*La Familia Michoacana*".

On the other hand, Miguel Ángel Almaráz Maldonado, identified with the code LDEPOTIVIALOZEMNAM, also registers a betweenness indicator of 8.9%. This capacity is explained because Almaraz Maldonado operates from a private role with access to information from the political and private spheres, as well as the local public administration. Almaraz Maldonado connects lawful and unlawful structures inside the network.

The third highest indicator is registered by NA-FAMISGMMNLTEP, code that identifies the drug trafficker Servando Gómez Martínez aka "La Tuta" ó "El Profe". This node/agent registers an indicator of 8.2%, which is explained by his operating role inside the criminal network of "La Familia". His interactions with members of other criminal networks, such as the meetings with "El Pita", allow us to understand his capacity to arbitrate information across sub-networks. In fact, "La Tuta" has been described as the node/agent with the highest amount of direct centrality when "*La Familia Michoacana*" has been analyzed as a single structure (Garay & Salcedo-Albaran, 2012b).

The first 20 nodes/agents with the highest capacity to intervene in the routes of information, including the three described above, register a betweenness indicator higher than 1%. This shows their capacity for arbitrating information between other nodes/agents, and even in some cases, for operating as structural bridges between sub-networks, such as the first four nodes/agents described above. Among the group of the 20 nodes/agents with the highest indicator of betweenness, only the twelfth is a public servant, identified as aka "Karen". This node/agent, who is not referenced in the sources with a real name, was a local police officer that collaborated with "Los Zetas"—not only providing information or security, which is usually observed when members of the local police collaborate with criminal networks in Mexico—but also packing loads of illegal drugs to get them ready for local and international distribution.

“Karen” is an interesting case of institutional co-optation carried out by “Los Zetas”. Although this node/agent was a member of the local police, it is also counted in the judicial records as part of the criminal network of “Los Zetas”. In fact, “Karen” also provides relevant information regarding the operative structure of the network, specifically about other public officials of the local police who, while on duty, were also active members of “Los Zetas”. For instance, “Karen” explains that he began working with ‘Los Zetas’ because his official commander at the municipal police offered him the task of taking care of the cars used for transporting illegal drugs and money from and to Nuevo Laredo”. When “Karen” began working with “Los Zetas”, he received a payment of US\$ \$300 every two weeks. “Karen” explains that, at that moment, another police commander from the Operative Police Group [*Grupo Operativo Policiaco*, GOP] was in charge of paying him for his services. In this sense, “Karen” is registered as the node/agent with the twelfth highest betweenness indicator because of his capacity for participating in various interactions between nodes/agents that operated inside the local police, while providing support for “Los Zetas”. In total, thirteen out of the 313 nodes/agents of the network belong to the local police.

Graph 2. Radial distribution. Location (higher in the nucleus) and size illustrate the *betweenness* indicator (capacity for intervening in the routes of information)



Interactions

The total amount of interactions modeled in the present network is 552. The most important type registered 17% out of total interactions, which describes the inner operative and command structure of “Los Zetas” that participated in the network, specifically related to drug trafficking, which is illustrated in the graph below (Graph 3). Therefore, those nodes/agents participating in interactions of the “command structure” can be defined as members of “Los Zetas”, specifically participating in activities related to drug trafficking.

It is important to bear in mind that there is another category of interactions that also belongs to “Los Zetas”, but specifically related to oil and hydrocarbons smuggling. This structure is, therefore, also part of “Los Zetas”, but not related to drug trafficking; but rather, in charge of executing the illegal activities of stealing hydrocarbons inside of Mexico, transporting it, and smuggling it into the United States. Those activities modeled in the present network are built on facts dated from 2006 to 2009.

Graph 3. Interaction 1. Inner command structure of “Los Zetas”, specifically related with drug trafficking. Location (higher in the nucleus) and size illustrate the *betweenness* indicator (capacity for intervening in the routes of information).

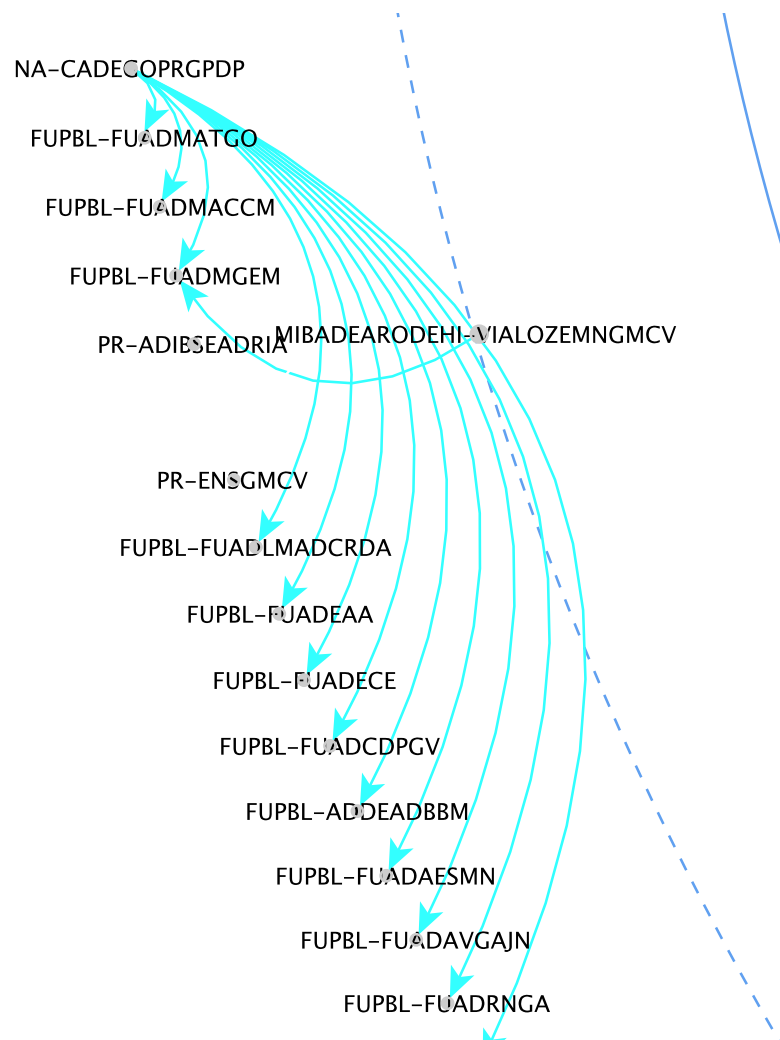


Even though the structure responsible for executing the hydrocarbons smuggling is not as important in terms of the amount of interactions, as the one responsible for drug trafficking, it is the sixth highest type of interactions in the network, accounting for 6% out of the total amount. The type of interaction “Oil Traffick – inner structure” is relevant because it illustrates the complexity of the sub-network that is focused on this activity. For instance, several private nodes/agents participate in this structure, operating through firms that transport and distribute oil and hydrocarbons inside the United States. Also, the participation of nodes/agents who are part of “Los Zetas”, operating within financial institutions in charge of carrying out the money laundering process, as well as officials operating through Mexican customs agencies, were registered in the network. The graph below (Graph 4) illustrates the structure of those specific interactions that were established with customs officials inside Mexico.

Graph 4. Joint operation with customs official. Location (higher in the nucleus) and size illustrate the *betweenness* indicator (capacity for intervening in the routes of information).



Graph 5. Joint operation with customs official (Sub-network)



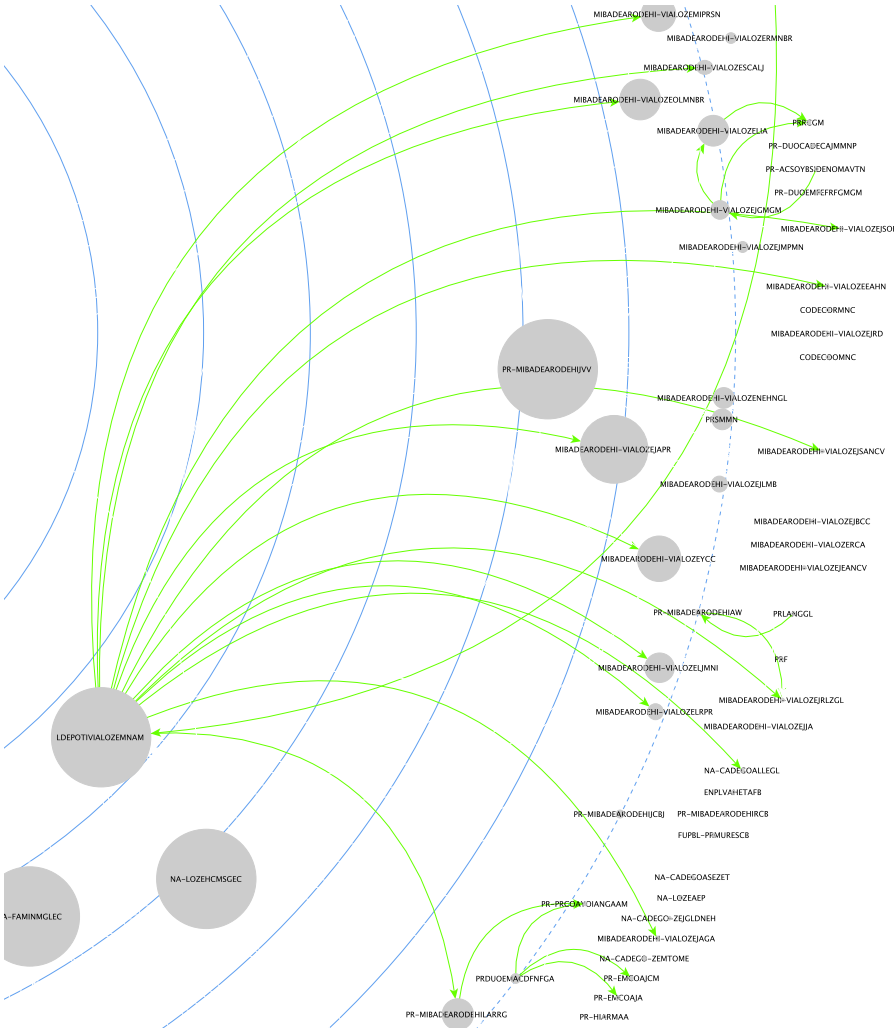
Bearing in mind that oil and hydrocarbons are smuggled inside the United States, we would also expect to see participation of officials operating inside the customs agencies of the United States. However, since the judicial sources sustaining the present networks belong to Mexican authorities, there is no specific information regarding the participation and/or interaction with officials operating inside the United States. This means that according to the sources, all the customs officials collaborating with the criminal objectives of the network were Mexicans. Therefore, it is still important to gather information originated at the courts and security agencies inside the United States, since it is also importante to understand the rol of the border patrol.

In fact, there is a reference to United States Immigration and Customs Enforcement (ICE) officials, explaining how the ICE gathered intelligence regarding the operation of the smuggling network, and specifically, in regards to the firms that bought the trafficked loads of hydrocarbons inside the United States. In this sense, according to the information, the ICE officials provided useful information to Mexican authorities for identifying the American firms collaborating with the smuggling structure of “Los Zetas”. According to that information, those firms buying hydrocarbon condensate inside the United States paid about USD\$800.000 for each load.

Graph 6. Interaction 6. Hydrocarbons smuggling structure. Location (higher in the nucleus) and size illustrate the *betweenness* indicator (capacity for intervening in the routes of information)

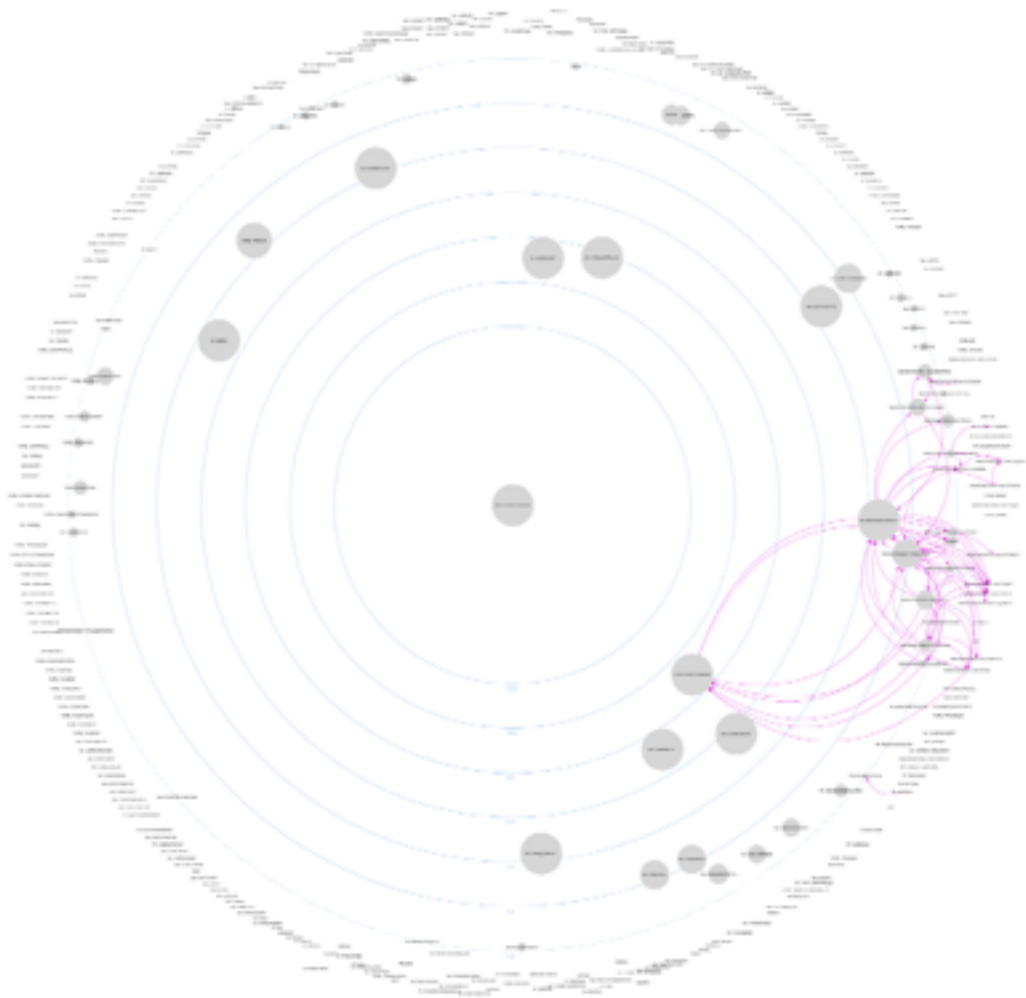


Graph 7. Interaction 6. Hydrocarbons smuggling structure (Sub-network)

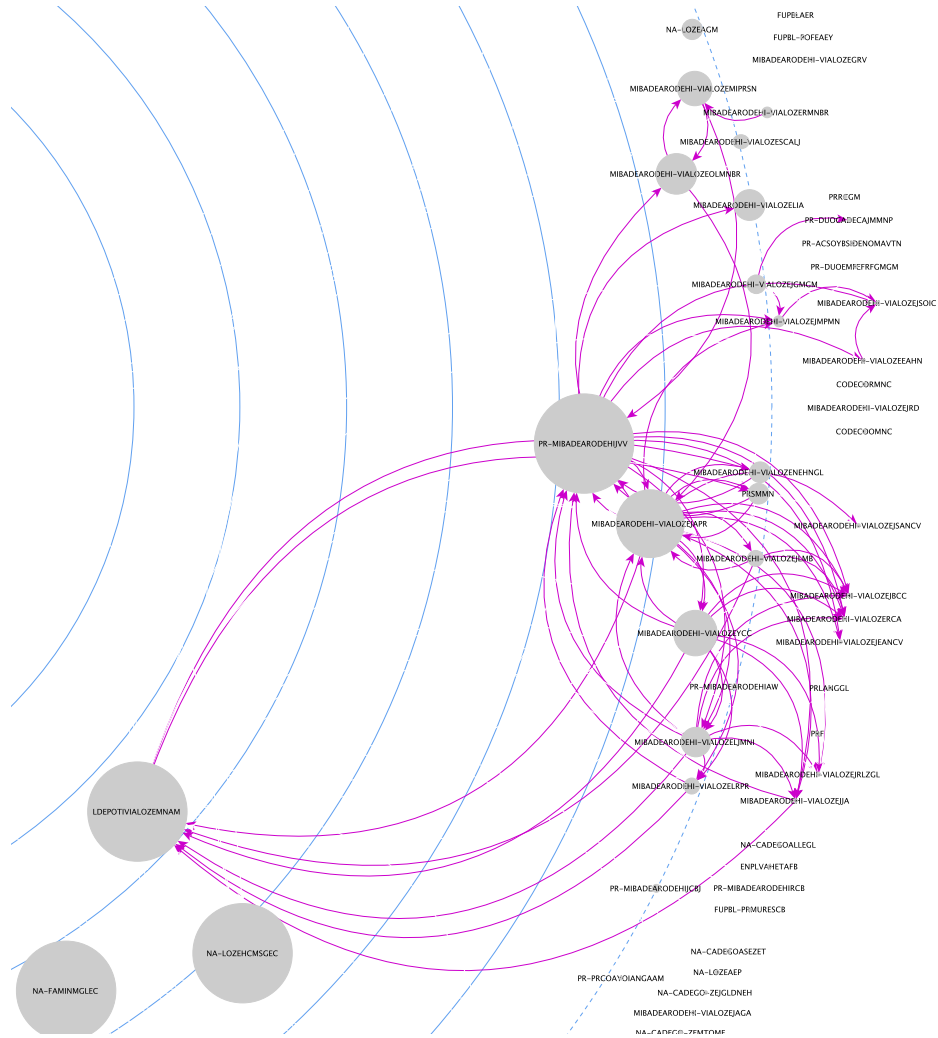


The second type of interaction with the highest concentration, 14%, is related to the money laundering process carried out by the criminal network, specifically the transfer of money between accounts, which is a financial procedure for evading currency controls between Mexico and the United States. The structure focused on money laundering, which is illustrated in the graph below (Graph 8), supported the drug trafficking and oil smuggling sub-networks. The fact that this type of interaction registers as the second highest percentage of relevance, allows us to infer that money laundering was a highly relevant process carried out in this network.

Graph 8. Structure of Money laundering consisting on wire transfers. Location (higher in the nucleus) and size illustrate the *betweenness* indicator (capacity for intervening in the routes of information)



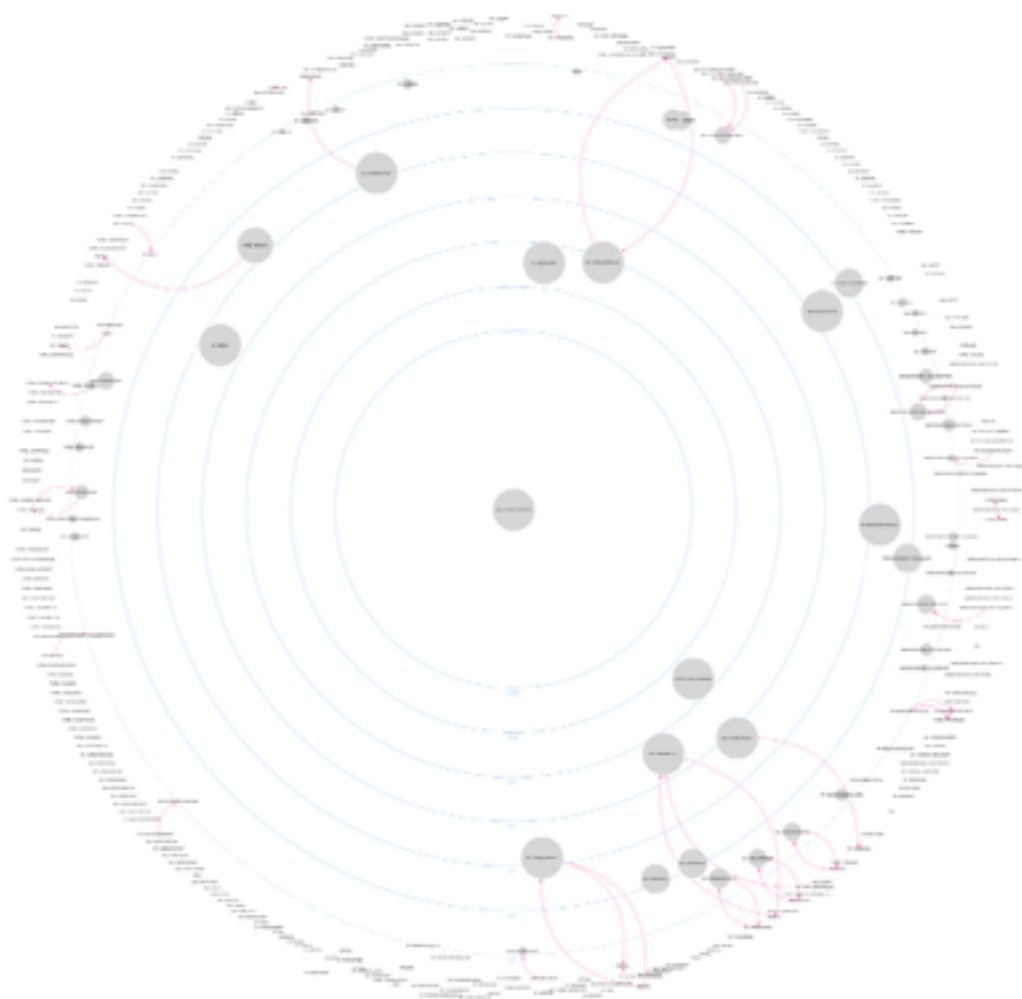
Graph 9. Structure of Money laundering consisting on wire transfers (Sub-network).



The third most relevant type of interaction, with 8%, consists of those in which a node/agent A points out that he “knows something” about a node/agent B, or that simply “knows the” node/agent B. This type of interaction includes all those psychological ties in which someone has information about someone, and does not include situations in which the nodes/agents directly participate in the operative structure of the network; however, this type of interaction provides information regarding all those nodes/agents that directly or indirectly have participated in different processes carried out in the context of the network.

The fourth most relevant type interaction, with 7%, is the one built on family ties. As it can be observed, this type of interaction is distributed across the network, which means it is not specifically related with a single sub-network (Graph 13) such as “*La Familia Michoacana*” or “Los Zetas”. Finally, the fifth most relevant type of interaction, with 6%, describes the command structure of the criminal network of “*La Familia Michoacana*”. Therefore, those nodes/agents participating in the fifth type of interaction can be defined as direct members of “La Familia” (Graph 14).

Graph 10. Family structure. Location (higher in the nucleus) and size illustrate the *betweenness* indicator (capacity for intervening in the routes of information)



Graph 11. “Michoacana” Family. Location (higher in the nucleus) and size illustrate the *betweenness* indicator (capacity for intervening in the routes of information)



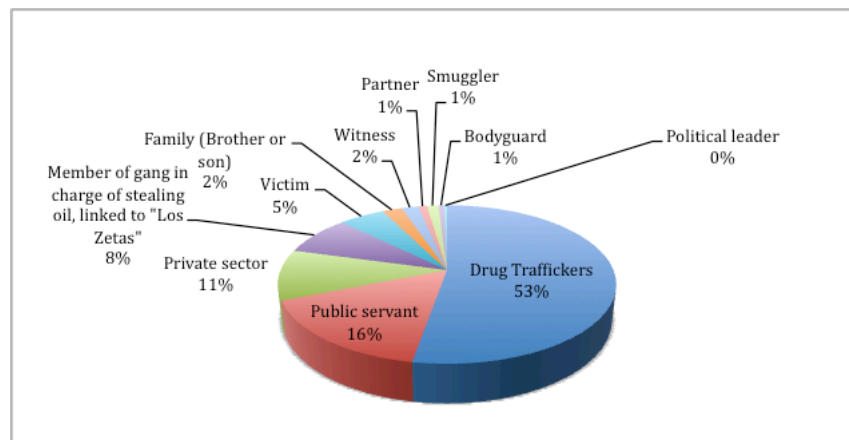
In general, the criminal network analyzed herein can be characterized as a highly resilient network, as a result of a low level of centralization. On one hand, the concentration of direct interactions, analyzed through the indicator of direct centrality, homogeneously decreases across the entire network, with no significant percent distance among nodes/agents. In fact, the greatest distance in terms of concentration of direct centrality is only 1%, between the first and the second nodes/agents with the highest indicator.

On the other hand, the concentration of the capacity for intervening in the routes of information, analyzed through the indicator of betweenness, illustrates a situation of higher concentration, when compared to the indicator of direct centrality. However, the level of centralization regarding the betweenness indicator is still low when compared with other criminal networks (Garay & Salcedo-Albaran, 2012). This means that the network is highly resilient in terms of the structure of direct interactions, and is less resilient in terms of the concentration of information. In any case, the network is resilient, which means that it would be necessary to remove or neutralize several nodes/agents, simultaneously, in order to achieve disarticulation of the network or to affect the structure of direct interactions.

Concentration of nodes/agents

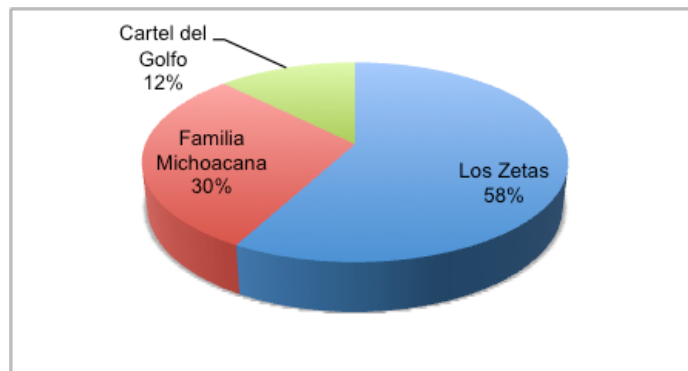
As we explained at the beginning of the present chapter, the analyzed model is composed mainly of drug traffickers and public servants. After categorizing and calculating the percent concentrations of nodes/agents, we found that the most important type is “drug traffickers” with 53%, followed by “public servants” with 16% (Figure 1). This means that 69% of all the nodes/agents interacting in the entire network are drug traffickers –meaning direct members of “Los Zetas”, “La Familia Michoacana” or the Gulf Cartel– and public servants. The same high degree of relevance of drug traffickers and public servants has been observed in other criminal networks analyzed in Mexico, such as in the case of “La Familia Michoanica” network, in which 67% out of the total amount of nodes/agents were drug traffickers, and 27% were public servants (Garay, Salcedo-Albarán, & De León-Beltrán, 2010).

Figure 1. Concentration of 313 Nodes/agents



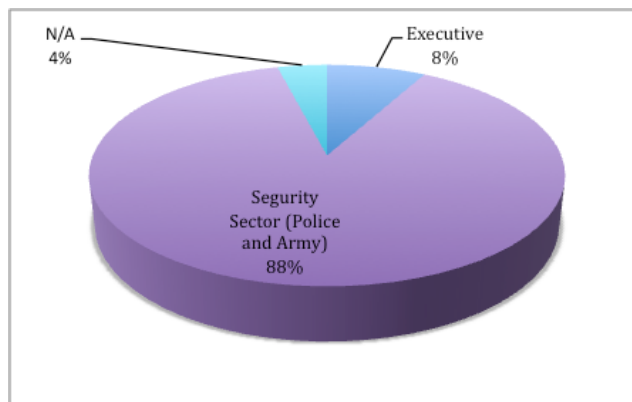
When analyzing the nodes/agents categorized as “drug-traffickers”, we identified those that belonged to “Los Zetas”, to “La Familia Michoacana”, or to “the Gulf Cartel”. Regarding those concentrations, it is important to call attention to the number of the members of “Los Zetas” (Figure 2) participation in the network.

Figure 2. Concentration of “drug/traffickers” of the network



Finally, bearing in mind the importance of the public servants in this network, the following are the concentrations of the 50 nodes/agents classified under this category (Figure 3).

Figure 3. Concentration of “public servants” participating in of the network



In total, 44 nodes/agents were classified as operating within the security sector, which includes the police –at the national, state and municipal levels–, the Army, the customs agency, and the Border Patrol of Mexico. Table 1 below illustrates the relevant participation of customs officials and the municipal police. In total, 12 Mexican customs officials participated in the network, representing the 25% of all the public servants participating in the network. According to the information provided by witnesses and former members of “Los Zetas”, those customs officials received a monthly payment, in cash, by “Los Zetas”, in exchange for allowing the transportation of loads of illegal drugs and hydrocarbons. The following is the complete list of those nodes/agents classified in this sector.

Table 1

Type of node/agent	%
Customs official	25
Municipal Policeman	11
Municipal Policeman at Hidalgo City, Michoacán, who collaborates with "Familia Michoacana")	7
Federal Policeman	7
Commander at Municipal Police	7
Second Rank Municipal Police	5
Municipal Policeman at Zitacuaro City, Michoacán, who collaborates with "Familia Michoacana".	7
Supervisor, Municipal police	2
Army Soldier	2
Municipal policeman at Zitacuaro City and Hidalgo City	2
Municipal Policeman at Zitacuaro City, Michoacán.	2
Municipal policeman at Hidalgo City	2
Ministerial Policeman	2
Federal policeman who collaborates with "Familia Michoacana"	2
Policeman	2
Officer of Public Security at Hidalgo city, Michoacán	2
Operative Police Group (<i>Grupo Operativo Policiaco</i>)	2
Director of State Public Security	2
Coordinator of Municipal Police	2
Commander of Operative Police Group (<i>Grupo Operativo Policiaco</i>)	2
Administrative Customs official	2

Conclusion: Complexity, Resilience and Diversification

The present model exemplifies various characteristics of current criminal networks operating across the Western Hemisphere, specially in the region of Central America. Some of those characteristics are:

- (i) The capacity to operate across borders.
- (ii) The capacity to sometimes cooperate with and other times confront other criminal networks.
- (iii) The process in which a subnetwork becomes an autonomous network - such as the case of “Los Zetas” being an initial subnetwork of the Gulf Cartel, and then becoming an autonomous subnetwork that confronted the Gulf Cartel.

However, the present case specially illustrates the capacity of current criminal networks around the world to progressively participate in criminal activities different to those in which the network initially participated, therefore improving the presence and operation of the networks in more regions and activities.

For instance, “Los Zetas” has been usually known as a Mexican drug trafficking organization, but this network has been progressively operating in territories beyond Mexico and activities beyond drug trafficking. In this sense, its consolidation of territorial presence across Mexico and surrounding countries, through bribes, coercion and co-optation, and its participation in different activities, not specifically related to drug trafficking, lead to more complexity, diversification and resilience of the network.

On the other hand, the level of decentralization, consisting on the fact that in this network the capacity of decision is not concentrated in a single node/agent, has already been pointed out as a characteristic associated with the high level of resilience. It would be therefore important to also point out the diversification of the types of criminal activities as another factor associated with the high level of resilience: Additional criminal activities require the establishment of additional subnetworks, which improves the level of decentralization and therefore the level of resilience.

“Los Zetas” is a complex network because it integrates high quantities of members in different countries, who establish also high quantities of interactions. During the last years this capacity, has resulted in enough strength to participate in activities such as kidnapping, racketeering and trafficking of humans and hydrocarbons, among others, generating a decentralized structure, different to the one observed in the Colombian drug trafficking Cartels during the nineties. This complexity of the amount and types of nodes/agents and interactions is progressively related with more complexity in terms of amount and types of activities.

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