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Human Trafficking Networks: A Case from Bulgaria

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Georgi Petrunov
Nikolay Yanev
Eduardo Salcedo-Albarán
(Authors and Researchers)

Luis Jorge Garay Salamanca
(Scientific Director)

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Scientific Director
Luis Jorge Garay

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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 criminal 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.

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Trafficking in Human Beings ("THB") for sexual exploitation is a modern form of slavery that happens in poor and wealthy countries: Usually poor countries provide the trafficked victims while the consumers and financial resources that sustain this activity are located in wealthy countries. The fact that humans are trafficked and sometimes enslaved in this criminal market generates perverse damages that are not observed in other forms of global trafficking.

For various reasons explained in the previous documents, such as the geographical location, the intense criminal and corrupt activity, and the economic pressures on the low-income population, Bulgaria is a hotspot for Trafficking in Human Beings ("THB") for sexual exploitation. Bearing this in mind, this document is the analysis of the structure a complex criminal network that trafficked women from Bulgaria to wealthy countries in the European Union. Two situations characterize the criminal structure analyzed herein: The fact that the "leader" of the criminal network was a public servant and the high amount of identified victims.

This document has 4 parts. In the first part the methodology and concepts related to Social Network Analysis are presented. In the second part the case and the sources gathered and processed in this analysis are discusses. The third part includes the characteristics of the criminal structure: The types of nodes/agents, the interactions established and the nodes/agents concentrating direct interactions and the capacity to arbitrate resources. In the last part conclusions are presented and discussed.

1. Methodology and basic concepts

Social Network Analysis

Social Network Analysis (SNA) is a collection of procedures that facilitates an understanding of interactions among individuals or groups. In the present paper, SNA was used to illustrate how social agents interacted over a period of time in order to accomplish criminal objectives.

The social agents participating in the present network were classified through categories generated according to the analyzed information. On the other hand, the interactions established by those social agents were classified under three main categories or dimensions: (i) Economic interactions, which groups subcategories consisting of the physical movement of money and financial transactions, (ii) political interactions, which groups interactions established *with* and *among* political leaders, candidates and some

officials, and (iii) violent and coercive interactions. Although interactions can be usually classified under any of these categories, there are cases in which additional categories must be applied. SNA allows interactions established by various types of social agents to be illustrated and analyzed, rather than just shown in a traditional hierarchy.

Through algorithms, SNA allows the relevant agents intervening in the network, the sub-networks, the emerging structures, the types of social agents and the types of relationships to be identified and highlighted. In the present analysis, the "relevant" social agents are (i) the 'hub' of the network, on which direct interactions are concentrated, and (ii) the structural bridge with the greatest capacity to arbitrate among the flows of resources and information. Due to the possibilities of analysis and visualization, SNA has been used to analyze the structure and characteristics of illicit networks (Morselli, 2008; Johnson, Reitzel, Norwood, McCoy, Cummings, & Tate, 2013; Radil, Flint, & Tita, 2010).

The Graph

The criminal situation analyzed in this paper requires interactions of collaboration or confrontation; therefore, it can be analyzed as a social network: "*Social networks can be defined as 'a group of collaborating (and/or competing) entities that are related to each other"* (den Bossche & Segers, 2013, p. 39). Social networks are analyzed through *nodes* that represent individuals and *lines* or *arcs* that represent the interactions or ties. Therefore, "*(…) a network is defined as a set of nodes connected by ties*" (Worrell, Wasko, & Johnstn, 2013, p. 128).

The present case was modeled through a technology of analysis and graphing developed by Scientific Vortex Incorporated. The technology, consisting of protocols for processing, categorizing and analyzing information, generates a database of nodes and interactions. This database allows subsequently analyzing information and characteristics related to specific nodes or interactions.

The first protocol for analyzing the sources of information, consists of identifying "relationships" or "interactions" between two agents, according to the following grammar structure:

[[Name Actor 1[Description Actor 1]][interaction[verb word ∧ action word]] [[Name Actor 2[Description Actor 2]]]

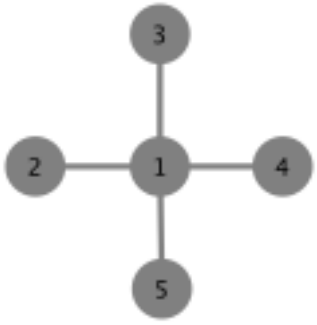
Each section of this grammar structure is included and processed in the system, through specific protocols that consolidate the mentioned database. The database is then analyzed through additional protocols to generate SNA graphs like the ones presented below, and to calculate and identify the centrality of each node.

In the present analysis each node represents a social agent; therefore, the concept of "node/agent" is used to identify each individual or corporation participating in the network. As previously stated, each line connecting two nodes represents a social interaction. Also, the arrow in the line represents the specific direction of that interaction: "For instance, if the node/agent X interacts *with*/*to* node/agent Z, then there is an arrow from a node representing X to a node representing Z." (Salcedo-Albaran, Goga, & Goredema, 2014).

Indicators of Direct Centrality and Betweenness

Regarding the "centrality" of a node/agent, it is important to differentiate two meanings of centrality: The most connected node/agent or the node/agent with the highest capacity to intervene in the routes of the network. On the one hand, the direct centrality indicator allows identifying the amount of direct interactions established by each node/agent. For instance, in the figure 0 the node/agent 1 has 4 direct interactions, while the nodes 2, 3, 4 and 5 only have one direct interaction with the node 1. Since there is a total of 8 total interactions, the node/agent 1 concentrates 50% (4) of the total direct interactions, the nodes/agents 2, 3 and 4 concentrate 12,5%. In this situation, the node/agent 1 is the hub of graph 1, because it registers the highest direct centrality indicator.

Figure 0. Example of a graph with 5 nodes/agents interacting



The second meaning of "centrality" allows identifying the node/agent with the highest capacity to arbitrate or intervene in the geodesic routes of the network, known as "the

structural bridge". While in graph 1 there are only 4 direct interactions, there is a higher amount of geodesic routes, which are the paths that indirectly connect all the nodes/agents. For instance, there is a geodesic route connecting the nodes 2 and 3 through the node 1, and there is another geodesic route connecting nodes 2 and 4 also through node 1, etc. Those geodesic routes are, therefore, represent the paths of information and resources that flow across the network.

After calculating the total amount of geodesic routes connecting the nodes/agents of the network, it is possible to identify through the betweenness indicator the node/agent with the highest capacity to intervene in those geodesic routes. As it can be observed in graph 1, the node 1 intervenes in every route of the network because there is not a single path that doesn't go through the node/agent 1, therefore it registers a betweenness indicator of 100%.

2. Description of the case

The criminal network in question began its existence in the mid-nineties of the XX century. At that time nodes/agents identified herein with the codes LEOFORCRGRIS and LEOFORCRGRVD, leaders of the criminal group, established a joint trafficking enterprise for sexual exploitation, first in Bulgaria and then abroad. From the very beginning the node/agent ASOFTHLEVZ was involved as a direct subordinate of the initiators. He was a former colleague of LEOFORCRGRIS, while both of them served in the same special police unit. In a short time LEOFORCRGRIS became the leader of a vast criminal network, engaged in Trafficking in Human Beings ("THB") for sexual exploitation. His position was later strengthened when he split with his associate, LEOFORCRGRVD, because of an unresolved dispute over the sharing of profits. The latter left the criminal organization, although kept trying to interfere in its affairs whenever changes in the internal balance of power allowed for it.

The criminal network controlled victims who were exploited in open public spaces such as streets, but also sex workers engaged in erotic bars, clubs or special flats, branded as "massage parlors". Members of the criminal network profited from their "own" workforce, and collected racket from "independent" pimps and prostitutes operating in the areas under their influence. Channels to Western Europe were established with most intense trafficking towards France, Belgium and the Netherlands. There were special "officers", members of the network, responsible for the activities in those countries. These persons accounted for the money earned to the leaders of the organization. Judicial records show that more than

100 women were subject to sexual exploitation by this criminal network in Bulgaria and abroad.

Victims were recruited in the following ways: (i) through promises for fast and generous earnings and (ii) through the so-called “lover boy” model, in which inclination to prostitution was achieved on the basis of an emotional relationship. Most women were informed about the working conditions, the prices and the shares they were supposed to receive. Despite their initial consent the Prosecution qualifies the girls as “victims of trafficking”. According to the Bulgarian penal code the consent of the victim is irrelevant to the essence of the case for human trafficking. Even the fact that a girl has cooperated during the trafficking does not exclude the responsibility of the pimp/perpetrator.

Crossing the borders was arranged through regular and traditional ways – by public transportation or private cars, and all expenses covered by the criminal group. Prostitutes were constantly monitored during work. Accounting for the money was strict. Any breach of the rules was penalized with financial fines and physical punishments.

Within the structure of the criminal network, units of men responsible for the physical repression were formed (“force and violence” units especially participating in the structures of coercion and violence illustrated and analyzed below). They were also engaged in protection, a collection of money from the pimps and intimidation. In order to ensure better accountancy on behalf of the subordinates, the operational area of the organization was divided into several districts, under officers in charge of collecting the money. The mechanism functioned as follows: **A)** prostitutes account for the work done before the pimps; **B)** they in turn redirect the collected money to the bodyguards, who **C)** report to the “zonal” officer. We can qualify this officer as a cashier or ahead of the bodyguard unit. This person is authorized to use part of the turnover to cover the daily expenses of the organization (salaries, rent). **D)** The share of the profit is delivered to the deputy leader or the leader himself. Layering intermediaries between the money and the final beneficiaries reduces the risk of exposing the real promoters of the criminal activity.

It calls the attention that judicial records do not reveal corruption practices. However, the leader of the network, a former police officer, decided to improve his public image by a fake “break-off” with the criminal past. He ran for the local elections and became a municipal councilor on behalf of one of the national parties, notable for its record of electoral success and for corruption, relations with oligarchs and vote-buying scandals. Simultaneously this

“leader” decided to invest in the local football club, which plays in the top professional league in Bulgaria. In the meanwhile, on a deeper level, he continued to earn big money, exploiting victims of trafficking in Bulgaria and abroad.

Court Proceedings

The case gained publicity because the leader, while being a representative of the authorities, was accused and declared guilty of leading an organized criminal network. Hundreds of media publications reflected the plot since it began developing. Curiously, while held in custody this node/agent balloted for the National Assembly, relying on the presumption of innocence. Formally the case at this time was in prejudicial phase, proofs were being collected and no indictment was issued. According to Bulgarian law this vague status allowed him to participate in the elections and at the same time granted the defendant immunity, since political candidates cannot be placed under arrest. The party which made the nomination was registered by his former partner, who specialized in political nominations of persons under penal prosecution. This time however, despite the procedural game, the court left the incriminated leader behind the bars, where he spent the whole electoral campaign.

Finally, with a decision of the Court of Appeal of 2015, confirming the decision of the district court, the “leader” of the network, LEOFORCRGRIS, received 10-year prison term for creating and leading an organized and armed criminal group, engaged in human trafficking for sexual exploitation and money laundering. Other associates were also sentenced and some members of the group concluded judicial agreements.

Analyzed Sources

The processed data, that was used to elaborate this Social Network Analysis, was extracted from court decisions, related to the concluded case. Additional details were collected from the indictments, which provided exhaustive descriptions of the criminal network’s activities.

3. Characteristics of the Network

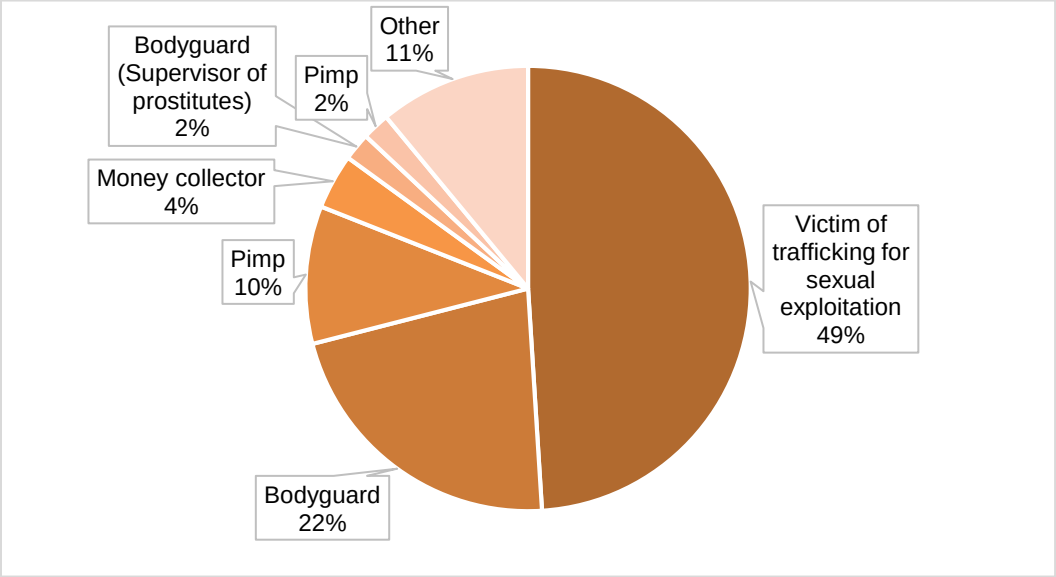
Nodes/Agents

The total number of nodes/agents registered in the sources is 188, distributed as follows:

Table 1. Total number of Nodes/Agents.

Nodes/Agents	
victim of trafficking for sexual exploitation	92
Bodyguard	41
Pimp	19
money collector	7
bodyguard [supervisor of prostitutes]	4
pimp [trafficker]	4
bodyguard and money collector	2
Dealer	2
leader of the organized criminal group	2
pimp [associate]	2
assistant of the leader	1
bodyguard of the leader [supervisor of prostitutes]	1
brother of OCG member	1
drug dealer	1
executive of the trafficking to France	1
executive of trafficking	1
Intermediary	1
leader`s son	1
money launderer	1
personal bodyguard of the leader	1
supervisor of prostitutes and traffickers	1
Treasurer	1
Undefined	1

Figure 1. Nodes/agents.



Due to the high amount of nodes/agents registered, this network can be classified as a case of macro-criminality; therefore, specific procedures for processing, modeling and analyzing this structure are required. If traditional procedures of judicial investigation are applied when trying to understand a case like this one, without additional computational tools, there are high risks that enforcement and intelligence agencies, as well as the general public, do not recognize the complexity, causes and consequences of the network.

The most relevant type of nodes/agents identified in this case groups the victims: the category “Victim of trafficking for sexual exploitation” constitutes 49% out of the total amount of nodes/agents. Most of those victims are women but the group extorted money from transgender women too. The median age of the trafficked women was 18-20 years: school graduates facing the need to find a job. In the search for a profitable occupation they became disposed to promises for good incomes abroad. Sometimes it was the woman who established the first contact with the pimp, asking for aid in finding a job abroad. The present analysis allows visualizing the structure of victimization established by the criminal group in question: The code identifying the victims begins with the letters VIOFS.

Other relevant types of nodes/agents group the members of the criminal structure, especially “Bodyguards” (22% out of the total amount of nodes/agents), “Pimps” (10%) and “Money Collectors” (4%).

The "bodyguards" are characterized as young males, often sportsmen in martial arts or other "strength" disciplines. They usually guarded the representatives of the higher levels in the network, but also protected the victims themselves. The leader was usually accompanied by a group of 10 and more bodyguards, who took care of his physical security and at the same time caused intimidation and respect among other criminals and the victims. In order to create an image of supremacy other senior members of the criminal network frequently deployed most of the bodyguards at their disposal.

The "pimps" are those nodes/agents in charge of: (i) luring girls to prostitution, (ii) introducing them to the working conditions and discipline, (iii) providing a place for the sex services and (iv) collecting the money paid by the clients.

The "money collectors", the main nodes/agents in the financial structure of the network, were in charge of managing the financial flows, generated through sexual exploitation. These were usually men who collected the money from the pimps and transferred it to other nodes/agents in the network, who in turn delivered it to the inner circle of the leader.

As previously mentioned, it calls the attention the lack of participation of public servants and officials, or the lack of investigations and prosecutions against facilitators at such public positions. Like any criminal structure, this THB network operated, mobilized financial resources and victimized so many individuals due to the aid and collaboration of "gray" nodes/agents operating within legal organizations and institutions. However, after elaborating this analysis, it can be concluded that the domestic judicial system of Bulgaria does not recognize the critical role played by officials and public servants in a criminal structure like the analyzed herein.

Despite the lack of formal investigations against public servants, one must however take into account the fact that for a certain period the leader of the group was a representative of the local administration (municipal councilor); therefore, the level of co-optation and manipulation of lawful institutions during this period was evident and intense. This constitutes a direct infiltration of formal and lawful institutions, and legal spheres of the government, by a node/agent operating also within and from the criminal underworld. In cases analyzed in other regions and other criminal activities, it has already been observed that criminal networks participate in political activity, specifically creating political parties and running for public offices with the purpose of achieving direct access to privileged information as well as legislative and executive decisions (Garay Salamanca & Salcedo-

Albaran, 2012; Garay & Salcedo-Albaran, 2015). In this case, by occupying a public position, the leader was able to use legitimate instruments for illegitimate goals. This case illustrates a situation beyond corruption, because a mobilization of public resources beyond financial bribes at the local level was used for generating criminal profits.

Interactions

The total amount of interactions is 1473 categorized into 4 main types: Operation (36%), financial (33%), logistics (14%) and coercion (9%). Additional interactions listed in the table below were categorized as "Other".

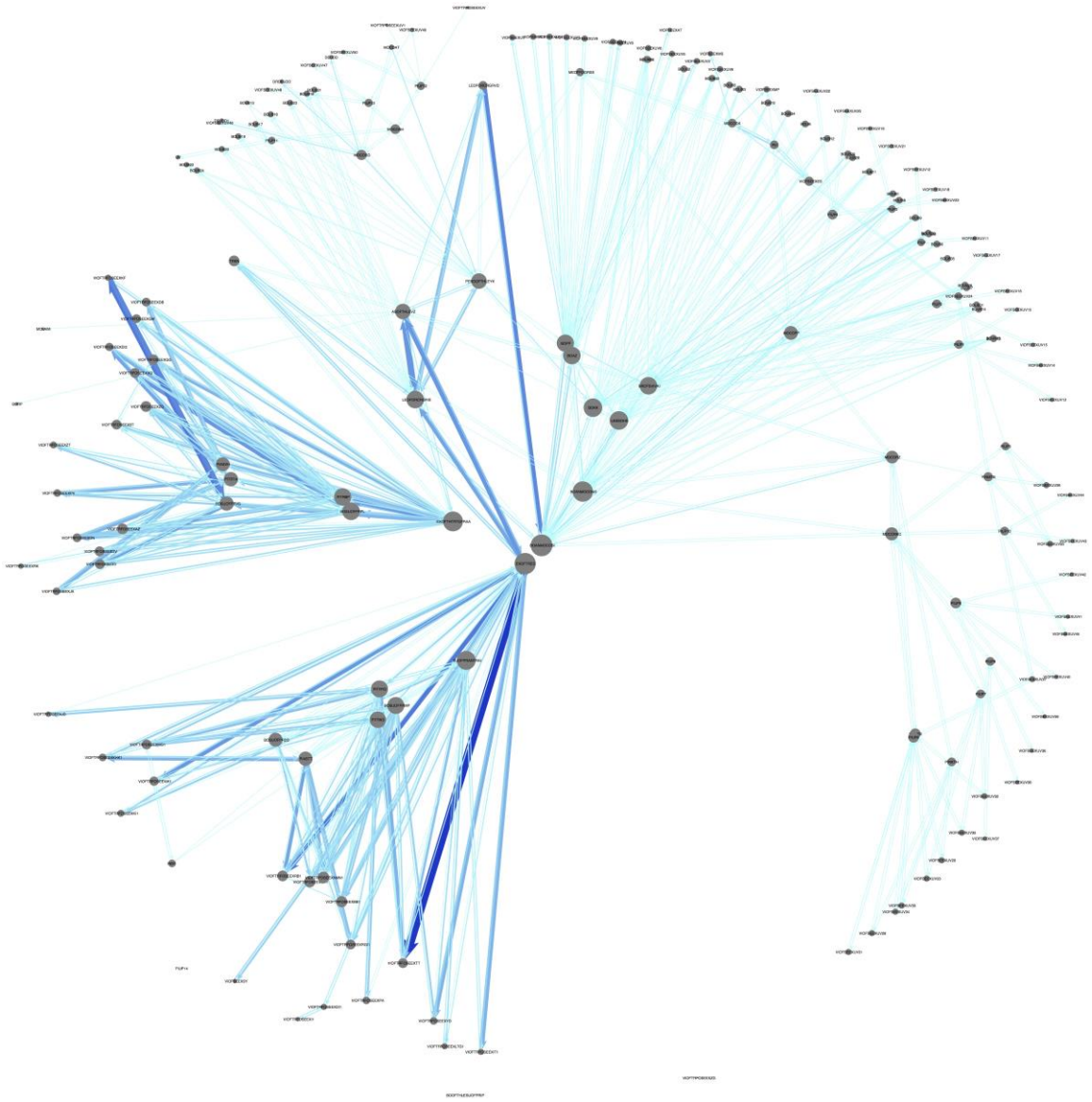
Table 2. Interactions grouped as "Other"

Interactions grouped as "Other"	
acquaintances	3
ask for a meeting	3
drug supplying	3
knowing the criminal group organization	3
living together	3
building close relations	2
imposing fine	2
knowing the criminal group's methods	2
phone call	2
refused offer	2
undefined	2
arguing about money	1
being brother	1
breaking up	1
collecting information	1
the decision to organized a criminal group	1
forced to work for him	1
imposing harsh rules for work	1
informing about corruption	1
introduction to work	1
knowing that he is the boss	1
knowing the reporting manner	1
knowing to be engaged in pimping	1
leading OCG	1
promising job	1
promising marriage	1
receiving instructions	1
recruiting as a personal bodyguard	1
recruiting for a personal driver	1
sister	1
spoiling relations	1
working together as policemen	1

The network is also characterized by intense interactions that are visualized in the figure below, in which it can be observed that some relationships have a high amount of iterations.

For instance, the relationship between EXOFTRED, who was in charge of trafficking women to Belgium and the Netherlands, and VIOFTRFOSEEXTT, a victim, register 15 iterations, represented with the thicker and darker arrow. VIOFTRFOSEEXTT is a victim of sexual exploitation who was exploited in Belgium and the Netherlands during three years. Initially she worked as a waitress in Bulgaria, but EXOFTRED promised her a dance girl job for high payment abroad. The first time she was accompanied and driven by EXOFTRED to Belgium. On the way, EXOFTRED explained to her that she was going to be prostituting. She has explained the rules of the work in a window, the price list for sexual services, the prohibition of walking around without an escort and the obligation of reporting the earnings, among other rules. The victim VIOFTRFOSEEXTT was required to call EXOFTRED every day to report her earnings. Following orders by EXOFTRED she was moved several times across various states. There she worked as a prostitute sticking to the work conditions, financial arrangements and control established by the group. The long period of exploitation and the strict control explain the high amount of iterations between these two agents/nodes.

Figure 2. Random distribution. Width and darkest blue represent the amount of interactions, being 15 is the highest amount.



The interactions grouped under the category “Operation” inform the operative structure of the network. Since most of the nodes/agents registered in the network are victims, on one hand, and “dark” or “pure criminals”, on the other, then it is expected that most of the analyzed sources inform about the operative procedures to recruit, control, manage and exploit the victims. The following are the specific and detailed interactions categorized as “Operative”:

Table 3. "Operative" interaction

"Operative" interactions	
Operation - introduction	105
Operation - meeting	85
Operation - reporting the turnover	72
Operation - giving instructions	38
Operation - traveling together	30
Operation - giving orders	29
Operation - teaming in organized criminal group	29
Operation - termination of relations	29
Operation - working together	21
Operation - accepting offer	19
Operation - offering job	15
Operation - recruiting OCG member	15
Operation - introducing new girl	11
Operation - require guard	9
Operation - recruiting clients	6
Operation - recruiting "new girl"	6
Operation - subordination	3
Operation - control	2
Operation - accepting the leadership of the new leader	1
Operation - allocating functions	1
Operation - approval of new girl	1

As it can be observed, "introduction", "meeting" and "reporting" are the three most relevant types of operative interactions. Figure 3 illustrates the "Operative" structure of the network with dark blue lines.[1]

The second most relevant type of interactions describes the financial structure of the network, grouping the interactions mentioned in the following table:

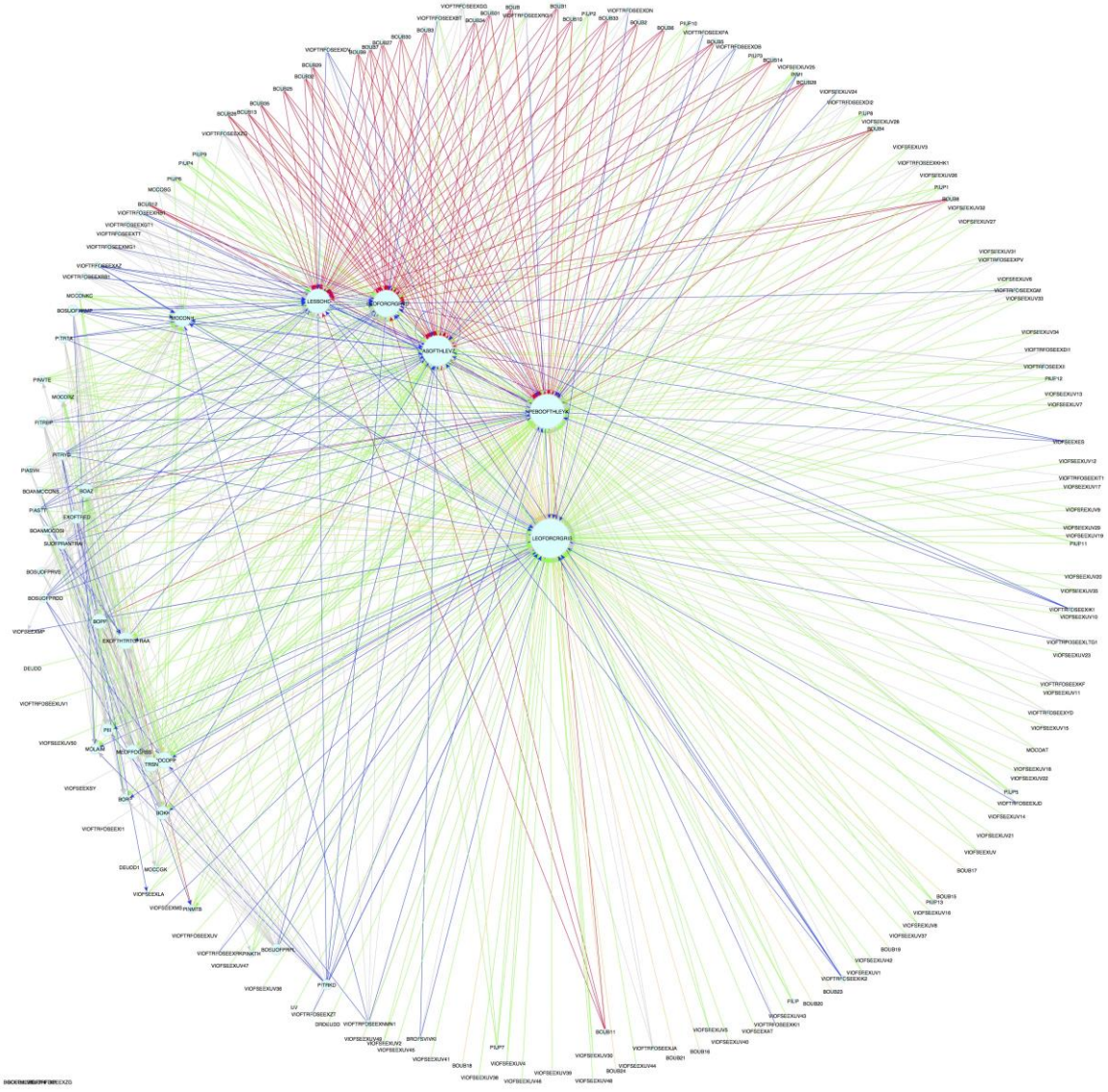
[1] As stated above, some "Operative" interactions had a high frequency; however, the Figure 3 does not represent frequency or "intensity" of interactions, therefore a single arrow may represent an "intense" relationship with various iterations. This explains why in Figure 3 there are more green lines (financial interactions) than dark-blue lines (operative interactions), despite the fact that more operative interactions (527) than financial interactions (490) were registered in the model.

Table 4. Financial interactions

Financial - giving earnings	193
Financial - collecting money	**168**
Financial - collecting the turnover	**80**
Financial - Making Payment	**38**
Financial - reporting money	**10**
Financial - dividing money	**1**

The fact that 490 interactions are related to the “financial” main category, illustrates the high amount of financial resources that flowed across the network. However, it is still critical to understand how those resources moved across the lawful and unlawful social structures, specifically in terms of money laundering and subsequent use of the earned profits. If those processes are not understood, and the role of gray nodes/agents within legal financial institutions is not addressed, the financial strength of this network will keep sustaining criminal activities even if some interactions are intervened and destroyed. In figure 3 the green lines illustrate the “financial” structure of the network.

Figure 3. Location and size represent the indicator of direct centrality (direct interactions). Blue lines represent "Operative" interactions, green lines represent "Financial" interactions, orange lines represent "Logistic" interactions and red lines represent "Coercive" interactions.



The third most relevant category of interactions describes the following logistic activities of the group:

Table 5. "Logistics" interactions

"Logistics" interactions	
Logistics [accommodation]	51
Logistics - guarding	47
Logistics - supervision	45
Logistics - transportation support	13
Logistics - guard	2

The fourth most relevant category groups the "coercive and violent" practices used in the criminal network (Table 6). This group of interactions describes the violent and coercive structure of the network, and is mainly characterized by the activities of the "force and violence" units already mentioned above. Those "force and violence" units are used in the network for racketeering pimps and prostitutes, intimidating rivals and confronting members who do not stick to the rules. Violence is also exercised over the victims, despite the fact that financial dependency is the most important instrument of control.

Table 6. "Coercion and violent" interactions

"Coercion and violent" interactions	
Coercion - intimidation	119
Coercion - physical violence	4
Coercion - forcing to prostitute	3

The structural bridge: "Betweenness" indicator and the capacity to intervene

The agent with the highest "betweenness" indicator (7.5%) is EXOFTRED. This node/agent is responsible for the trafficking of women to Belgium and the Netherlands. He is in charge of the overall organization of operations in those two countries. EXOFTRED was in fact authorized to decide which victim would travel. He organized the trip and transferred the profits to the leader or his deputy. The agent MOCOPP has a similar "betweenness" indicator, with 7.4% and his function was to collect money from sexual exploitation earned on the territory of Bulgaria.

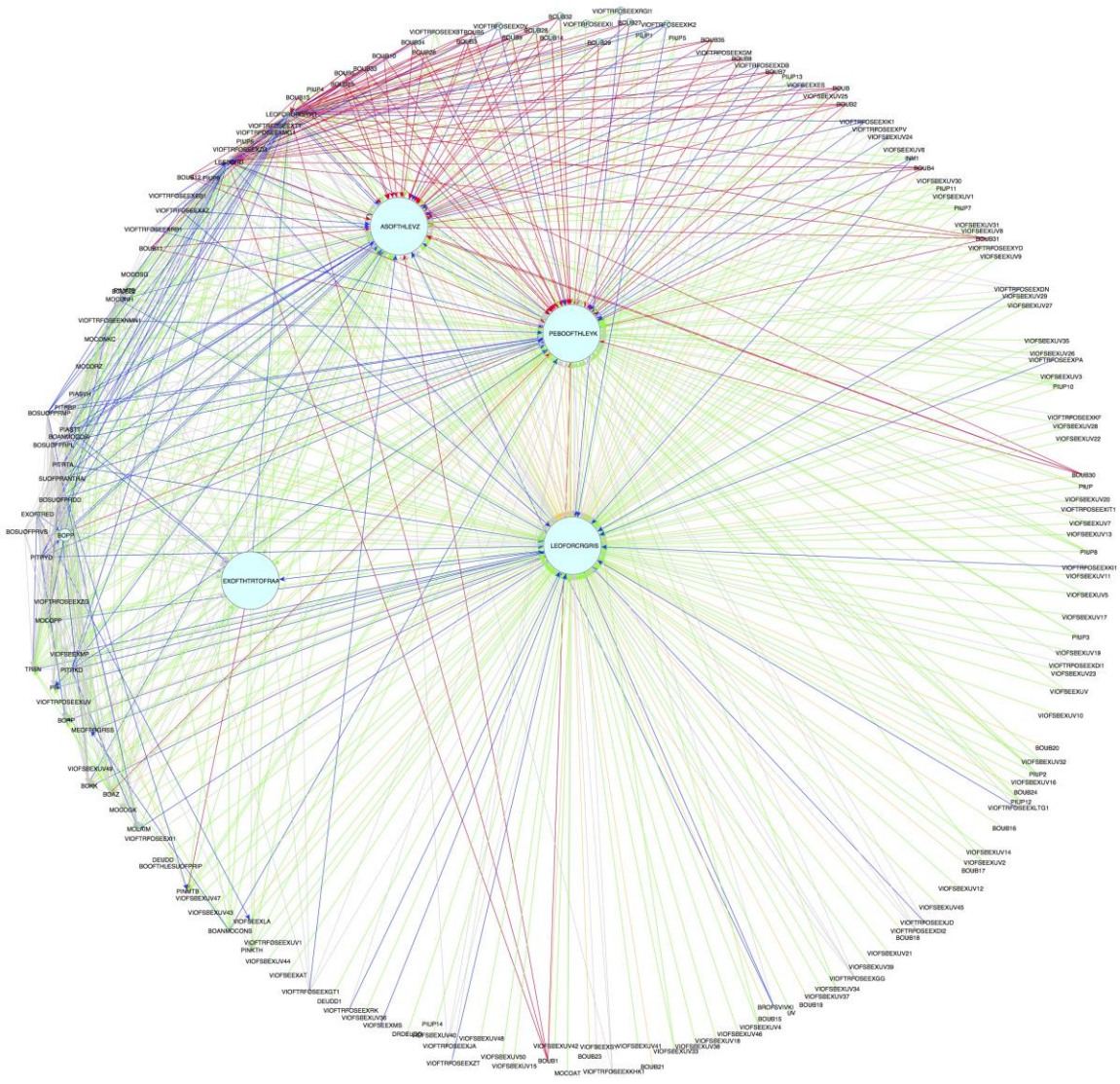
The third node/agent with the highest indicator of betweenness is EXOFTHTRTOFRAA, responsible for the human trafficking to France, with an indicator of 6.5%. Similarly to EXOFTRED, he was engaged with the organization and control of all criminal activities in that country. EXOFTHTRTOFRAA communicated with the leader and his deputy during the money transfers. The high "betweenness" indicator of the two members in charge for the operations abroad is explained by the fact that several geodesic routes flowed across these nodes/agents, there intervening in the arbitration of logistic resources,[2] information, decisions and money.

The three nodes/agents with the fourth, fifth and sixth highest betweenness indicators were BOANMOCOSI (6,2%), MOCONKC (6%) and MOCORZ (5,9). These nodes/agents acted as intermediaries between the pimps, supervising the prostitutes, and the more trusted nodes/agents in the network. The node/agent PEBOOFTHLEYK, with the seventh highest indicator, (5,9%) was in charge of the "force and violence" units. Following the leader's instructions, PEBOOFTHLEYK paid the bodyguards' salaries and controlled their actions. The leader himself, LEOFORCRGRIS, and his inner circle – ASOFTHLEVZ (assistant of the leader) and TRSN (treasurer)- also register "betweenness" indicator levels above 5%.

As a whole, the concentration of capacity to arbitrate resources is not highly concentrated in a single or small set of nodes/agents. This means that arbitration of Information and resources are evenly distributed among broader circles of nodes/agents, making it impossible to identify a single node/agent that could modify the entire structure of the flows of resources. Below, figure 4 illustrates the structure of the criminal network visualizing the betweenness indicator through the location and size of the nodes/agents.

[2] These logistic resources were mainly related to the travelling logistics, such as tickets, accommodations, and local transport, among others.

Figure 4. Location and size represent the indicator of betweenness (intervention in geodesic routes). Blue lines represent "Operative" interactions, green lines represent "Financial" interactions, orange lines represent "Logistic" interactions and red lines represent "Coercive" interactions.



"The Hub": Direct Centrality indicator and the concentration of direct interactions

The node/agent with the highest degree of "direct individual centrality" is BOANMOCOSI (3,1%). This person collects money from the pimps in Bulgaria, constantly communicating with them and the leader. The second node/agent with the highest direct centrality indicator

(2,9%) is responsible for the human trafficking to Belgium and the Netherlands, EXOFTRED. In fact, the person responsible for the human trafficking to France, EXOFTHTRTOFRAA, is the fourth node/agent with the highest indicator (2,6%). Before him, with an indicator of 2,7%, the third node/agent with the highest indicator is the cash collector, BOANMOCONS. An assistant of one of the "trafficking" managers, SUOFPRANTRAI, is also distinguished by high volumes of direct connections (2,3%) due to the specificity of his functions: he was responsible for recruitment of victims and for the subsequent transportation to the destination countries.

Nodes/Agents BOKK and LESSOHD have similar rates of "direct interaction" (2,2%). BOKK was a personal bodyguard of the deputy leader and later of the person in charge for the "force and violence" units. LESSOHD is the son of the leader's business partner LEOFORCRGRVD, who tried to regain his positions on the sex market. For that purpose he resorted to threats and violence. Finally, 19 nodes/agents in the network have "direct interaction" levels above 1, while the variations between them are slight.

This network is also highly decentralized in terms of the direct interactions, since the participation of 15 nodes/agents is required to concentrate a third (33.6%) out of the total amount of direct interactions established. This means that there is not a single node/agent intersecting a high number of direct relations and, therefore, the network is highly resilient. As already mentioned, the leader was a municipal councilor and he tried to mask his relations with the underworld. Therefore, the network functioned through several proxy associates who stood between him and the criminal enterprise based on sexual exploitation of trafficked victims; those proxies nodes/agents were described as having the highest betweenness indicators. Figure 3 represents the structure of the criminal network visualizing the indicator of direct centralizing through the location and size of the nodes/agents.

Conclusions

The present analysis reveals for the first time the high capacity of articulation of a criminal network engaged on Trafficking in Human Beings ("THB") for sexual exploitation in Eastern Europe. It is also revealed the capacity for victimizing a high amount of women: 92 identified in the present case. Recruiting, coercing and controlling 92 victims, like the ones identified in this case, require a sophisticated capacity for mobilizing and transporting women, logistic resources and money. Due to the high amount of nodes/agents participating (188), this

criminal structure can be defined as a complex criminal network, which means that it is impossible to understand its functions and interactions without the support of computational tools like the ones applied herein. This complexity is also reflected in the high amount of interactions that articulate each main sub-structure: 1473.

The operation of this network required the collaboration of public servants and officials who provided privileged information, favors and support. However, due to the lack of information about the participation of public servants and officials, the financial and operative structures are not fully understood and, therefore, cannot be fully tackled by enforcement agencies. This lack of information could be explained by intense levels of corruption or by a lack of investigative capacities in the Bulgarian enforcement agencies.

For instance, the complexity of the financial structure is illustrated with 490 registered and analyzed interactions. However, it calls the attention the lack of judicial information revealing the money laundering processes that were carried out by the network. If the financial structure of this network is not fully understood and addressed in terms of the support provided by local banks and exchange offices, the financial resources will keep flowing across those interactions and geodesic routes that were not disarticulated.

The network is highly decentralized and, therefore, highly resilient in terms of the direct interactions and the geodesic routes. This means that there is not a single node/agent concentrating a high amount of direct interactions or intervening in a high amount of geodesic routes. As a result, once this network was established, it will be highly difficult to destroy it. In fact, there is no coincidence between the *hub* and the *structural bridge,* which reveals the fact that not even removing the node/agent with the highest indicator of direct centrality or the node/agent with the highest indicator of betweenness, would affect the entire criminal structure.

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Annex 1. Direct Centrality Indicator

id	Degree
BOANMOCOSI	3.1
EXOFTRED	2.9
BOANMOCONS	2.7
EXOFTHTRTOFRAA	2.6
SUOFPRANTRAI	2.3
BOKK	2.2
LESSOHD	2.2
BOAZ	2
BOSUOFPRPL	2
BROFSVIVKI	2
LEOFORCRGRIS	2
BOPP	1.9
BOSUOFPRMP	1.9
PITRBP	1.9
PITRYD	1.9
PITRKD	1.7
ASOFTHLEVZ	1.6
PEBOOFTHLEYK	1.6
BOSUOFPRVS	1.3
PIASTT	1.3
PITRTA	1.3
BOSUOFPRDD	1.2
MOCOPP	1.2
PIASVH	1.2
MOCONKC	1.1
MOCORZ	1.1
VIOFTRFOSEEXNMN1	0.9
VIOFTRFOSEEXBB1	0.8
VIOFTRFOSEEXGT1	0.8
MOCOSG	0.7
PINVTE	0.7
PIUP6	0.7
PIUP9	0.7
TRSN	0.7
VIOFTRFOSEEXAZ	0.7
VIOFTRFOSEEXGG	0.7
VIOFTRFOSEEXRB1	0.7
VIOFTRFOSEEXZG	0.7
MOCONH	0.6
PINMTB	0.6
PIUP4	0.6
VIOFSEEXES	0.6
VIOFTRFOSEEXBT	0.6
VIOFTRFOSEEXDV	0.6
VIOFTRFOSEEXII	0.6
VIOFTRFOSEEXIK1	0.6
VIOFTRFOSEEXIK2	0.6
VIOFTRFOSEEXMG1	0.6
VIOFTRFOSEEXRGI1	0.6
VIOFTRFOSEEXTT	0.6

LEOFORCRGRVD	0.5
MOCOGK	0.5
PIII	0.5
PINKTH	0.5
PIUP1	0.5
PIUP10	0.5
PIUP2	0.5
PIUP7	0.5
PIUP8	0.5
VIOFTRFOSEEXDB	0.5
VIOFTRFOSEEXDN	0.5
VIOFTRFOSEEXGM	0.5
INM1	0.4
MEOFFOGRSS	0.4
PIUP	0.4
PIUP11	0.4
PIUP12	0.4
PIUP13	0.4
PIUP3	0.4
PIUP5	0.4
VIOFSEEXUV24	0.4
VIOFTRFOSEEXDI2	0.4
VIOFTRFOSEEXJA	0.4
VIOFTRFOSEEXKHK1	0.4
VIOFTRFOSEEXPA	0.4
VIOFTRFOSEEXPV	0.4
VIOFTRFOSEEXYD	0.4
BOUB	0.3
BOUB1	0.3
BOUB10	0.3
BOUB11	0.3
BOUB12	0.3
BOUB13	0.3
BOUB14	0.3
BOUB16	0.3
BOUB17	0.3
BOUB18	0.3
BOUB19	0.3
BOUB2	0.3
BOUB20	0.3
BOUB21	0.3
BOUB23	0.3
BOUB24	0.3
BOUB25	0.3
BOUB26	0.3
BOUB27	0.3
BOUB28	0.3
BOUB29	0.3
BOUB3	0.3
BOUB30	0.3
BOUB31	0.3
BOUB32	0.3
BOUB33	0.3
BOUB34	0.3
BOUB35	0.3

BOUB4	0.3
BOUB5	0.3
BOUB6	0.3
BOUB7	0.3
BOUB8	0.3
BOUB9	0.3
VIOFSEEXLA	0.3
VIOFSEEXMP	0.3
VIOFSEEXUV	0.3
VIOFSEEXUV1	0.3
VIOFSEEXUV2	0.3
VIOFSEEXUV25	0.3
VIOFSEEXUV26	0.3
VIOFSEEXUV27	0.3
VIOFSEEXUV28	0.3
VIOFSEEXUV29	0.3
VIOFSEEXUV3	0.3
VIOFSEEXUV30	0.3
VIOFSEEXUV31	0.3
VIOFSEEXUV32	0.3
VIOFSEEXUV33	0.3
VIOFSEEXUV34	0.3
VIOFSEEXUV35	0.3
VIOFSEEXUV4	0.3
VIOFSEEXUV5	0.3
VIOFSEEXUV6	0.3
VIOFSEEXUV7	0.3
VIOFSEEXUV8	0.3
VIOFSEEXUV9	0.3
VIOFTRFOSEEXDI1	0.3
VIOFTRFOSEEXIT1	0.3
VIOFTRFOSEEXKF	0.3
VIOFTRFOSEEXKI1	0.3
VIOFTRFOSEEXLTG1	0.3
VIOFTRFOSEEXZT	0.3
BOUB22	0.2
MOCOAT	0.2
VIOFSEEXMS	0.2
VIOFTRFOSEEXJD	0.2
VIOFTRFOSEEXRK	0.2
BORP	0.1
BOUB15	0.1
DEUDD	0.1
DEUDD1	0.1
DRDEUDD	0.1
MOLAIM	0.1
UV	0.1
VIOFSEEXAT	0.1
VIOFSEEXSY	0.1
VIOFSEEXUV10	0.1
VIOFSEEXUV11	0.1
VIOFSEEXUV12	0.1
VIOFSEEXUV13	0.1
VIOFSEEXUV14	0.1
VIOFSEEXUV15	0.1

VIOFSEEXUV16	0.1
VIOFSEEXUV17	0.1
VIOFSEEXUV18	0.1
VIOFSEEXUV19	0.1
VIOFSEEXUV20	0.1
VIOFSEEXUV21	0.1
VIOFSEEXUV22	0.1
VIOFSEEXUV23	0.1
VIOFSEEXUV36	0.1
VIOFSEEXUV37	0.1
VIOFSEEXUV38	0.1
VIOFSEEXUV39	0.1
VIOFSEEXUV40	0.1
VIOFSEEXUV41	0.1
VIOFSEEXUV42	0.1
VIOFSEEXUV43	0.1
VIOFSEEXUV44	0.1
VIOFSEEXUV45	0.1
VIOFSEEXUV46	0.1
VIOFSEEXUV47	0.1
VIOFSEEXUV48	0.1
VIOFSEEXUV49	0.1
VIOFSEEXUV50	0.1
VIOFTRFOSEEXI1	0.1
VIOFTRFOSEEXUV	0.1
VIOFTRFOSEEXUV1	0.1
BOOFTHLESUOFPRIP	0
PIUP14	0

Annex 2. Betweenness Indicator

id	Betweenness
EXOFTRED	7.5
MOCOPP	7.4
EXOFTHTRTOFRAA	6.5
BOANMOCOSI	6.1
MOCONKC	6
MOCORZ	5.9
PEBOOFTHLEYK	5.9
ASOFTHLEVZ	5.8
LEOFORCRGRIS	5.7
TRSN	5.2
BOANMOCONS	5
MOCONH	4.1
BOAZ	2.3
BOPP	2
BOKK	1.7
PIUP9	1.7
PIUP4	1.4
PINVTE	1.3
MEOFFOGRSS	1.2
MOCOSG	1.2
SUOFPRANTRAI	1.1
PIUP1	1
PIUP10	1
PIUP2	1
PIII	0.9
PINKTH	0.8
PIUP12	0.8
PIUP13	0.8
PIUP8	0.8
PIUP	0.7
PIUP11	0.7
PIUP3	0.7
PINMTB	0.6
PIUP5	0.6
PIUP6	0.6
VIOFSEEXES	0.5
MOCOGK	0.4
BOSUOFPRPL	0.3
LEOFORCRGRVD	0.3
PITRBP	0.3
PITRYD	0.3
VIOFTRFOSEEXDI1	0.3
VIOFTRFOSEEXDV	0.3
BOSUOFPRVS	0.2
PITRTA	0.2
PIUP7	0.2
PITRKD	0.1
VIOFSEEXUV24	0.1
VIOFSEEXUV25	0.1
VIOFSEEXUV26	0.1

VIOFSEEXUV27	0.1
VIOFTRFOSEEXIK1	0.1
VIOFTRFOSEEXMG1	0.1
BOOFTHLESUOFPRIP	0
BORP	0
BOSUOFPRDD	0
BOSUOFPRMP	0
BOUB	0
BOUB1	0
BOUB10	0
BOUB11	0
BOUB12	0
BOUB13	0
BOUB14	0
BOUB15	0
BOUB16	0
BOUB17	0
BOUB18	0
BOUB19	0
BOUB2	0
BOUB20	0
BOUB21	0
BOUB22	0
BOUB23	0
BOUB24	0
BOUB25	0
BOUB26	0
BOUB27	0
BOUB28	0
BOUB29	0
BOUB3	0
BOUB30	0
BOUB31	0
BOUB32	0
BOUB33	0
BOUB34	0
BOUB35	0
BOUB4	0
BOUB5	0
BOUB6	0
BOUB7	0
BOUB8	0
BOUB9	0
BROFSVIVKI	0
DEUDD	0
DEUDD1	0
DRDEUDD	0
INM1	0
LESSOHD	0
MOCOAT	0
MOLAIM	0
PIASTT	0
PIASVH	0
PIUP14	0
UV	0

VIOFSEEXAT	0
VIOFSEEXLA	0
VIOFSEEXMP	0
VIOFSEEXMS	0
VIOFSEEXSY	0
VIOFSEEXUV	0
VIOFSEEXUV1	0
VIOFSEEXUV10	0
VIOFSEEXUV11	0
VIOFSEEXUV12	0
VIOFSEEXUV13	0
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VIOFSEEXUV15	0
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VIOFSEEXUV4	0
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VIOFSEEXUV7	0
VIOFSEEXUV8	0
VIOFSEEXUV9	0
VIOFTRFOSEEXAZ	0
VIOFTRFOSEEXBB1	0
VIOFTRFOSEEXBT	0

VIOFTRFOSEEXDB	0
VIOFTRFOSEEXDI2	0
VIOFTRFOSEEXDN	0
VIOFTRFOSEEXGG	0
VIOFTRFOSEEXGM	0
VIOFTRFOSEEXGT1	0
VIOFTRFOSEEXI1	0
VIOFTRFOSEEXII	0
VIOFTRFOSEEXIK2	0
VIOFTRFOSEEXIT1	0
VIOFTRFOSEEXJA	0
VIOFTRFOSEEXJD	0
VIOFTRFOSEEXKF	0
VIOFTRFOSEEXKHK1	0
VIOFTRFOSEEXKI1	0
VIOFTRFOSEEXLTG1	0
VIOFTRFOSEEXNMN1	0
VIOFTRFOSEEXPA	0
VIOFTRFOSEEXPV	0
VIOFTRFOSEEXRB1	0
VIOFTRFOSEEXRGI1	0
VIOFTRFOSEEXRK	0
VIOFTRFOSEEXTT	0
VIOFTRFOSEEXUV	0
VIOFTRFOSEEXUV1	0
VIOFTRFOSEEXYD	0
VIOFTRFOSEEXZG	0
VIOFTRFOSEEXZT	0

About the Authors

Georgi Petrunov

Georgi Petrunov is a graduate in Sociology (2003) and Global Studies (2005) from the St. Kliment Ohridski University of Sofia. He has a Ph.D. in Sociology from the Bulgarian Academy of Sciences (2007). His research has been focused in organized crime studies. Currently supports the team of investigators at Risk Monitor in Bulgaria.

Nikolay Yanev

Nikolay Yanev is a graduate of the University of Sofia and the New Bulgarian University. es has worked in the administration of the Operartional programme "Human Resource Development" (European Structural Funds). Cosultant of the Ministry of Education and Science, Pepublic of Bulgaria (2014-2015). Project manager, consultant and researcher for RiskMonitor Foundation. Consultant to the project department of the University of Sofia

Eduardo Salcedo-Albarán

Philosopher and MsC in Political Science. Founder and CEO at Vortex Foundation. Eduardo has researched in the areas of organized crime, kidnapping, corruption, drug-trafficking and State Capture. As partner, advisor or consultant, he currently researches on the structure and impact of Transnational Criminal Networks with scholars, institutes and Universities in North, Central and South America, Europe and Africa.