

Assessment of PhD thesis of Tomas Diviak: *Criminal networks: actors, mechanisms, and structures*

PhD thesis of Tomas Diviak: *Criminal networks: actors, mechanisms, and structures* consists of introduction, six chapters (published as papers), and a conclusion.

In *Introduction* Tomáš Diviak explains, why he studied organized crime as a network, what are the challenges and how he could solve it. In our modern societies can organized crime best be described as a network. Networks are „flexible, adaptable, resilient, and polycentric, giving criminals an advantage over law enforcement“. Criminal network analysis faces three challenges. It needs „theoretical explanations, appropriate methods and valid data.“ (p.10) Tomáš Diviak used in some best chapters theoretical framework of analytical sociology and mostly also advanced statistical models for network data. Then he gives a short overview of the whole book. *Second chapter* author used as an efficient description and clear and understandable explanation of main concepts and terminology. This chapter was successfully published in Czech academic journal.

Chapter three and chapter four are both based on original Czech data which Tomáš Diviak collected in the Czech Republic using online and print media as data source for „Rath Affair“ of political corruption case and court files from three different court files for the „methanol affair“ of alcohol distribution criminal network. In both cases the perfect network analysis made by the author, probably with some small advice of his two supervisors from Groningen University has been successfully published in top international journals *Trends in Organized Crime* (2018) and *Global Crime* (2019). The first case studied, „how certain micro-level features bring about macro-level outcomes“ (p. 34). Three research questions concern „core/periphery structure“ (p.36) of corruption network, „how different types of ties overlap in the aggregated network“ (p.39) and „which actors are central in different dimensions of corruption network“ (p.41). Tomáš Diviak differentiates „resource transfer“, collaboration“ and „pre-existing ties“ (p.43-44). He used previous studies as good examples of analysis of networks and his study brings excellent results. He revealed perfect core/periphery structure and very probably proved a „mechanism of generalized social selection“ (p.50), where individuals with certain qualities (Kott, Pancova) tend to occupy adequate structural positions within the criminal corruption network. For example the „preexisting ties“ (between Kott, Pancova and Rath) „serve as a basis for ties in other dimensions“ (p.51). The three multiplex and central nodes are Kott, Pancova and Novanska and they are active across dimensions (p.54). The valid and clear results of this analysis of political corruption network are: 1) most of the ties are either collaboration or resource transfer, not both; 2) clear distinction between prominent and marginal actors. 3) generally the multiplex point of view may reveal important information (p.58). This study is valuable also from the point of view of sociological theory. The case of this study was analyzed with mechanism-based explanation in mind. This confirms the use of analytical sociology approach by Hedström and Bearman.

The next difficult case presented in *chapter 4* really needs the use of analytical sociology theory and also the most advanced statistical methodology of ERGM exponential random graph approach. The alcohol distribution network analysis brought in this case the original finding, that was the importance of pre-existing ties for operational ties. This chapter demonstrates „the utility of combining analytical sociology with statistical models for social networks“ (p.81). In this „methanol affair“ the entrepreneurs, e.g. actors with strategic skills and resources, were important for successful operation. The use of Granowetter theory of the strength of weak ties was very useful here and did show that in this special case the heterophily is the right type of mechanism in use (p.69). The very detailed discussion of the first hypothesis („Actor display tendencies against preferential attachment“ (p.67) on pages 77-78 uncover the importance of „the most prominent

distributors“ in the network. The use of „the geodesic distance from the two manufacturers“ shows the really very good understanding of difficult methodology which has been applied in this case analysis.

The next *chapter 5* brings a testing of a theory on criminal network, which was based on meta-analysis of nine ideology-driven and eleven profit-driven criminal networks from the point of view of efficiency/security trade-off. I will not discuss this chapter in detail. The very difficult situation in testing such theory describe the author by words: „there is very little support in our data that this trade-off is fundamentally different in profit- and ideology-driven networks. I the meaning of authors it needs „extending the theory“ (p.102).

In the opposite the very promising/successful *chapter 6* presents the analysis of dynamics in two jihadi terrorist networks. The paper, which is now under review, set two related research questions: „How did the structure of these jihadi extremist networks change after the disruption by law enforcement agencies?“, and „How did the tendencies of actors to connect with others change after the disruption?“ (p.108). Chapter 6 describes and analyses two types of relational mechanisms in criminal networks: trust-enhancing mechanisms and risk-reducing mechanisms (p.111-114). Here can we also see the influence of analytical sociology approach, when the authors analyze actors and mechanisms. Some important aspects of these jihadi networks are analysed – ethnic background, radical settings, previous arrest and police attention. In the result section authors describe the change in network structure using different measures of density, core/periphery setting, similarity and extent of cell-structure. Both networks display the structural compositions of core/periphery (p.122). The first network becomes less dense and more centralized after law enforcement disruption. Its cohesion was strongly affected by the disruption. On the contrary, the disruption of network 2 strengthened its cohesion. The core/periphery structure in both networks allowed substituting arrested actors with new ones and networks continue functioning (123). The response to the important question 2 concludes „that triadic closure was the driving force behind the change in both networks under disruption“ (p.125). The major importance has the methodological progress – the use of Stochastic Actor-oriented Models, „SOAMs“. Also this chapter enhance the quality of analysis of criminal networks.

Chapter 7 Key aspects of covert networks data collection: Problems, challenges, and opportunities, which is in print in a methodological journal *Social Networks*, brings original authorized analysis of an important methodological problem of the study of covert networks. It examines six aspects of covert networks data collection: nodes, ties, attributes, levels, dynamics and context. Especially studies the cases, when data are missing. That was also important demand for the author when he in chapter 6 described the dynamics of jihadi networks recovering. I should agree with the author, when he says in the chapter conclusion: „There is quite a steep learning curve from basic descriptive measures to advanced statistical models in SNA ... with good data, these models provide powerful and flexible tools for testing a variety of hypotheses.“.

Chapter 8 bring a usefull summary and conclusions of the whole disertation. One of the recurring findings was, that „mechanism in which pre-existing ties translate into operational ties“ (p.157) Pre-existing ties fulfilled a trust-enhancing role. Triadic closure is a relational mechanism denoting the tendency of actors to close open triads. Also statistical models support the existence of triadic closure in cross-sectional as well as longitudinal network data (p.158). One of the simple, but important conclusion of the disertation to „network analysis“ says: „event basic descriptive measures in SNA can provide non-trivial and unique information that would not be gained by simply reading trough contextual or qualitative description of the case“ (p.160).

As a general assessment of PhD thesis of Tomas Diviak: *Criminal networks: actors, mechanisms, and structures* I am happy to say, that presented PhD thesis shows an excellent example of precise and deep subject knowledge and its advanced application in solving interesting and difficult research questions. The author acquired himself valid data about two Czech criminal affairs, one data set from media (online and print) and the second one from three different courts. He applied advanced theoretical approach of analytical sociology and learned and appropriately applied advanced statistical methods for SNA. Well designed study connects all parts into a well structured complex whole, in which author solved many important research questions. The publication of almost all (definitely 5) parts of the study in very good (in three cases in top) scientific journals also proves, that this dissertation is of the best quality and in the highest achievable level. PhD student Tomas Diviak qualifies for the degree and is allowed to his defense and after defence to obtain the degree of PhD at the University of Groningen and also the degree of PhD at Charles University in Prague (Double PhD Degree). The manuscript of PhD thesis of Tomas Diviak may be considered for the cum laude predicate.

Questions for the defence discussion:

What recommendation can you give for the law enforcement disruption acts after analysis of the presented jihadi networks?

Can you apply some results from your analysis of Czech criminal networks which could be practically useful for the police investigation or for the court and legal actions in the Czech Republic?

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