

**THE EFFECTS OF THE ELECTORAL REFORM ON MEMBERS OF
THE ROMANIAN PARLIAMENT: A NETWORK ANALYSIS**

by

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ABSTRACT

In this thesis, I analyze the characteristics of the legislative networks inside the Romanian Parliament, by treating the Members of Parliament as nodes and their initiated proposals as links between them. I map out the networks of collaboration of the Romanian legislature for a period of four years and between two electoral systems – proportional representation with closed lists (2006-2007) and mixed-member proportional with single member districts (2009-2010). Based on the theories of purposiveness and competing principals with respect to legislative accountability, the social network analysis that I undertake aims at spotting the differences in the structural positions of the legislators before and after the electoral reform in 2008. I employed centrality measures, conducted sub-group analysis and a Relational Contingency Tables analysis to test my hypothesis. Findings show that there is change in the behavior of legislators in two different electoral systems. It is easier in the mixed-member proportional system to form collaboration ties than in the previous electoral system. However, the observed relationships have the opposite effect than expected, with a less dense network with more cross-party collaborations in 2006 and highly dense with strong party clusters in 2010. The expected party discipline in the proportional representation system (2006-2007) is broken by legislators with a strategic position in the networks, who encourage cross-party collaborations on initiating legislative proposals. Generally, the effect of the electoral reform is weak. This research links network positions to the competing principals' theory, by rethinking agency and its practical implications for party politics.

Key words: Legislative behavior, social network analysis, collaboration networks, Romania, electoral reform.

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LIST OF ABBREVIATIONS

FSN - National Salvation Front
INDEP – Independent Representative
LP – Legislative Proposal
MIN – Minority Representative
MMP – mixed-member proportional
MP – Member of Parliament
PC – Conservative Party
PD/PD-L – Democratic Party/Democrat-Liberal Party
PDSR - Romanian Social Democratic Party
PNL – National Liberal Party
PR – proportional representation
PRM – Greater Romania Party
PSD – Social Democrat Party
PUNR - Party of Romanian National Unity
PUR-SL – Social Liberal Humanist Romanian Party
RCT – Relational Contingency Table
SNA – social network analysis
SMDs – single member districts
UDMR – Democratic Magyar Union of Romania

INTRODUCTION

Reforming electoral systems has been a central concern for both academics and political reformers in the past decades. More legitimacy, more accountability, more representation, a tightened control of citizens over policy making processes, and increased popular participation, have constituted the latest goals within democratic and newly democratized regimes. Theoretical and empirical evidence so far point to the fact that the electoral system matters when judging to what degrees these aims can be accomplished (Birch 2000; Calvo 2009; Calvo and Hellwig 2011; Carey and Shugart 1995; Cox, Rosenbluth, and Thies 1999; Golder and Stramski 2010; Hix, Johnston, and Iain 2010; Lancaster 1986; Lijphart 1990; Norris 1997). “Electoral reform is founded upon the principle that altering the formal rules matters based on the assumption that certain desirable consequences for social and political engineering can be achieved through the public policy process” (Norris 2004). Building on these ideas, in this thesis, I test the extent to which the electoral system affects legislative behavior using the unique case of a natural experiment, Romania, where in 2008 the electoral system was changed from proportional representation (PR) with closed lists to a mixed-member proportional system (MMP) with single member districts (SMDs). Departing though from what other studies have tackled so far, I aim at taking a new perspective in measuring changes in the behavior of legislators, by looking at how they collaborate inside the Parliament.

Recently, there has been growing literature in political science that deals with political networks, centers that collect such type of data, and more attention focused on the “relational” characteristic of politics and political behavior (McClurg and Young 2011). Studies on political networks so far, even though increasing, have been mainly neglecting legislators’

networks, perhaps because of problems with the availability of data. With the increase in the importance of an “open and transparent institution” though, legislatures around the world started updating information on institutional websites, letting public information be public, at the great joy of academics. Studying legislative networks has some advantages: data is easy to collect, the population is rather small (or medium sized), there are certain institutional constraints which make behavior more structured, findings bring a lot of insights, and their practical implications are already known. The beneficiaries of such studies are not only political scientists and network scientists, but also political parties and public policy decision-makers.

Patterns of collaboration, measured as the legislators’ initiated proposals, reveal information not only about institutional constraints to specific collaboration relations (Carey 2009), but also about the influence of their structural positions inside the legislative network (Tam Cho and Fowler 2010). In other words, I explain the relation between specific structures of the network of legislators and their political behavior. I examine the dynamics of collaborations inside the Romanian legislature along four years (2006, 2007, 2009 and 2010), and between two electoral systems (PR with closed lists and MMP with SMDs). Social network analysis (SNA), as a methodological approach to legislative behavior is new in the political science literature but with great benefits: from capturing hidden patterns to visualizing structures, SNA is not perfect, but only by constant attention to both theoretical and empirical models can one make it better (McClurg and Young 2011).

Based on the theoretical model that legislators respond to their principals’ demands, I propose another methodological approach to studying political accountability. The network analysis that I apply discloses valid findings about what drives legislators to behave the way they do.

Network analysis opens the floor for a reconsideration of the methodological tools used for measuring effects of macro-political phenomena on micro-level phenomena, such as legislative politics and behavior, and party politics and dynamics. This adds up to previous research in three respects: first, it explores hidden relationships revealed by the network analysis, and their importance in determining legislative behavior; second, it links the electoral system to the dynamics of collaboration relationships inside the Parliament, by scrutinizing the causal mechanism between the two; finally, it delves into new possibilities of research, previously overlooked, by emphasizing their potential for providing meaningful information about how one can study legislative behavior and party discipline.

The approach in political science towards studying political networks is becoming more and more important because of the tools developed by network scientists that are able now to upgrade the concept of networks from the level of simple metaphorical constructions to fully quantifiable entities. They retain information about the sometimes hidden structural aspects of collaboration. These aspects are studied in the thesis through objective data, unbiased by self-reporting, or other subjective methods of gathering information about the units of observation. I consider the initiated proposals to be a valid proxy for the behavior of legislators.

Legislative behavior, in this study, refers to how legislators respond to their principals, in terms of being hold accountable. Traditionally, this refers to the type of electoral system - proportional representation with closed lists, where legislators are more accountable to the central party leadership; and mixed-member system with single-member districts, where the constituent-legislator bond should be tighter (Carey 2009). John Carey (2009) claims that the link between the two electoral systems carries the type of representation they enable: collective representation, in a PR system, and individualistic representation in a SMDs system.

He concludes though that academic endeavors to find out if reforms from the first system to the latter had the intended purpose did not show clear evidence in support of changing the electoral system to achieve greater accountability of legislators to their constituents (Carey 2009). This study aims at exploring this question, and delivering a tentative answer by looking at the most sensitive indicator of legislative behavior – collaboration.

Romania presents a good case for being studied for two main reasons: first, in March 2008, the Romanian Parliament passed a new electoral law that changed the way members of the Lower and Upper Chambers are elected. In November 2008, Romanians elected their representatives under the new electoral system. From a party-list proportional representation system, the reform brought a mixed-member proportional one (first-past-the-post in only one round) with single member districts (SMDs). The purpose of changing the electoral law which was in place from 1990, after the fall of the communist regime, was to make politicians more accountable to voters. There are several other countries in the world where there was a change in the electoral system to a mixed-member proportional with SMDs, with the intended purpose of bringing legislators closer to voters – Italy, Russia, Ukraine, Japan, New Zealand, the Philippines, Bolivia, Guatemala, Panama, Venezuela, and Mexico (Norris 2004). However, Romania is the only case where there was a change from party-list PR to MMP with SMDs, which offers a unique opportunity of a research design of a natural experiment: before and after 2008.

The second reason for choosing Romania is a more pragmatic one, and refers to the fact that I understand the language, know the political context, and have access to information that I can meaningfully use in this study. Also, collecting data for all these countries is a very long process, where data might not be available, or where there is a language barrier. Presenting

the case of only one country, where the new methodology is complemented by the depths of the particular context in which the country finds itself, seems appropriate for a first try of the new perspective argued for in this thesis. The empirical model constructed here can then be used for the analyses of cross-national cases in later researches.

A certain layout of the structure of the networks enables one kind of communication process, with particular characteristics, that further affects the way legislators interact among themselves, how they create alliances, how they support the leader, and how they oppose legislation. (Siegel 2009), for example, finds that in the context of interdependent decision making, where individuals have heterogeneous motivations to participate, some structural characteristics of the networks have an impact of the outcome – the size, the prevalence of weak ties, the presence of elites. Even though Siegel's study focuses on collective action and the implications of the networks of individuals for political participation, his typology is useful for the purpose of this study: small-world network, village (clique) network, opinion-leader network, and hierarchical network. The opinion-leader network will be discussed more in detail in subsequent chapters, when the Romanian legislators' networks will be mapped out. Conversely, particular behavior in the Parliament determines subsequent behavior outside it. In other words, the general political behavior is affected by the way MPs maintain contact with their constituencies, the role they play at the local level, their importance and implication in the party politics, their financial independence, and the way they propose candidates. While looking for patterns of collaboration between legislators coming from the same region is important and possibly a fruitful path for research, I am mainly interested in the cross-party collaboration patterns. The new system was expected to weaken the centralized power of the party, by loosening the ideological attachments of legislators. On the one hand, this implies that legislators coming from a certain party are not as accountable anymore to the party in

terms of initiating legislation (as long as they find support elsewhere) as they were prior to the electoral system change (Carey 2009).

In this thesis, I pursue two arguments: at the theoretical level, I argue that the electoral system influences the accountability structure of legislators. From a methodological perspective, I argue that social network analysis provides useful tools for measuring legislative behavior, tools that are unavailable from other approaches. Chapter 1 describes the political context of Romania from the early 1990s to the present. Then, a brief description of the two electoral systems is discussed, emphasizing the main differences between them. Chapter 1 finishes with a brief description of the main concepts and indicators used in the present thesis. In Chapter 2, I critically assess scholarly literature on the topic of my thesis and present the theoretical framework in which I construct my first argument. Based on the competing principals' theory and previous studies done on the methodological approach to my topic, in Chapter 3, I frame the hypotheses. Then, in Chapter 4, I provide a description of the data I collected, with an emphasis on the types of matrices I work with and their meaning to the analysis. Further, I state my methodology and research design by comparing them to previous scholarly works, building my second argument and justifying my choices based on the nature of the dataset collected and the research question. Chapter 5 presents and discusses the results of the analyses and their implications for Romanian politics, and more generally for the study of legislative behavior and electoral systems. In the Conclusions section, I summarize the arguments and the findings, and set the ground for further research.

CHAPTER 1. THE CONTEXT

1.1 Romania's political development (1990-2010)

A brief account of Romania's political development since the 1990s is necessary, in order to shape the context of legislative behavior. The type of government, the public opinion, the economic struggles, all of these variables might have an effect on the way legislators behave. However, in this thesis, the purpose of this section is solely to keep them in mind when interpreting the results, not empirically challenge them. For that, I restrict my analysis to the theoretical implication of the electoral reform.

After 45 years of communism, out of which 24 under the rule of Nicolae Ceaușescu, Romania experienced a violent overthrow of regime in 1989, after which a period of “difficult” democratization followed (Gallagher 2001). Scholars of post-communism argue that today, the country can be considered a consolidated democracy, but in comparison to other Central and Eastern European countries, its transition to this stage was “challenging” (Crowther 2010; Craiutu 2000; Ciobanu 2007). Since the fall of the communist regime, five governments came to power, each of them with significant consequences for the development of the country. All of them were coalition governments.

In 1992, the National Salvation Front (FSN), a reminiscence of the communist rule, with Ion Iliescu as the leader, came to power. Iliescu formed a coalition with some of the ultra-nationalist parties (the Party of Romanian National Unity - PUNR, and the Greater Romanian Party - PRM). In a coalition of left-wing and right-wing ideologies, policy formation and reform were a failed process, bringing people to a general dissatisfaction and disappointment (Crowther 2010). In 1996, an alternative liberal coalition government was formed, with a new reform agenda, under President Constantinescu. The government failed to change Romania's

direction towards a better economic performance and political development. Corruption cases became more acute and evident, and there was “little or no interest in authentic transparency and accountability” (Crowther 2010).

Popular disappointment grew after the failure of the liberal coalition to improve the country’s condition. In light of this disillusionment, Iliescu was again elected the President of Romania in 2000, and his resurrected leftist party, now called the Romanian Social Democratic Party (PDSR), formed a coalition government with the center-right UDMR. This coalition aimed at countering the rising extreme-right party, the Great Romania Party (PRM), which with a discourse of fighting corruption and auto-portrayal as “the marginalized outsiders” (Crowther 2010), gained 19.5% in the Parliament. The leftist government of 2000 proved interested in the EU accession. However, corruption still remained one of the biggest problems in the country, as well as a low transparency and accountability of politicians.

In 2004, Traian Băsescu was elected President, from the Democratic Party. A center-right leader and former mayor of Bucharest, Băsescu proved to have been popular among the people. He and his party, the Democratic Party (PD) gained much of the people’s support by focusing throughout the campaign on anti-corruption discourse and a fresh reform agenda. Some of the reforms proposed by Băsescu materialized also as a consequence of EU accession requirements (Romania joined the European community in 2007). However, there were other ongoing problems still persisting in the country. The fourth coalition government, consisting of the Democratic Party (PD) and the Liberal National Party (PNL), proved to be too ideologically different, and this brought about a conflict between the President and the Prime-Minister, Călin Popescu-Tăriceanu. This conflict brought to light corruption scandals and the interest of politicians for holding-office benefits (Crowther 2010).

In 2008, a new coalition was formed. It was made up of the new Democratic Liberal Party (PD-L) - which merged in 2007 from Democratic Party, and a branch that defected from the National Liberal Party - and the Social Democrats (PSD). Such a polarized combination transformed into a political fiasco, augmented by the financial crisis that harshly hit the country. Currently, political scandals mark the domestic affairs, where impeachment proposals, votes of no confidence, erroneous pieces of legislation, and an increased popular unrest point towards a country that does not yet seem to have been achieved a satisfying level of democracy (Marian and King 2010).

1.2 *The electoral systems*

Theoretically, there are no major differences between the two systems, they are both proportional systems. The main difference between the new system and the old one is that at the 2008 parliamentary election the electorate voted for the person, rather than the list. Instead of voting for the party, citizens voted for candidates within their assigned electoral colleges. This shift was supposed to have implications on who gets on the party lists (in many cases popular persons at the local level - some of them without a clear political affinity – people who would be able to get votes), on how political campaigns are developed, and on how the candidates-elected maintained their contacts with the constituency, on the one hand, and the party they represent, on the other.

According to Article 3 of the electoral law number 373/2004 on the election of the Chamber of Deputies and Senate, seats were allocated proportionally within each of Romania's 42 constituencies, resembling the territorial and administrative division into counties. This meant a minimum of four Deputies and two Senators per constituency. Additionally, seats were

allocated for representatives of ethnic minorities, on the condition of them gathering the necessary amount of votes. Each eligible voter could cast one vote for the Chamber of Deputies and one for the Senate. Candidacies could be proposed only by parties or political alliances, on lists, with attention for the representation of both genders. Parties, political or electoral alliances were restricted to provide only one list per constituency. Independent candidates were allowed to run for election only if they passed the threshold of five per cent support from the total number of registered voters in the constituency where they run. For a political party to be able to get into the Parliament, an electoral threshold of five per cent had to be passed, meaning, parties had to get the support of at least five percent of the overall eligible voters in the country.

In March 2008, the Chamber of Deputies adopts the revisited law project on the election for the Chamber of Deputies and for the Senate, which switches the electoral system from a PR with closed lists, to a mixed-member proportional with SMDs. The new electoral law was initiated by 17 Deputies and Senators, from all the represented parties in the Parliament at that time: the Social Democrat Party (PSD), the National Liberal Party (PNL), the Greater Romania Party (PRM), the Democrat-Liberal Party (PD-L), the Democratic Magyar Union of Romania (UDMR), the Conservative Party (PC), and with the support of some of the representatives of ethnic minorities: the Association of Macedonians in Romania, the Association of Italians in Romania, and the Union of Armenians in Romania. The initiators articulate three new improvements that the law “should” bring about: shortening the gap between citizens and legislators, by introducing the vote in single member districts; for the first time in the history of Romania, this law proposes the representation of Romanians living abroad, by providing them with two mandates for Senate and four for the Chamber of Deputies, under the same electoral rules. The third improvement acclaimed by the law refers

to the prevention of electoral fraud through electoral tourism, since voting would be possible just in the single-member district where a voter had been registered (Exposition of Motives, Law no. 35/2008). The above noted technical details about the formal rules are meant to provide a comparative approach to what was versus is permissible and at stake for political parties and for individual candidates.

1.3 Definitions of concepts and indicators

Since network analysis is a field in its own, the vocabulary one uses in this field is quite unfamiliar to the general public. Therefore, a glossary list of the main concepts and indicators used in this thesis seems necessary in the very beginning, so that following the procedures I use would be flawless. The definitions are customized to the particular use of the terms for this analysis.

Social network analysis is both a theory and a methodology for the study of complex dependency relations between people. In this thesis, I use social network analysis primarily as a methodology (for a more elaborate discussion on the reasons for using SNA as a methodology, see Chapter IV, section 4.2 Methodology). There are two most important parts of a network: the nodes and the ties. In this study the **node** takes two forms, depending on the focus of the analysis. It can be either a legislator, or a legislative proposal (depending on the data discussed – 1- or 2-mode data). The **node attributes** are characteristics of the nodes. In this study, I use the party membership, the committee membership and the constituency membership as categorical attributes for the legislators (nodes). I also use attributes such as centrality measures (degree, betweenness, density) as attributes for the networks of legislators.

The second component of the network is represented by **ties** that link the nodes/actors together. For the purpose of the analyses, I have chosen to consider legislative proposals as ties/links between pairs of actors, because they are quantifiable objective observations (for a detailed account on the reasons for choosing initiated legislative proposals as links between Members of the Parliament, see Chapter IV, section 4.1.1 Why Sponsorships?). In the Romanian system, MPs initiate/sponsor legislative proposals, usually backed up by signatures of members of the same party (when there is a strong party alignment), or members of other parties if there is an issue-based interests, or a personal one.

Concerning the data I use, there are two types that I deal with: affiliation and co-affiliation matrices. An **affiliation matrix (2-mode data)** is a table that consists of the names of the legislators in the rows, and the names of legislative proposals they initiated in the columns. It essentially reveals who initiated what proposal. The **co-affiliation matrix (1-mode data)** consists of legislators, as rows, and the same legislators as columns. It therefore shows the collaboration ties of each MP with all the others. Mainly, it contains information on who collaborated with whom in the Parliament.

Inside a network, one can closely observe and describe the sub-group networks (smaller partitions, with specific characteristics). A **clique** is a network subset, in which some actors are more closely connected to one another than to other members in the network. A clique analysis is useful in seeing timely developments of collaborations inside the parliament, clusters of cohesive groups. This is interesting because there might be homogeneous groups of members from the same party initiating together, or there might be mixed members from different parties, collaborating on different grounds than party membership.

Among the measures of a network, the **geodesic distances** represent the shortest path between two nodes in the network. This is relevant for measuring its density. **Betweenness centrality** shows how many of the shortest paths between second and third actors go through an actor. This measure helps identify the “best” nodes in terms of the geographical position they have in the network. In other words, by computing betweenness centrality, one can find out which nodes play an important role in the way information spreads in the network. Without these key actors the network will suffer of information interruption. **Degree centrality** – the number of direct connections of a node. Actors who have more ties may be in advantaged positions, because they are less dependent on other individuals. Appendix 1 accommodates a Glossary of the concepts, indicators, and the techniques used in the analysis.

CHAPTER 2. PREVIOUS STUDIES

The novelty of the study can be found in more than one area. First of all, previous literature on legislative behavior focused on the hierarchical structure of the Parliament (Lancaster 1986), the competing principals' theory, the institutional effects, or the party unity effect on the behavior of legislators (Carey 2007; Carey and Shugart 1995). These studies are informative, yet limited, failing to address aspects such as strategic moves in collaboration networks, or power relationships at the horizontal level. Second of all, there is a growing literature on policy networks, but its focus does not tackle the problem of electoral system change. It rather puts emphasis on the process of legislation making during a specific time, and under specific political, economic, and social realities (De Bruijn and ten Heuvelhof 2002; Haus and Sweeting 2006).

Third, the most prominent authors of political networks studies with a clear focus on legislative networks are James Fowler and his colleagues (Fowler 2005; Fowler 2006; Fowler and Laver 2008; Tam Cho and Fowler 2010; Zhang et al. 2008). However, their studies test hypotheses concerning network topology, social network analysis theories, or specific network methodology aspects and problems. This paper adds to the legislative behavior literature the methodology of network analysis, and to the network science literature the macro-political aspect of electoral system change. The contribution of this study then resides in the methodological approach to understanding legislative dynamics in the context of electoral reform and in the empirical analysis that reveals its dynamics over time.

In the literature on electoral systems, two perspectives have been tackling interpretations of party dynamics in different electoral systems: rational choice institutionalism and cultural

modernization theories. The first is based on the assumption that politicians are rationally responding to institutional constraints, looking to maximize votes, get office and shape policy (Strøm and Müller 1999; Pennings and Lane 1998). Rules have multiple consequences on the most important aspects of voting behavior, from patterns of party competition, to the strength of social cleavages and party loyalties, and levels of electoral turnout (Norris 2004). The second works on the assumption that deep-rooted cultural “habits of the heart” arising from the process of societal modernization rather than sheer rationality drive politicians (Norris 2004).

Cultural modernization theories suggest that the process of societal modernization has profound consequences for the political culture, with new forms of citizen politics arising in postindustrial societies. The theory predicts that there will be marked contrasts in the mass basis of electoral politics evident in industrial and postindustrial societies, notably in the strength of social identities and party loyalties and in patterns of electoral turnout. Political elites and citizens are driven primarily by affective motivations and by habitual habits of the heart, rather than by the strategic calculation of rule-based rewards. Electoral engineering has limited capacity to generate short-term changes in political behavior, although reforms will probably have a cumulative impact in the longer term as new generations grow up under different rules (Norris 2004).

Electoral systems that encourage competition among legislative candidates within the same party for personal votes are thought to enable disunity relative to closed lists election rules (Ames 1995; Golder and Stramski 2010; Hix, Johnston, and Iain 2010). John Carey (2007) provides an account of measuring party behavior by looking at individual politicians’ behavior and how they drive towards party unity or disunity in different electoral systems, as

an indicator for party behavior. He claims that the competing principals' theory is based on the fact that institutional factors shape whether, and to what degree, legislators are accountable to their party leadership as well as to pressure from other principals whose demands may conflict with those of party leaders (p. 92). "When more than one actor (principal) controls resources to influence legislators' votes, divergence in the demands of these principals will reduce legislative party unity" (Carey 2007, 93). Voting unity is lower in systems where legislators are elected under rules that promote intraparty competition than in systems with closed lists. Therefore, one should expect that in a PR system with closed lists party unity to be higher and legislative parties to be more cohesive than in a MMP with SMDs system, because politicians are more accountable to the central party leadership, as the main principal that has the necessary resources to control individual politicians in furthering their careers or getting them into office (Carey 2007). Further, in systems with elected presidents, governing parties would experience more disunity, and their legislative losses are to result from more cross-party voting than in the other system (Carey 2007).

Even though the empirical evidence so far have not shown a systematic and clear change towards more accountability of politicians to voters when switching from PR with closed lists to a MMP with SMDs system, intuitively, the link between citizens and their representatives elected in geographically based SMDs provides local communities with a voice in the nation's affairs. Thus, this type of reform would also make legislators directly accountable to the electorates in their constituency (Norris 2004). In the latter system, legislators are more prone to turn to constituency service based on a personal vote, rather than being under the direct autonomy of the central party leadership, while in the PR with closed lists one should notice parliamentary discipline within programmatic and cohesive legislative parties, due to the

power of the party leadership over the nomination and renomination of candidates that leads to rational legislators to maintain party unity (Norris 2004; Carey 2007, 2009).

Depending on one's understanding of efficient government, there are two opposite conceptions of accountability: one suggests that an efficient political system is that which maximizes government accountability, by having disciplined programmatic parties and identifiable policy mandates; the other, in contrast, suggests that such a system widens the gap between legislators and their voters, while the alternative brings political affairs to the local level, where citizens have a clear view of what their representatives are doing for them, and therefore can meaningfully assess their performance and holding them accountable at elections (Norris 2004; Carey 2009, 2007; Carey and Shugart 1995). However, the main counter-argument comes from the proponents of cultural modernization theories. They suggest that the adoption of SMDs would not generate similar behavior in different parliaments, because predominant values, ideological beliefs, and institutional customs are deeply rooted and socially determined and therefore differ from one society to the other. Moreover, in democratic systems, parties and individual politicians do not have the power to counter social tides or to change patterns of mass political behavior in the electorate (Norris 2004).

Typically, the literature has been divided between classifying the formal rules, deducing certain consequences, and analyzing the evidence from aggregate election results held under different systems; and analyses of how voters respond to the electoral choices, based on evidence from individual-level national surveys of the electorate and on experiments or focus groups, often studied within each country or region in isolation from their broader institutional context (Norris 2004). In addition to this, two sets of methodological approaches

have been preferred so far: first, studies that are based on formal modeling (Downs 1957) have the advantage that they formulate clear propositions, evidence is easy to evaluate, and they are more or less consistent in measurements. Through deductive reasoning, scholars using formal models produced substantive findings, helpful for understanding party behavior. It seems however that they fall into the trap of parsimony, vastly simplifying possibly mistaken assumptions (e.g. the total instrumental rationality of political actors, mainly individuals).

The second type of methodological approaches focus on extensive empirical studies, from case studies to large-N analyses based on national survey data. These contributions usually fall short of external validity or ecological fallacies. Large-N studies ignore country-specific variables, and the regression coefficients used typically have large standard errors and a lot of unexplained variance between countries. The country-based empirical analyses, even though take into account variables specific to the respective countries, cannot separate confounding factors in assessing behavior change. Time-series analyses still face shortcomings when trying to model time homogeneity, and laboratory experiments, even though very good at detecting mechanisms of causality, isolate too much the elements of study, that end up being hardly realistic (Norris 2004; Freedman et al. 1978). Further, studies using roll call data have increased in numbers (Clinton, Jackman, and Rivers 2004; Anderson, Watts, and Wilcox 1966; Snyder and Groseclose 2000). However, one of the acclaimed problems with inferring parliamentarians' behavior by estimating from past votes is that of selection bias. If parties influence members' votes, then voting patterns appear from endogenous preferences of parties, and not of individual MPs (Kam 2001).

A third type of studying social networks has been focused on constructing statistical models based on probabilities and estimations to derive inference about network dynamics. The actor-based models analyzed in this literature concentrate on different aspects of the endogenous and exogenous variables that can influence the dynamics of the networks and the behavior of the actors. Starting from analyzing simple single theories regarding the utility function of social relations in a network (Bala and Goyal 2000; Hummon 2000), these models have grown in complexity to be able to account for gradual changes (Price 1976; Barabasi and Albert 1999). Attention has been also given to more detailed network characteristics, such as closure, transitivity or reciprocity; these models however fall short of controls for confounding factors (Wasserman 1979; Wasserman and Iacobucci 1988; Kossinets 2006). The latest strives for more precise models have driven scholars to construct stochastic actor-based models that are more flexible in considering actor-driven micro-mechanisms influencing tie formation and controls for confounding factors. Such models use network longitudinal data, mostly small-size directed networks (Snijders 2001; Snijders 2005; Snijders, Bunt, and Steglich 2010).

Columbia University's Bureau of Applied Social Research, with the most notable contribution of Lazarsfeld, Berelson and Gaudet's study on the 1940 American presidential election (1944), set a new, provocative, and promising framework for studying voting behavior. The "sociological" approach of the Columbia school was among the first studies to focus on the "socio-structural and social-interactional effects of voting behavior" (Eulau and Siegel 1981, 499). Carl Scheingold, in his paper *Social Networks and Voting: The Resurrection of a Research Agenda* (1973), pointed out that because of the lack of social network data, the "sociological" model soon fell into disuse (Scheingold 1973; Eulau and Siegel 1981). In the past years however, scholars of different social science traditions acknowledged the

usefulness of network data in survey research and other subfields of political science (McClurg and Young 2011). With the increasing number of recorded objective data, scholars have now the means to pursue research concerning questions that refer to the social aspect of the individuals under study. With such a focus in recent political science research, much knowledge has been generated about a number of factors that have previously been ignored. Juggling with the structural aspect of political behavior as a dependent variable or independent variable, with individual- as well as group-level effects, scholarship has shown evidence of valid and reliable measures of political behavior (Eulau and Siegel 1981; Snijders 2005; Snijders 2001). In other words, “the utility of social network analysis in studying contextual effects seems confirmed” (Eulau and Siegel 1981, 509).

My research design differs from these previously constructed models, however building on knowledge generated by them. An actor-based model cannot account for the networks I chose to look at. First, the networks are larger than typical networks studied with such models. Network panel data are another key variable, which does not fit my design, partly because of the time frame I chose (two legislatures, where the composition of the networks changes get up to 40% newcomers), and partly because of the intrinsic nature of such political networks (the institutional constraints are more or less clear, making the probabilities of tie formation float around characteristics of the actors, such as party membership, constituency membership, committee membership, etc.). Second, the relations I chose as ties between the legislators result in undirected networks, while the actor-based models work extensively with directed networks, mainly because it is easier to calculate probabilities of tie formation or termination once one knows the possible outcomes. For undirected networks this key aspect is missing. Adding to this the actors’ attributes, the result is very hard to estimate. Even though this stream of literature seems plausible and sound, it cannot account for large, undirected

networks, with a significant change in composition. Efforts however are constantly put into dealing with such networks (Preciado, Snijders, and Lospinoso 2011; Huisman and Snijders 2003).

This thesis does not aim at being yet another study that confirms the utility of social network analysis in political science. But rather it aims at showing a novel way in which social network analysis, as a methodology, can be used in generating knowledge about a narrow topic within political science and political behavior: legislative behavior.

Zhang, Friend, Traud, Porter, Fowler, and Mucha (Zhang et al. 2008) wrote a study that focused on legislative behavior, using social network analysis. They analyze the United States Congress by constructing networks between Members of Congress based on legislation that they cosponsor, between 1979 and 2004, from the 96th Congress to the 108th one. Then, they identify the community structure of Congressmen based on their collaboration relationships on the same legislation, to investigate the collaboration communities in both chambers of the Congress. Their analysis shows explicit measures of political polarization, demonstrating a sharp increase in partisan polarization that culminated in the 104th Congress (1995-1996), when the Republicans took control of both Chambers (Zhang et al. 2008). The authors emphasize the usefulness of a network approach to studying the legislature, claiming that using social network analysis as a methodology one can spot not only the obvious behavioral tendencies, but also the importance of positional advantages some legislators hold (Porter et al. 2007) without specific political knowledge about them (Zhang et al. 2008). Zhang et al. use the idea of “modularity” to investigate the organizational structure of Congress. The method of modularity measures the number of intra-community versus inter-community edges for a given partition, so that it can be used to quantify the increase in polarization in the U.S. Congress directly from the network data, without specific information about the ideology or

political orientation of the legislators, the committees they are part of, or the legislation they initiate (Zhang et al. 2008).

Their results yield that “the partisan balance in each committee (i.e., the numbers of Democrats and Republicans) typically reflects the partisan balance of the whole chamber” (Zhang et al. 2008, 2). To identify network communities they hypothesize that a community should have more internal connections among its nodes than connections between its nodes and those in other communities. In other words, they look at particular clusters in the legislators’ networks, and see to what extent they observe collaborations within party lines, or across parties for 13 networks for each chamber. Through visualizing their networks they find that the partitioning does not lie precisely along party lines. “Our analysis picks out known moderate Senators who collaborate more with members of the opposite party, confirming recognized political behavior without incorporating any specific knowledge about their political orientations” (Zhang et al. 2008, 2). Among the results they find that collaboration communities correlate quite well with party, region, and committee membership (Zhang et al. 2008). They also identify a group of Southern Democrats that consistently cosponsor with Republicans. Their results validate the use of the network-modularity method and suggest that it is possible to derive ideology measures from collaboration data in spite of its known high dimensionality and different institutional rules (Zhang et al. 2008).

My research design resembles much of Zhang’s and his colleagues’ study. I also analyze legislative collaboration networks based on sponsorship of the same legislation among MPs, and I also detect communities and observe their composition and dynamics over time. However, the differences between these two approaches are many: first, the authors above noted are analyzing the United States Congress, in the context of a two-party system, while I

look at a multi-party system and the interaction between six to nine legislative parties in a country with far more different political history, culture and context as the American one. They have a dataset of cosponsorships between 1979 and 2004, while I collected a dataset of sponsorships (cosponsorship does not exist in Romania) for four years (2006, 2007, 2009 and 2010).

I use slightly different techniques and my analysis is much more complex than the one presented by Zhang and his colleagues. Besides, their goal is to measure political polarization and to show that social network analysis as a methodology works. My aim is different, and it resides in measuring the effects of electoral reform on legislative behavior by analyzing legislative community structure and dynamics. However, as I show later, the techniques converge towards almost the same results as in the case of the United States, but with far different implications for Romanian politics, and possibly for the study of electoral systems, party systems, and legislative behavior. Zhang's article serves in my thesis as a confirmation that the method works, irrespective of the country under analysis. As long as data is available and scholars can build the maps of collaborations among legislators, the method of social network analysis should show convincing evidence of recurrent patterns.

CHAPTER 3. RESEARCH QUESTION AND HYPOTHESES

This thesis aims at answering the question *how did the collaboration relations among Romanian MPs change in light of the electoral reform in 2008?* The assumption that the behavior of the MPs is affected by the change in the electoral system is supported by previous studies found in the literature on legislative behavior and electoral systems, as noted in the section above (Carey 2009; Carey and Shugart 1995). Most explanations of legislative behavior claim that MPs are primarily purposive (Owens 2003; Mayhew 2004).

In order to achieve their goals, they typically join and work within political parties – because parties offer the possibility of structured collective action with like-minded copartisans, instant access to and identification with a brand name that can enhance electoral prospects, provide them with potentially significant legislative resources, including promotion to committee and leadership positions, and influence over the distribution of patronage. (...) Additionally, (...) being a member of the governing rather than the opposition party or coalition offers significantly greater benefits (Owens 2003).

This quotation indicates not only the envisioned importance of party membership for legislators, but it also points out the fact that MPs rationalize their purposes for action in terms of benefits. According to this kind of judgment, legislators would typically act in a way that would help them achieve personal preferences, be them support, votes, office, or career related benefits.

In dynamic social research, attitude change has been intensively studied. One of the major topics of investigation is attitudinal change. Lazarsfeld, Berelson, and Gaudet (1948) theorize that one of the main reasons for people changing attitudes is cross-pressure from different social affiliations they have. “Individuals do not belong to one group only. They have a variety of major social affiliations: their social class, their ethnic group, their religious group,

the informal associations in which they participate. These various affiliations will make conflicting claims on some individuals” (Lazarsfeld, Berelson, and Gaudet 1948, xiv). In a discussion of general voting behavior and attitude research, this might hold. However, when discussing the behavior of legislators, other assumptions should be considered. Legislators too have political attitudes. They also vote. The vote they cast is different though; more frequent, more decisive (the competition is stiffer, the stakes are higher, and the population is smaller; thus the relative importance of a legislative vote increases). For the purpose of this thesis, I further make an analogy of legislative votes and the act of initiating proposals, arguing that more or less the same mechanisms should work for both these phenomena.

Let us consider the multi-group affiliations of MPs. First and foremost, there is the party (for the majority of MPs). One very important assumption is that party matters. In the party machine, the legislator is prone to control, punishment and reward by the central party organization, by different party leaders and pivotal players (Carey and Shugart 1995). Second, there is the specialized committee group. This is a group in which every MP is assigned a position (due to the institutional design of the Parliament). Members of each party work together on a common expertise field like education, health care, transportation or foreign affairs. Here, the common denominator is the expertise in the field, and conflicting or uniting solutions to problems may appear, according to a general view of what is best for the target population or for the whole population; ideological views then might come to conflict. There is also a third group. In the PR system, before 2008, this group consists of common electoral circumscriptions (counties, in Romania). MPs from similar circumscriptions might compete for initiating special bills that they think would best represent their voters. In the post-2008 system, these areas can further be narrowed down to the single member districts. Intuitively speaking, this should be an even stiffer competition, if the assumption is that voters can see,

experience and measure what their MPs have actually done for them. So the legislators' conflicting ideologies and interests might intervene.

This theoretical model should hold only if political preferences of MPs are stable, and if party affiliations and ideologies are strong enough as to determine them to initiate proposals in particular patterns. A close analysis of groups and subgroups in Chapter VI will reveal what are the main preferences of the legislators, and if cross-pressures determine them to change according to the bills they initiate.

Thus, the first hypothesis is that:

H1: A switch from a proportional representation system with closed lists to a mixed-member proportional one with SMDs should exhibit more cross-party collaborations

I test this hypothesis by looking at the characteristics of the collaboration relationships among MPs for a period of four years, 2006, 2007, 2009, and 2010. My expectation is to observe the necessary network modifications along these years that led to less collaboration along the party lines under the PR system, and more cross-party collaboration after the reform. This means that the network characteristics should show a trend towards more diverse party clusters of MPs initiating proposals together. However, this should not be understood in absolute terms. The first signs of such a shift should be seen at the level of relationships among legislators, since these relationships are the first to be affected by the electoral change. This is why I am looking at the initiated proposals of MPs and not at the final vote aye or nay.

MPs might change their minds between the times they initiate a piece of legislation and the time of the vote, so initiated proposals represent their first-time motivations. They imply working ties among legislators, negotiations and agreements concerning the proposal, its format, and its justifications. Moreover, using the final vote as indicator of party unity (Carey 2009) does not take into account initial sincere motivations of MPs for proposing a certain piece of legislation. Voting also means possible sanctions with which the central party leadership can punish a legislator for not keeping the party alignment on specific issues. Nonetheless, knowing that a proposal might have little chance of passing loosens the threat of sanctions on MPs. Therefore, more cross-party collaborations are expected to form.

One of the key actors to be looked at in my analysis are the so-called ‘opinion leaders,’ mainly the leaders of the party, of the committees, the most connected people (who have the highest betweenness scores). “Opinion ‘leaders’ are more precisely opinion ‘brokers’ who carry information across the social boundaries between groups. They are not people at the top of things so much as people at the edge of things, not leaders within groups so much as brokers between groups” (Burt 1999, 37). “Individuals with contact networks rich in structural holes are the individuals who know about, have a hand in, and exercise control over, more rewarding opportunities” (Burt 1999, 49). The flow of information from the leaders to the rest of the group will be studied. Particular network structures offer these leaders better control over how the information is spread in the network (vertical communication). A less hierarchical structure makes communication travel faster from one group to the other through the structural folds and direct contact of members from different groups (horizontal communication), but it does not necessarily mean that the information will get to everybody. By communication I mean information about the intended purposes and goals of the party as a whole, the general consensus in every group concerning particular problems (e.g. consensus

on initiating a specific education bill, or a health care proposal, tailored by the party's expressive and instrumental goals in a particular time frame – short-, mid- or long-term).

The crystallization of political attitudes of MPs should to a certain extent reflect commonalities of each MP in the group “above and beyond opinion leadership. (...) When prior attitudes exist, mutual interactions will reinforce them; when no prior attitudes but only vague feelings exist, mutual interactions will crystallize these feelings into definite opinions” (Lazarsfeld, Berelson, and Gaudet 1948, xxiii-xxiv). Since the discussion here refers only to legislators, the second part of the quote does not apply, because opinions are assumed to already be in place for each MP (Miller and Stokes 1963). According to these beliefs and opinions, the legislators benefit of more or less support from the party of the people. However, changes in behavior can still occur, and the question is why. Possible answers can stem in the lack of support from the party, weak control and punishment and reward mechanisms for the citizens to hold their MPs accountable, conflicts within a group, or simply conveying to a new ideology for its possible solutions to the problems seen by the legislator. A more clear answer can be drawn from the empirical analysis of the data.

The second hypothesis is as follows:

H2: Due to the direction of the electoral reform, the density of collaboration among MPs should increase from 2006 to 2010

According to Carey and Shugart's (1995) model of electoral formulas and their relationship to incentives of candidates to campaign on a personal rather than party reputation, one should expect that collaboration relationships will be less dense in the PR with closed lists system than in the MMP with SMDs. First, because in the first system MPs respond more to the party

leadership as the main principal controlling the resources of selection and re-selection of candidates, financial means of campaigning and ranking on the party list. Second, because in the latter system, the personal reputation of the candidates is more important than the party reputation giving the candidates more freedom in initiating collaboration relationships. Therefore, one should see an increase in density of collaborations from 2006 to 2010.

CHAPTER 4. DATA AND METHODOLOGY

The study of legislative behavior through social network analysis is relatively new in the political science literature. Because of that, there is a significant lack of networked data that researchers can use. Usually, because collecting one's own datasets is costly and requires time, scholars contend to sociometric data, collected from surveys or data already available from such projects. Trends in giving increasing importance to networked data push towards the inclusion of network parameters in surveys (like egocentric questions), or towards recoding sociometric data as to fit network analyses. However, relational data, as any other types of self-reported data, are also subject to reliability issues, and hence inferences request very careful explanations and justifications (Freeman, Romney, and Freeman 1987; Eagle, Pentland, and Lazer 2009). With the increasing availability of “passive” data sources, like the Internet, phone and computer logs, etc., “objective” data should encourage scholars to also look at them (Lazer 2011).

Between May 2010 and January 2011, I collected a networked dataset for the Romanian Parliament, which consists of the names of the Deputies in office in 2006, 2007, 2009, and 2010, and the legislative proposals they have initiated during these years. From the point of view of network analysis, the dataset thus collected is relevant – it looks at the structural characteristics of relationships between interdependent actors. This simple information about Deputies and the initiated legislative proposals reveals facts about collaborative relationships inside the Parliament, and about their structural realities. I look at legislators as the nodes in the network, and at initiated legislative proposals as the links between the nodes. The approach in political science towards studying political networks is becoming more and more important because of the tools developed by network scientists that are able now to upgrade

the concept of networks from the level of simple metaphorical constructions to fully quantifiable entities. They retain information about the sometimes hidden structural aspects of collaboration. These aspects will therefore be studied in the paper through objective data, unbiased by self-reporting, or other subjective methods of gathering information about the units of observation. I consider the initiated proposals to be a valid proxy for the behavior of legislators. Thus, I argue that network analysis provides feasible methodological tools for understanding party dynamics and legislative behavior.

4.1 Data

To be able to better understand the topic of my research and to reliably and validly fill in the gap in the literature, I collected my own dataset, using sponsorships (initiating a legislative proposal) as ties among the nodes (legislators). The dataset consists of two types of data: affiliation (legislator-by-legislative proposal) data - this type of data helps identify ideological attachments and interests; and co-affiliation (legislator-by-legislator) data that is helpful in identifying collaboration clusters inside the Parliament (according to party lines, ideology, or interests). Boundary specification is usually a problem in collecting networked data, because one single node has the power to totally transform the network if it is included or excluded (Perliger and Pedahzur 2011). Therefore, looking at the whole population of legislators in the Romanian Parliament seems to be the solution to boundary specification problem. For the year 2006, the affiliation matrix accommodates 994 legislative proposals; for 2007, 914 initiated proposals (the constant number of deputies in the 2004-2008 legislatures was 325 plus another 22 deputies that finished their mandates in between these two years, but who were taken into account when the data were analyzed). For 2009, the matrix accommodates 722 legislative proposals; the number of deputies in the matrix is 333 plus another 3 that

finished their mandates in between these two years, but who were taken into account when the data were analyzed. The affiliation dataset consists of binary relationships between legislators (MPs) and legislative proposals (LPs), where the relation is represented by sponsorship. In other words, one set of items is represented by the legislators (rows), and the other set by LPs sponsored by each legislator (columns). The matrices representing the affiliation data only show the presence or absence of a relation: 1 – there is a relation; 0 – there is no relation. The co-affiliation dataset consists of relations between two legislators if and only if they sponsored a bill together.

Table 1. Example of affiliation data

	LP1	LP2	LP3	LP4	LP5	LP6	LP7
MP1	1	0	0	1	1	1	0
MP2	1	1	1	0	0	0	0
MP3	1	0	1	1	1	0	0
MP4	0	1	0	1	0	1	1
MP5	0	0	0	0	1	1	0

LP = legislative proposal; MP = name of the legislator

This table should be read as follows: In year X, legislator MP1 initiated the legislative proposals LP1, LP4, LP5, and LP6, but did not initiate LP2, LP3, or LP7. Using NetDraw, an extension program of UCINET, below I show the graphic representations of the affiliation and co-affiliation networks for the four years under analysis, to better visualize changes.

Based on the typology used by Siegel (2009) to examine collective action in the context of different network structures, I expect that the legislative networks in my thesis will reflect the ‘Opinion-Leader’ type of network. Siegel’s typology, even though it was constructed for a slightly different purpose, collective action and individual political participation, is still relevant for this study for two reasons: first, it examines the importance of network structure

for collective decision making, while paying attention to individuals in the networks, and second, it looks at the interaction between network characteristics and individual motivations.

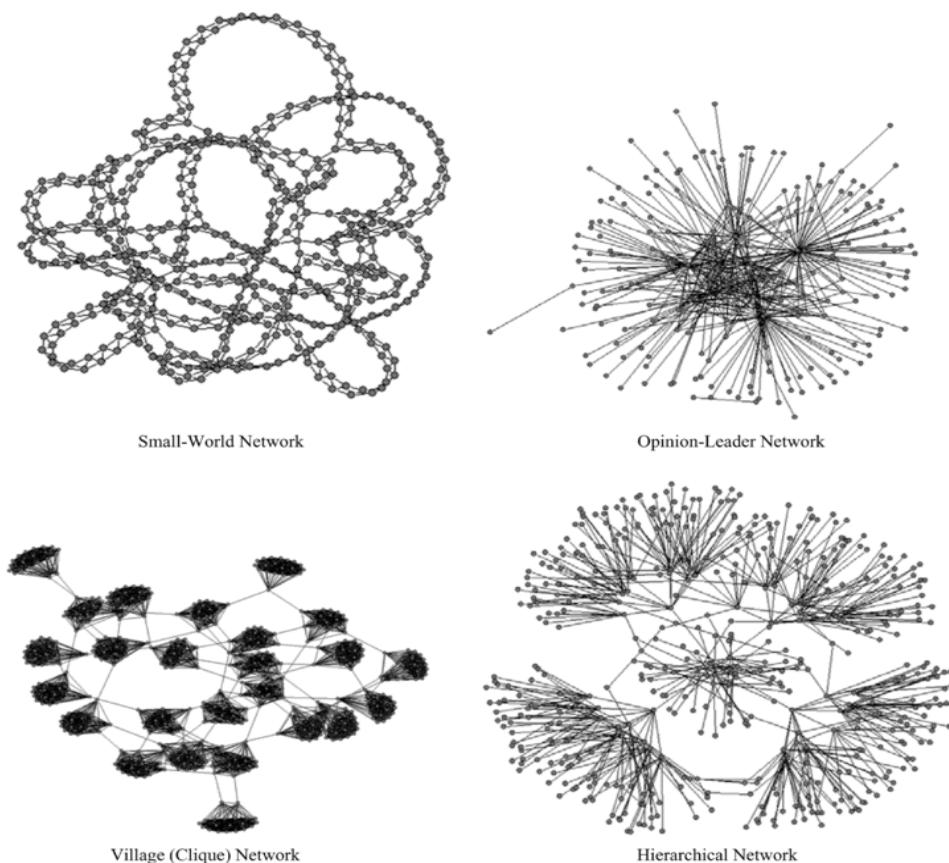


Figure 1. Siegel's Network Typology (Network Visualizations) (Siegel 2009)

Siegel finds that in the small-world network, initially conceptualized by (Watts and Strogatz 1998), participation is high, information spreads fast, mainly through strong ties. This is not far away from what Tam Cho and Fowler (2010) found in their study on legislative networks inside the U.S. Congress. Their findings suggest that the productivity of the legislature increases in a small-world type of network, due to a very smooth path for communication.

The opinion-leader network, as represented in the top right of Figure 1, shows several leaders who work as hubs in the network, having many connections. Obviously, besides the structural advantage that these nodes present, in terms of being able to influence a higher number of individuals as the rest, they also pertain the substantive advantage of controlling resources

available for those under their influence. When elites have low motivations, there is less participation, and vice versa.

Figure 2 below displays the affiliation networks (legislator-by-legislative proposal) for the years 2006, 2007, 2009 and 2010. The red circles represent the legislators, and the blue squares represent the initiated legislative proposals. The isolate circles on the left are legislators that did not initiate any proposal in that particular year. The isolate squares on the left represent legislative proposals that were not initiated by MPs. They could have been initiated by the government, as it is the case in all the four years. In 2006, only 47.7% of the total proposals were initiated by deputies alone or with senators. The rest were either senators' or governments' initiatives. In 2007, 42% of the proposals were initiated by deputies. In 2009, there is an increase of ten per cent, 52% proposals initiated by deputies. Finally, in 2010, there is also a slight increase in the number of proposal initiated by deputies, from 52% to 55%. Another noticeable thing in the graphs is the centripetal characteristic of the proposal initiative process. If in 2006 and 2007 there is a clear polarization of MPs initiating bills together, in 2009 even more so, without any particular cluster sticking out of the graph, to the 2010 very clustered relationships.

The networks displayed in Figure 3 below show several observations. First, there seems to be a trend of increasing collaboration relationships among legislators from 2006 to 2010. Second, traces of cross-party collaboration can be seen in all the networks, some of them appearing to be more diverse and strong in 2006 and 2007, as compared to the 2009 and 2010 networks, where the party clusters are better defined, and cross-party collaborations include the UDMR representatives (Green) and the Independents (Pink).

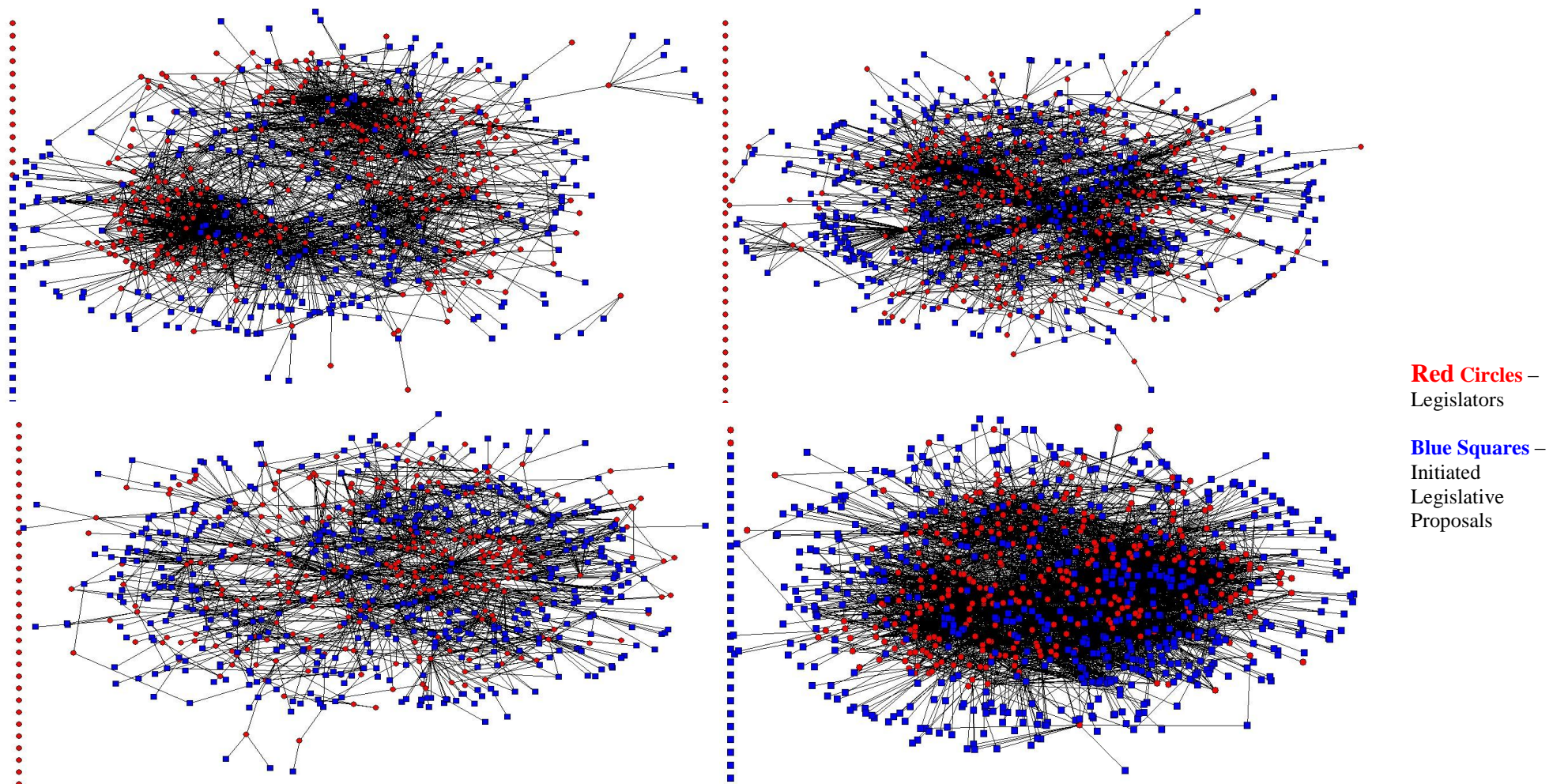


Figure 2. Graphic representation of the affiliation data 2006 (top left), 2007 (top right), 2009 (bottom left), 2010 (bottom right)

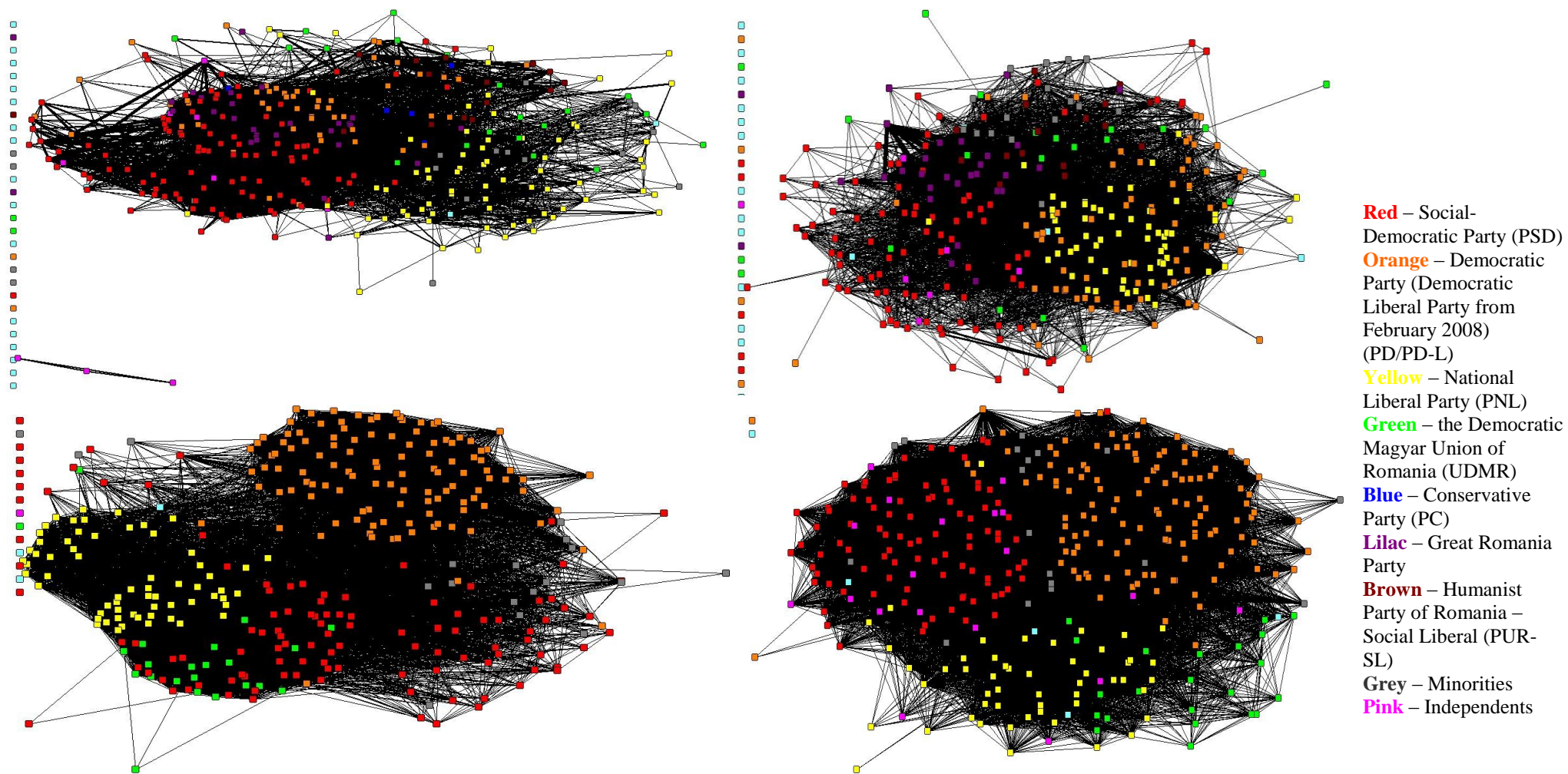


Figure 3. Graphic representation of the co-affiliation data 2006 (top left), 2007 (top right), 2009 (bottom left), 2010 (bottom right)

The co-affiliation dataset consists of relations between two legislators if and only if they sponsored a bill together. The numbers in the cells represent the number of bills sponsored together by every legislator with each other. Following the example in Table 1, an example of co-affiliation data is presented in Table 2. Here, the diagonal values represent the total number of legislative proposals initiated by a MP (e.g. four, three, four etc., for a particular year).

Table 2. Example of co-affiliation data

	MP1	MP2	MP3	MP4	MP5
MP1	4	1	3	2	2
MP2	1	3	2	1	0
MP3	3	2	4	1	1
MP4	2	1	1	4	1
MP5	2	0	1	1	2

MP = name of the legislator

This table should be read as follows: In year X, legislator MP1 initiated a total number of four legislative proposals. MP1 initiated one proposal together with legislator MP2, three proposals with MP3, two proposals with MP4, and MP5.

It should be noted that the number of proposals is not cumulative; in other words, it does not make sense to add up the number of proposals initiated by one MP with all the others, since the characteristic of sponsorship in Romania is that there can be an individual initiator, or a collective group that proposes the same piece of legislation. In order to clarify this aspect let us look at the American sponsorship and cosponsorship. In the U.S. Congress, sponsorship is different from the one in the Romanian Parliament, because proposals can be initiated only by individual legislators. Cosponsorship means that the initiator has to persuade other legislators to sign in support of the proposal. In the Romanian case, the term cosponsorship does not

exist, because proposals can be initiated by more than one legislator (by all the members of a particular party, by members from the opposition, by representatives of the minority groups in the Parliament, etc.).

As opposed to classical statistical approaches to studying behavior, SNA assumes that the actors are not independent from one another, but they co-exist in interdependency. To be able to infer who exerts more influence over whom and why, several criteria must be met. First, as explained above, the more complete the network is, the better. Second, making a decision about what to count as links between the nodes is very important. For example, in legislative networks, counting friendship as ties between legislators can produce very different results than counting a more objective attribute as the links that make legislators form a network. Without engaging in the methodological advantages and disadvantages of either of these options, the decision of the researcher depends ultimately on three things: the research question, the availability of data, and the costs of collecting the data. With this in mind, justifying why I chose to link legislators to one another through the act of sponsorship seems compelling. Probably the most important problem one would always have with networked data is the external validity issue. In an environment where being able to generalize is what counts most in social sciences (King, Keohane, and Verba 1994), claiming that generalizations are almost impossible sounds going backwards. However, criteria for generalizations from relational analyses have found their mile stones in other disciplines like physics, mathematics, or biology, and refer to patterns generated by structural characteristics (Barabási and Crandall 2003; Barabasi 2010).

4.1.1 Why sponsorships?

One of the acclaimed problems with inferring parliamentarians' behavior by estimating from past votes is that of selection bias. Several problems have been spotted with roll call data: first, the availability of the data differs from country to country (in some legislatures votes are systematically recorded for each session every year; in others, there are hardly any votes recorded); second, due to differences in voting rules and the nature of the party competition, analyses of roll call data are hardly comparable across countries. However, roll call analyses have developed in a subfield of their own. Relying on roll call data might hide the aspect of intra- and inter-party differences at the pre-floor stages (Owens 2003). Some studies that use individual roll call votes as the unit of analysis calculate cohesion coefficients based on probability theory (Anderson, Watts, and Wilcox 1966) to allow comparisons across policy issues and parties, but do not account for consensual voting, do not provide individual level party loyalty scores, and are affected by significant statistical biases (Desposato 2006). If parties influence members' votes, then voting patterns appear from endogenous preferences of parties, and not of individual MPs (Kam 2001).

Extending this reasoning to initiated proposals, one can say that MPs initiate particular proposals in response to party pressures of cohesion more than to their own preferences. However, focusing on sponsorships rather than on final MPs' votes to infer about legislators' behavior bares one advantage: a final vote in the Parliament weighs more in terms of consequences than an initiated proposal. In other words, the probability of an MP being punished by the party for dissenting in the final vote is bigger than the probability of him/her being punished for initiating a legislative proposal that has less chances of getting passed in

the Parliament. The latter is a function of the number of MPs initiating the proposal (if assuming that they vote in block to pass that particular proposal – and do not change their minds between the time they initiate it and the time they have to vote on it) and the probability of getting a majority in the Parliament to vote in approval of the bill. Therefore, it can be said that the act of initiating proposals allows for more freedom for an MP to behave according to his/her preferences. It is fair to assume that proposals are initiated by as many members of a legislative party/alliance as possible (for advantage in vote for passing the bill, for persuasion purposes – appearing as a very important bill and a cohesive party, etc.).

However, initiating proposals gives more liberty to MPs to sponsor a proposal based on their ideological preferences or interests, as compared to the act of voting in the plenary. This statement is based on the assumption that policy issues matter for legislative behavior, insofar as MPs would initiate a proposal against their party if the policy proposal reflects their preference. In a discussion connecting MPs' preferences and their voting intentions, measuring the 'wrong preference' is often the case. In looking at the act of sponsorship though, I have no intention of distinguishing between the MPs' personal preferences on policy issues and their electorally induced preferences, because they have a lesser constraining power over the MP, and therefore on the consequences of the act. Nonetheless, by the very nature of social science research, one should be cautious about making claims concerning the level of objectiveness of indicators used to measure behavior.

In a study on the American Congress, Tam Cho and Fowler (2010) focus on cosponsorships of the same bill as the links between two members of the Congress, arguing that:

Cosponsorship embodies a social component by bringing together members of Congress via shared interests or attributes. Electoral connection theories (Mayhew

1974) posit that legislators who cosponsor are ideologically similar or are perhaps linked by electoral security (e.g., marginal versus safe districts). Theories of interlegislative signaling suggest cosponsorship is meant to influence other legislators (Kessler and Krehbiel 1996). Scholars have also used cosponsorship to document links between legislators defined by expertise and budgetary preferences (Gillian and Krehbiel 1997; Krehbiel 1995). Whatever the linking mechanism, a common thread in this literature is that groups of cosponsors share significant experiences and attributes (Tam Cho and Fowler 2010).

The difference between the Romanian *sponsorship* and the U.S. *cosponsorship* terminologies and procedures simply refers to differentiating between who is the author of a bill and who is/are the initiators. ‘Sponsoring’ in the United States means a member of the Congress initiates a bill, but does not necessarily have to be the author of it. ‘Cosponsoring’ refers to not being the author of the bill, but supporting it by signature. In Romania, the sponsors are the initiators/authors of the bill. They can propose a bill both individually or collectively. The latter though is almost always the case in the Romanian legislature. All the documented legislative proposals formulated in the Parliament contain the names and signatures of the initiators (sponsors).

The process of initiating a bill implies close working relationships, since the members that want to make a legislative proposal need to think of all the aspects related to it: design, goals, principles and values on which it stands, target group, mechanisms of implementation, feasibility etc., aspects that cannot be treated superficially if one wants the bill to be passed by the parliamentary commission, and then by the two legislative Chambers. Even if the sponsors are the initiators, but not the authors of the proposal, this still implies a close reading and debate with peers on the proposal, since one would not put her signature on something that goes against one’s ideology, principles or values. What is more, a sponsor would also be interested in working on the bill because of her relationship with the electorate – in other words, it is likely that when sponsoring a bill, a legislator would pay attention that the bill

would not go against the social, economic and political realities in her constituency. Hence, initiated legislative proposals seem fit to represent the links between legislators.

4.2 Methodology

Based on the analysis of the political collaboration networks inside the Romanian Parliament, I follow two ideas. First, I map out the networks of the Romanian Members of Parliament (MPs) in a particular time frame, to see what structural particularities there are and how they are affected by factors such as party membership, ideology, and interests. I am particularly interested in the topology of the networks and the changes they have undergone over time. Second, I focus on the effects the electoral system change had on the networks, more precisely I observe signs of a geographical shift from legislators interested in central party goal achievement to constituency-service politics. The study focuses on the overall network, as well as on a comparison between smaller networks mapped out for specific years (explicit networks for years 2006, 2007, 2009, and 2010). I leave out the year 2008 from the analysis, as I consider it to be a transition year between the two types of electoral systems. By this elimination I allow for the crystallization of the new trends emerging from this change. Problems of selection bias are avoided by analyzing the whole legislators' networks, and not working with samples. Sampling in network analysis conveys important challenges for the researcher (for a detailed analysis of the effects of missing data in network analysis, see Kossinets 2006).

The relational variables can be considered the structure of the network, and the individual attributes the composition. Substantively, the party membership or the constituency membership are attributes that influence the probabilities of legislators forming a collaboration tie. However, as opposed to other approaches that consider analyses of dyads, I

choose to focus on the single individual interaction with immediate small groups. In other words, I look at affiliations of individual legislators to existing groups. This choice is grounded in two reasons: first, the nature of my research suggests network composition is changing between the two electoral systems. The change in 2008 was of about 40% newcomers. This fact indicates that the other 60% of the legislators already have a history of collaboration, while the newcomers try to form ties once in parliament. Therefore, at such a dynamic composition change, measuring dyadic relationships is very hard. Second, Romania has a multiparty system, with the 2004-2008 legislature accommodating nine parties, while since 2008, 6 parties retained seats. What is more, each of the four years considered under analysis contains around 380 legislators. For measuring probabilities of collaboration between each actor according to their attributes requires sophisticated mathematical models and software or very good programming skills. The precision of the results might be high; however, the accuracy of the patterns might be ambiguous. Thus, choosing parsimony over complexity, given the research questions and the data available, seems a reasonable approach.

The software I use in performing the analyses is UCINET, a social network analysis program, with its NetDraw extension, a useful visualization tool. I also employ conventional statistical measures. While performing these measures on network data, inference may appear as problematic for scholars used to traditional statistical analyses, since the standard errors that are computed for interdependent data, while assuming that the data points are independent, tend to be too small. Therefore, inference with linear models is potentially unreliable.

In order to test the hypothesis, I map out the collaboration relationships between similar deputies. How much do deputies coming from certain constituencies initiate proposals with other deputies from the same constituencies? I calculate the centrality measures for the

networks. These measures tell the prominence of certain actors within the network (degree, betweenness, closeness, and geodesic distances). Further, a closer look at the subgroups within the networks is needed, by comparing cliques and cohesive groups inside the networks with attribute data based on constituencies. I also look at the deputy-by-deputy data, which tells who initiates proposals with whom in the Parliament. An important concept here is that of weighted networks. The unweighted networks show collaboration relationships in their simplest form (if A collaborated with B or not). The weighted networks, on the other hand, show the strength of the relationship in terms of how often certain legislators collaborate with each other (i.e., how many times did A collaborate with B). Both these types of networks are of interest in this paper, depending on the assumptions put forward when analyzing them. For example, if I were interested in the strength of the relationship between legislators I can aggregate the data by adding it and get some values. By looking at specific attributes, such as party labels, these values become more meaningful mostly if the assumption is that legislators from within the same party tend to collaborate together more often. Weighted networks will then have a meaningful role in understanding patterns of collaboration, especially cross-party in relation for example to the committee memberships of MPs.

The first of the measures to be used is Freeman's degree centrality and it refers to the number of direct ties a node has. This measure will show the centrality of the nodes, which further indicates towards key actors in the network. Another method employed is betweenness centrality, which shows how many of the shortest paths between second and third actors go through an actor. This measure helps identify the "best" nodes in terms of the geographical position they have in the network. In other words, one can find out which nodes play an important role in the way information spreads in the network. Without these key actors the network will suffer of information interruption. Measuring the extent to which the network

displays clustering means to look at the nodes and their affiliated ties to other nodes. A dense neighborhood of an actor indicates a densely connected node, that plays an important role in the cluster and further in the network. Overlaps will most probably occur, mainly due to the institutional arrangement such as the existence of specialized committees, which are formed of members from different parties working together. This increases the likelihood of MPs to collaborate on grounds of expertise interest (e.g. cross-party collaboration among experts of foreign policy, or education). Furthermore, looking at the sub-structures of the network, one can more easily understand the importance and roles of individual actors that can operate as “bridges” between two clusters, to be able to understand the behavior of those actors.

Further, to test the density hypothesis, according to which the density scores of collaboration networks should increase from 2006 to 2010, I will do a randomization test of autocorrelation for the symmetric co-affiliation matrix, which is partitioned into groups, through the Relational Contingency Table for mixed dyadic relationships with categorical variables. The test relates a dyadic binary variable (in the MP-to-MP adjacency matrix) to a monadic variable (a vector which represents the party affiliation of each MP). The procedure then tests if the collaborations among the MPs are patterned by their party membership. The procedure is similar to performing a standard chi square test, with the exception that the underlying distribution is constructed using a randomization procedure, at the UCINET’s default 1000 permutations (Cliff and Ord 1973).

CHAPTER 5. RESULTS AND IMPLICATIONS

As noted above, I use two types of matrices: affiliation matrix (legislator-by-initiated proposal), and co-affiliation matrix (legislator-by-legislator). I first present the results of the measures computed for the 2-mode data (affiliation data), and then for the 1-mode data (co-affiliation).

5.1 Connections and clusters

The first type of matrix that I look at is the one containing information about what legislator initiated what proposal. These data help identify what pieces of legislation were most important for MPs and which of them enables the most MPs to collaborate together in order to pass that respective piece of legislation. This is relevant to understand what kind of legislation captures the working attention of MPs and to see if it also motivates within party collaboration or cross party collaboration.

5.1.1 Density

First, for the affiliation data I looked at the density of the four networks, in order to see the count of the number of ties, by dividing the raw count by the maximum possible in the graphs. Visibly, the density is increasing, suggesting that each year, MPs initiate more proposals than the year before. The expectation is to have a low density for each network, because in 2-mode data the vertices are not connected among themselves, rather the two modes (legislators and initiated proposals) are two sets, and the density is calculated for the connection between the

two distinct sets. Table 2 shows the density scores for each of the years, and the number of legislators and legislative proposals initiated each year.

Table 3. Affiliation Data - Density Scores

	Density Scores	No. of MPs	No. of LPs
2006	0.0053	368	994
2007	0.0082	367	914
2009	0.0094	336	722
2010	0.0191	336	885

In order to better make sense of the affiliation data, I transformed it from 2-mode data to 1-mode data (co-affiliation matrix – legislator-by-legislator). As opposed to the binary relations in the affiliation matrix, the co-affiliation one displays valued data (number of times a legislator collaborated with all other legislators in the network). For valued data, the density of the networks is the sum of the ties divided by the number of possible ties. The density reveals information about the frequency of collaborations among MPs. Table 3 shows the average density scores for each year and the standard deviation for the co-affiliation data. In 2006, 18% of all possible ties among legislators are present. Something interesting can then be observed for the other networks – the density increases.

Table 4. Co-affiliation Data – Density Scores

	Avg. Density	St. dev.
2006	0.18	0.5735
2007	0.39	1.4709
2009	0.63	1.3481
2010	1.45	2.6379

5.1.2 Geodesic Distances

More information can be extracted from these networks when the distance between actors is calculated. I computed geodesic distances for the co-affiliation matrices. As a macro-characteristic of the network, and following the pattern discussed above for the density, here too the trend indicates towards a shorter distance between a pair of nodes as one goes along from 2006 to 2010. Table 4 presents the results for the average distance among reachable pairs with their respective cohesiveness scores. The values indicate that in 2010 it was easier for two MPs to collaborate together than it was in 2006, even if the difference is not very big.

Table 5. The average distance (among reachable pairs) by year

	2006	2007	2009	2010
Average distance (among reachable pairs)	2.03	1.887	1.697	1.531
Distance-based cohesion	0.41	0.415	0.606	0.728

5.1.3 Clustering Coefficient

Next, to better grasp the “texture” of the networks, I computed the clustering coefficient of each network. Even though the respective densities of the networks showed that they are rather loose networks, the tendency of the legislators to cluster together varies between 11 and 20, thus maintaining low values. In 2006, the overall clustering coefficient is 1.166, and the weighted one is 0.929; in 2007 – 2.101 and 1.907; in 2009 – 1.898 and 1.627; and in 2010 – 2.002 and 1.776. This means that in 2006, the average neighborhood density of a node was 11 ties; in 2007, 21; in 2009, 16, and in 2010, 20.

5.2 Centrality measures

This part of the paper deals with finding out information about important actors in the network. As opposed to the previous section that followed only whole-network characteristics, now, the approach is to look at individual actors as well, in order to understand their roles. Because this paper is about political networks, it is interesting to observe who are the most prominent and powerful actors in the network and what are they for the central party organization. As discussed earlier, one should see a difference from 2006 to 2010 in the collaboration patterns. For the sake of simplicity, I will present just the results of the most important actors as shown by the centrality measures computed. I do not focus on the names of the legislators. Displaying them is only a matter of making a point clear, and not to make inferences about the particular persons with the highest scores.

5.2.1 Degree Centrality

This centrality measure refers to the number of direct ties a node has. The higher the degree value of a node, the more connected this node is to a number of others. In this context, the more legislators a MP is connected to, the more the respective MP developed collaboration relations with other legislators. Table 5 presents the values for the average number of ties a node has (mean), the total number of possible ties (sum), the number of MPs in each year (number of observations), and the overall network centralization. The mean degree centrality for the 2006 network is 67 ties out of 24,852, in a network of 368 nodes.

Table 6. Degree Centrality by year

	2006	2007	2009	2010
Mean	67	142	209	487
Sum	24,852	52,306	70,542	163,794
No. of Obs.	368	367	336	336
Network Centralization	0.031	0.04805	0.05345	0.10386

In 2006, Iordache Florin has the highest degree (degree = 283). He is a member of that legislature's ruling party, Social Democratic Party (PSD), and is the most connected node in the network. For the 2007 network, Pușcă Mircea Valer is the most connected legislator (degree = 844). He is member of the ruling coalition party National Liberal Party (PNL). In 2009, the MP with the highest number of ties is Giurgiu Mircia, member of the now ruling party, PD-L – Democrat-Liberal Party, with 692 collaboration ties. Finally, in 2010, the legislator with the highest degree score is again Giurgiu Mircia (degree = 1,733), from PD-L. These degree scores indicate that these actors formed the most collaboration ties and point to the fact that they can very easily form new ties with other legislators. They are important not only for their position as the most connected MPs, but also for their potential of developing new working ties with their colleagues.

The network centralization measure tells how unequal are the relationships in the networks in terms of the influence actors with a high degree have. In other words, when the network centralization values increases, actors with the highest degree centrality are people who can exert a higher level of influence on their colleagues, due to their advantaged positions which give them access to important others as well as to resources. Overall, however, these are low centralization values, as compared to other types of networks such as Knoke's information network, with a centralization of about 45% (Knoke and Kuklinski 1982).

5.2.2 Betweenness centrality

Betweenness centrality shows how many of the shortest paths between second and third actors go through an actor. This measure helps identify the “best” nodes in terms of the geographical position they have in the network. In other words, by computing betweenness centrality, one can find out which nodes play an important role in the way information spreads in the network. Without these key actors the network will suffer of information interruption. These are the legislators that connect different groups inside the Parliament, either by their influential positions, or by simply the institutional constraint (working in a specific specialized committee). In 2006, the betweenness mean is 138, out of 50,937, in a network of 368 nodes. The network centralization index is 2.32%, a very low value, but an expected one, since this is a large network, and in order to keep the party boundaries, many high betweenness scores would mean that many legislators cross the party boundaries in forming ties with MPs from other parties.

The legislator with the highest betweenness score is Iordache Florin (betweenness = 1,694), the same who had the highest degree score. This legislator seems the most powerful node in the network in terms of information spread, or knowledge share. In 2007, the “best” node in the network is Amet Aledin (betweenness = 943), a minority group representative. The overall mean for this measure is 113, out of 4 1670, in a network of 367. The network centralization is 1.25%. In 2009, Buda Daniel (PD-L) is the legislator with the highest betweenness = 1 697. The mean is 107, out of 36,009, in a network of 336 legislators. The overall network centralization index is 2.85%. Finally, in 2010, the mean is 94, out of 31,841, in a network of 336. The network centralization is the lowest among the analyzed years, 0.88%. Duşa Mircea (PSD+PC – the alliance between the Social-Democratic Party and the

Conservative Party) is the “best” node (betweenness = 583). In other circumstances, such low betweenness values might have been considered a disadvantage (information disruption, highly hierarchical network, for example). Here, however, these indicate a less hierarchical network, more precisely, they indicate an ‘Opinion-Leader’ type of network as discussed earlier in the thesis, in which it is easy to start developing working ties outside the party boundaries. This, nonetheless, might be argued to be a huge disadvantage for the political parties.

5.3 The Density Test

For testing the second hypothesis that density of collaboration relationships should increase from 2006 to 2010 due to the characteristics of the electoral formulas I computed a randomization test of autocorrelation for the legislator-by-legislator data. The results for the Relational Contingency Table (RCT) analysis for each year are reported in the Appendices section (Tables 7 to 10). Before looking at numbers, it is useful to examine the visual display of the networks. Figures 4 to 7 display the co-affiliation networks for the years 2006, 2007, 2009 and 2010 at the subsequent collaboration cut points according to the relevant number of collaborations among legislators.

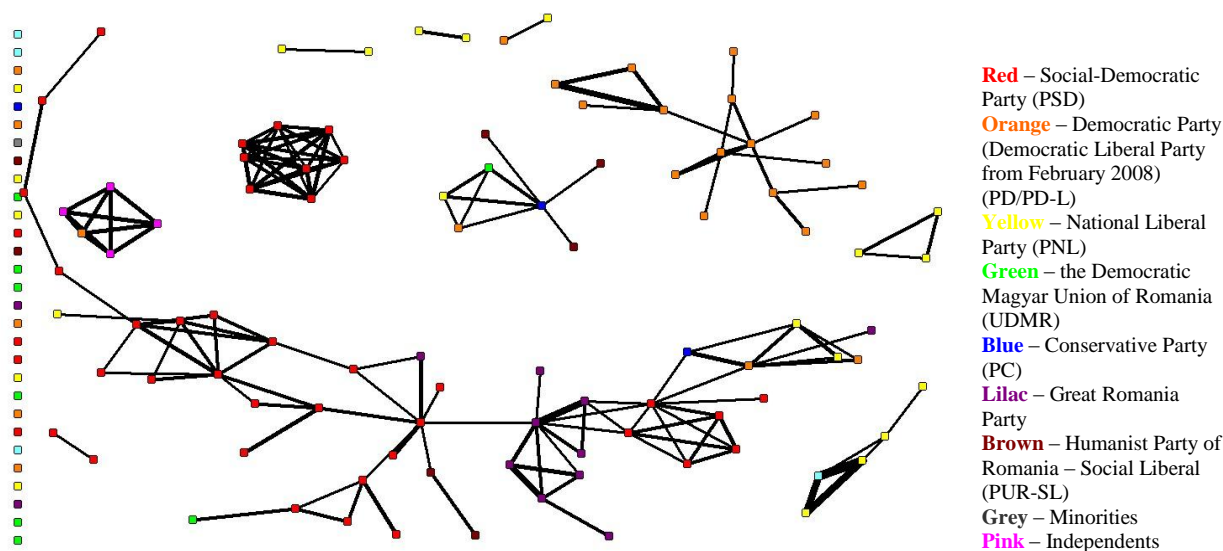


Figure 4. Co-affiliation network with party membership at cut point 4 - 2006

In Figure 4, one can see the weighted network of the MPs in 2006, at five numbers of collaborations on initiating proposals. The thin black line represents the ties between legislators that collaborated five times on initiating proposals together. The thick black line represents stronger relationships on MPs that collaborated together even more than five times. It is five collaborations at a cut point of four because the initial link between two MPs is not counted by UCINET. The isolates on the left hand side are MPs that collaborated less times than the agreed on cut point.

One can clearly see some network structures unrevealed by now by any previous study. Inside the 2006 legislature, one can observe several groups of collaborators: the Social-Democrats (Red) seem to be aligned in a rather modular network, where MPs work in a more hierarchical way, therefore, the string-like shape of the red squares. Three cliques though stick out inside the party, with one of them formed of eight legislators that tend to maintain their ties up to eight initiated proposals together, clearly disconnected from their colleagues. Another obvious clique is represented by some independents (Pink), who at five collaboration ties are disconnected from the main component of the graph (the PSD and others). A third interesting

clique is formed by the members of the Great Romania Party (Lilac), who even though seem to have a strong connection among themselves, they are still connected to the main component of the graph, because of some of their members' repeated collaboration on initiating proposals with members of the Social-Democratic Party. Another component is the collaboration among the Democratic Party's members (Orange). They are also disconnected from the other parties, as a sign of maintaining their party line behavior. However, some interesting characters appear: the orange squares infiltrated in other groups are members of the PD/PD-L who collaborated with members of other parties for at least five times. In this particular network they appear to have been having collaborations more constantly with the independents and the Liberals (Yellow).

The most interesting structure appears in the middle of the graph: the collaboration between a member of the Democrats with two members of the Liberals, with a Hungarian representative (Green), two Conservative members (Blue) and three PUR –SL members (Brown). These strong working ties between members of different parties can be explained by looking at their membership in parliamentary committees. Most of them were members in 2006 in the Committee for Agriculture, Forestry, Food Industry and Specific Services. This seems to suggest that cross-party collaborations might be understood by looking at committee memberships.

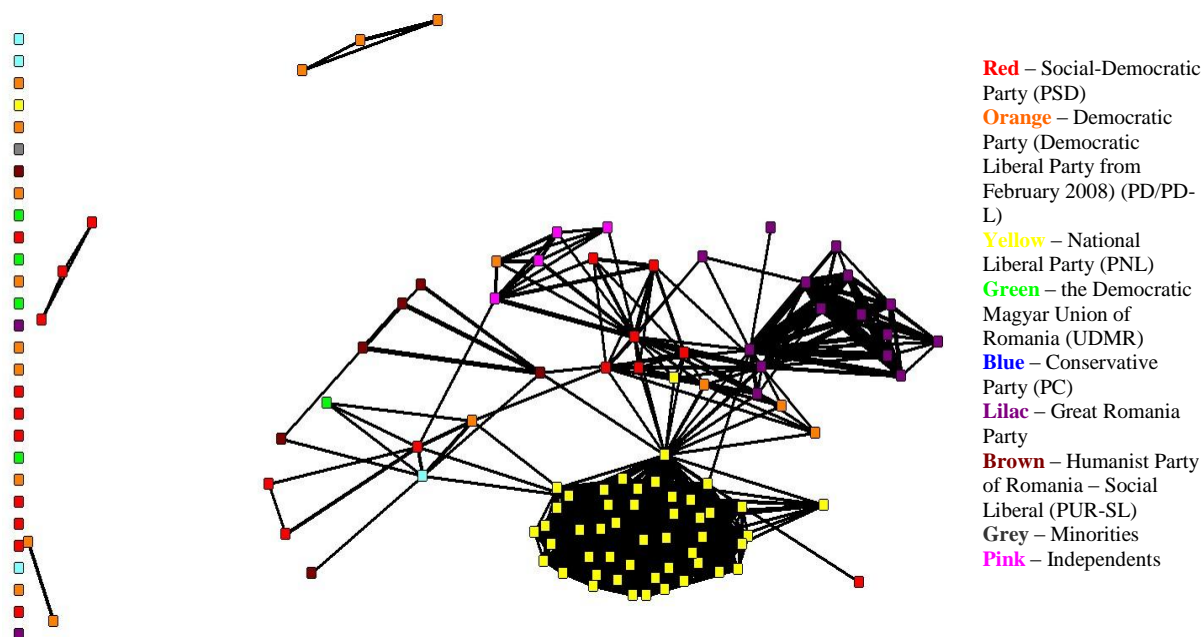


Figure 5. Co-affiliation network with party membership at cut point 7 – 2007

In the 2007 weighted network of collaborations some changes appear. The clear yellow cluster represented in the graph is the National Liberal Party's members. They form a very cohesive bloc, very often going outside the party lines in collaborating with members of other parties. Another rather strong cluster is represented by the Great Romania Party representatives, though, by comparison to PNL, they allow for more collaboration outside the party, typically with members from the Social-Democratic Party or the Democrats. Cross-party collaboration appears between members of PUR-SL, PSD and PD, this structure being connected to the main clusters of the component.

It should be emphasized that this time, the cut point was 7, meaning that the graph represents relationships among MPs at already eight collaborations on initiating proposals. This means that the relationships are very strong, mainly inside PNL which displays a very well connected cluster. In comparison to PNL, PSD lost most of its relationships already at the third collaboration, as well as PD members. Again, the more diverse group in the graph is

represented by members from various legislative parties that are also members in the Committee for Agriculture, Forestry, Food Industry and Specific Services.

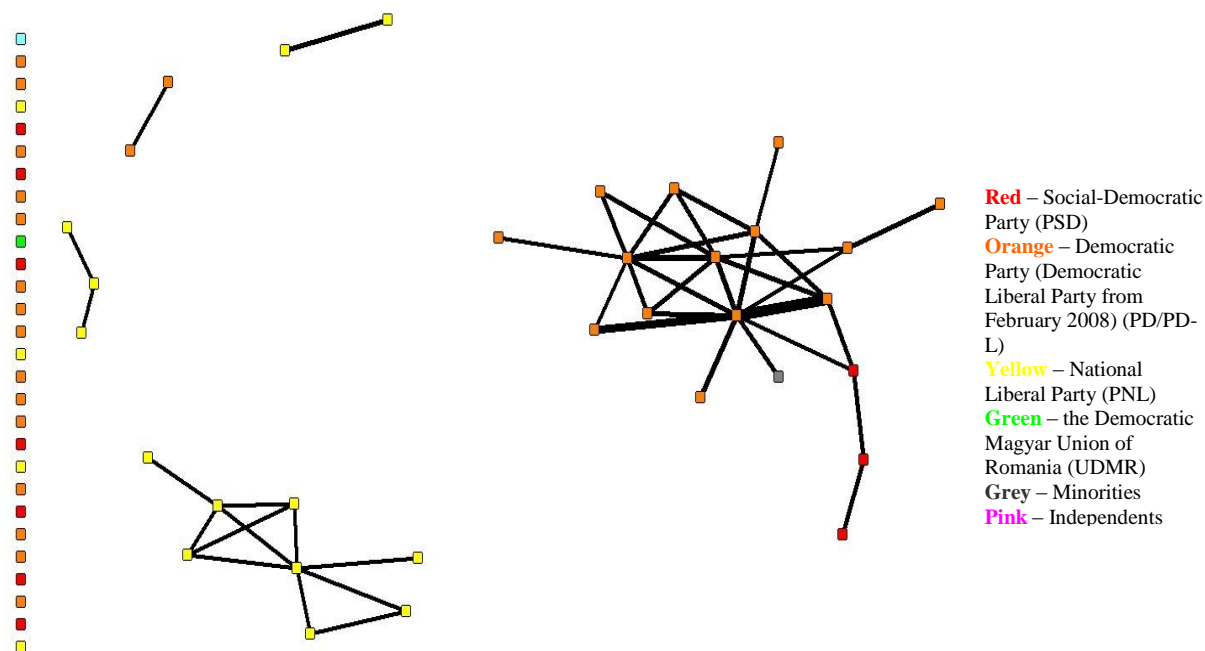


Figure 6. Co-affiliation network with party membership at cut point 9 - 2009

The 2009 network is already part of the new electoral system, the mixed-member proportional with single member districts. The weighted network should display a higher density of collaboration relationships, due to the characteristics of the new electoral system which should encourage them. Figure 6 above shows the collaboration relationships inside the legislature at a cut point of nine, meaning the MPs that appear in the network collaborated 10 times together on initiating proposals. Two main disconnected clusters appear: some legislators from the Liberal Party (Yellow) and some legislators from the Democrat-Liberals (Orange). They are highly interconnected. However, what is striking here is the persistence of three PSD members (Red) and of a minority representative (Grey) connected to the PD-L cluster with which they collaborated for already ten times. Again, membership in the Committee for Agriculture, Forestry, Food Industry and Specific Services explains the strong patterns of collaboration across party lines. What is curious though is the presence of a

minority representative (Grey), the Vice-Chairperson of the Committee for Culture, Arts and Mass Communication Means.

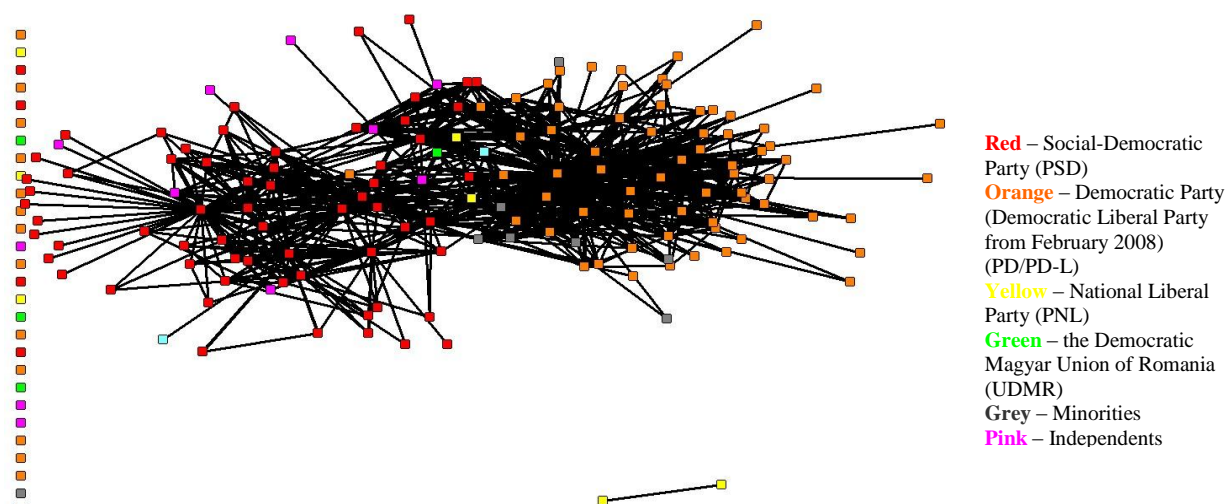


Figure 7. Co-affiliation network with party membership at cut point 10 - 2010

The 2010 graph seems to have the strongest collaboration relationships. The cut point here is nine, which means that the legislators in this network have collaborated for at least 11 times together in initiating proposals. Even at this level of collaboration, one can see the clear clustering of the main two parties: PD-L, the governing party, and PSD, the opposition party. The two are strongly connected to each other. If in the previous networks the strongest cross-party collaboration happened between members of the Committee for Agriculture, Forestry, Food Industry and Specific Services, in 2010 this committee loses strength. In return, other committees seem to enable strong collaboration relationships among MPs from different parties: the Committee for Culture, Arts, Mass Information Means, the Committee for Budget, Finance, and, Banks, and the Committee for Legal Matters, Discipline, and Immunities.

In order to test the ‘homophily’ aspect of collaboration relationships between MPs based on their shared party membership, I computed a Relational Contingency Table analysis. The tables showing the results of this analysis are displayed in the Appendices section (Tables 7 to

10). They contain a table that shows the cross classified frequencies in a contingency table corresponding to the party membership attribute and the legislator-by-legislator dataset; a table which gives the expected values of the frequencies, based on the assumption that the ties between MPs are independent and randomly distributed throughout the groups. A third table reports the observed values in each cell of the first table divided by the corresponding cell in the second table. Further, the observed chi square value is reported, as the square of the observed minus the expected divided by the expected value. The matrices have been partitioned according to the number of legislative parties having seats in each of the years under analysis. One observation in these tables is that the observed frequencies differ from the expected values under the independence model.

The Pearson chi square value for the 2006 test is 2950.329; for 2007, the values is 1465.823; for the 2009 network, 2813.649; and for 2010, 4992.916. The null hypothesis is that there is no change in the density of the networks from one year to the other. In other words, the electoral system change did not facilitate the formation of ties among MPs. Out of the four analyses, only the ones computed for 2006 and 2010 were significant (2006 – sig. = 0.0105; 2010 – sig. = 0.0327), which means that the 2007 and 2009 results could be explained by chance. The observed values for the observations are greater than the expected ones, meaning that the null hypothesis of no change has been rejected. The results indicate that collaboration across parties is not similarly distributed. The chi square test confirms that there was a change in the density of the networks, as the previous analyses showed as well, at least for the years 2006 and 2010.

5.4 Implications

As noted in the beginning of the thesis, my aim here was to map out the legislative networks inside the Romanian parliament for the years 2006, 2007, 2009 and 2010, employing network centrality measures as to detect the main features of these networks. These results are quite similar to what Zhang et al. (2008) have found: the partitioning does not lie precisely along party lines. The stronger cross-party collaborations confirm recognized political behavior (Zhang et al. 2008). Collaboration communities correlate quite well with party, region, and committee membership (Zhang et al. 2008). The above sections have focused on explaining why certain measures are relevant for the understanding of how legislators initiate proposals in the Parliament. The characteristics of the networks were identified in the results section. Thus, the topology of the networks seems to indicate consistent changes between the years and between the two blocs of years under analysis. The first trend indicates that there is an increase in the number of collaborations among legislators from year to year. Another tendency spotted suggests that there is a shorter distance between a pair of nodes as one goes along from 2006 to 2010. It is easier for two MPs to collaborate together in 2010 than it was in 2006, even if the difference is not very big, though the trend seemed to be decreasing between 2006 and 2007, as well as from 2009 to 2010. The clustering coefficient varies between 12 and 27 nodes, a rather low value if the sizes of the networks are taken into account.

The network centralization values tell how unequal the relationships in the networks are in terms of the influence actors with a high degree have. In other words, when the network centralization values increases, actors with the highest degree centrality are people who can

exert a higher level of influence on their colleagues, due to their advantaged positions which give them access to important others as well as to resources. This observation shows that in the PR with closed lists system, MPs seem to listen to the ‘opinion brokers’ (those people with the highest degree centrality), even though they coordinate cross-party collaborations. On the contrary, in the MMP with SMDs system, where the network centralization increases significantly pointing out that these leaders exert even more influence on their colleagues, they also seem to be the ones who maintain party discipline.

Same, the betweenness centrality measures were low. Two different kinds of interpretations can be suggested here: one that conveys that having few individuals that work as relationships intermediaries (brokers) is a positive thing, because the network is less hierarchical, encouraging horizontal relationships. At the opposite pole, one can argue that this weakens party boundaries, because individuals are more prone to easily form new ties with people outside the party. However, as could be seen earlier, these brokers control both the collaborations outside party membership and inside it. Overall, the networks indicate that in the first bloc, MPs formed collaboration relationships more outside the party lines. If one of the basic assumptions of rational choice institutionalism holds, this characteristic is counterintuitive, since one would expect that under a closed-lists system legislators would be more accountable to the central party organization, therefore decreasing the incentives for them to cross the party lines when initiating proposals with MPs from other parties.

Tam Cho and Fowler (2010) find out that the US Congress resembles a small world network. As shown earlier, my results suggest that the Romanian sponsorship networks are more like Opinion-Leaders networks, in Siegel’s terms, rather than the former (the case of the 2004-2008 legislature, with opinion leaders/brokers coordinating cross-party collaborations). The

higher the betweenness scores, the more hierarchical the network is. It is not a Hierarchical type of network though, because, generally, the betweenness scores are low. But the decreasing trend in the data seems to show that the structure of the networks changed from 2006 to 2010, from a network in which some actors play an important part in linking clusters together and collaborating outside the party label, to a network where these play a lesser role in coordinating cross-party collaboration. Another interpretation of this trend, that would follow the rational choice institutionalist approach, can be that the best positioned actors themselves initiate and coordinate cross-party collaboration.

If rational actors, in a system conducive to more control of the central party organization over the legislators, tend to collaborate with MPs from other parties, it might be that policy issues are more important than party label. For such an interpretation, further research might look more in depth into the specific legislative proposals initiated by the MPs; a categorization of the proposals on policy issues and ideological stands might be constructed, which can then be confronted with names and party labels of MPs, so that inference can be drawn as to how much weight do legislators put on policy issues as opposed to party membership in forming collaboration relationships.

In the second bloc, 2009-2010, the networks are less hierarchical, even though the difference is not very big, and party discipline is more frequent. Most of the cross-party collaborations involve the larger independents' group, and the Hungarian minority party (UDMR), but there are fewer traces of counter-intuitive collaborations with MPs outside one's party. This too is unexpected, from a rational choice institutionalist view, because in a mixed member proportional system with single members districts, expectations are that such a system would make MPs less dependent on the central party organization, and more dependent on the local

party organization and other local actors, since the vote-seeking-minded MPs would care more about strategies of collaboration with legislators from the same constituency. However, the data shows otherwise. Put into the Romanian political context, these might indicate that particular political discourses might have split the camps according to party affiliation, decreasing this way the cross-party collaboration. Further research might tackle this problem to a greater extent, by looking at the political discourses, such as media coverage of debates that create polarization among parties in terms of either policy-oriented goals or ideological divisions.

This new approach to the study of legislative behavior emphasizes an alternative way of measurement. When claims about the impact of the electoral rules, as a dependent variable, are discussed, tools of social network analysis can be employed, since networks are very sensitive to structural, institutional change. Proponents of cultural modernization theories suggest that institutional changes will have an impact only on the long run (Lijphart and Aitkin 1994; Lovenduski and Norris 1993). A social network analysis approach indicates that changes of legislative behavior are visible immediately, if proper measurement tools are used. Thus, a direct measurement of legislative behavior has been used, in the context of different proportional formulae. Without making a causal claim, this article presents observations of changes between the two systems, and discusses possible paths to causal inference, by presenting two theoretical lines of thought. Thus, further analyses would be needed, and a different formulation of the research question.

CONCLUSIONS

In this thesis, I analyzed the characteristics of the legislative networks inside the Romanian Parliament. By treating the MPs as nodes and their initiated proposals as links between them, therefore measuring the relationships, I mapped out the networks of collaboration of the Romanian legislature for a period of four years and between two electoral systems – proportional representation with closed lists (2006-2007) and mixed-member proportional with single member districts (2009-2010). Based on the theoretical model that legislators respond to their principals' demands, I proposed another methodological approach to studying political accountability and legislative behavior. John Carey (2009) claims that reforms from collective representation, in a PR system, to individualistic representation in a SMDs system did not show clear evidence in support of changing the electoral system to achieve greater accountability of legislators to their constituents (Carey 2009). This study aimed at exploring this question, and delivering a tentative answer by looking at the most sensitive indicator of legislative behavior – collaboration.

The purpose of this study was to shed light on the elements from where further research should start, combining theories like the principal-agent theory with network methodology. Once these subjects have been clarified, the next step is to rethink some concepts, like redefining political accountability and rethinking strategies of making it work. There are a number of limitations to this approach: first, I almost completely neglected the analysis of the 2-mode dataset, for reasons of time and space. Looking at the big picture, even though the yearly networks that I have worked with are complete, they still samples of the legislatures (2004-2008; 2008-2012).

The computed measures showed some interesting changes in the network structure each year, and between the two sets of years, revealing some information about the collaboration patterns inside the Romanian Parliament. Findings show that there is change in the behavior of legislators in two different electoral systems. It is easier in the mixed-member proportional system to form collaboration ties than in the previous electoral system. However, the observed relationships have the opposite effect than expected, with a less dense network with more cross-party collaborations in 2006 and highly dense with strong party clusters in 2010. The expected party discipline in the proportional representation system (2006-2007) is broken by legislators with a strategic position in the networks, who encourage cross-party collaborations on initiating legislative proposals. Generally, the effect of the electoral reform is weak. This research links network positions to the competing principals' theory, by rethinking agency and its practical implications for party politics.

Even though Zhang et al. (2008) have observed almost the same patterns of legislative behavior for the U.S. Congress as I did for the Romanian Chamber of Deputies, the studies are quite different in their goals. Zhang's article serves in my thesis as a confirmation that the method works, irrespective of the country under analysis. This claim contradicts the idea promoted by cultural modernization theorists, who say that similar behavior cannot be observed in different parliaments, because predominant values, ideological beliefs, and institutional customs are deeply rooted and socially determined and therefore differ from one society to the other. As long as data is available and scholars can build the maps of collaborations among legislators, the method of social network analysis should show convincing evidence of recurrent patterns. In order to test the electoral system effects by using social network analysis, one might look at the case of New Zealand, where in 1994 the

electoral systems was changed the other way around as in Romania: from a mixed-member proportional with SMDs to a PR system with closed lists.

However, the analysis computed in the present thesis is more static than dynamic, mainly due to the size and characteristics of the data set, and because of time and space constraints. For a dynamic analysis a more complex research design is needed, perhaps an actor-based one. However, the size of the networks (quite large), the major composition changes between legislatures (up to 40% from the 2004-2008 to the next legislature), and the undirected characteristic of the networks require advanced mathematical and programming skills. Further, a replication of this study must be done, in order to test the reliability and validity of the results.

Without making a causal claim, this study presented observations of changes between the two systems, and discussed possible paths to causal inference, by presenting two theoretical lines of thought. Thus, further analyses would be needed, and a different formulation of the research question. Further research might look more in depth into the specific legislative proposals initiated by the MPs; a categorization of the proposals on policy issues and ideological stands might be constructed, which can then be confronted with names and party labels of MPs, so that inference can be drawn as to how much weight do legislators put on policy issues as opposed to party membership in forming collaboration relationships.

APPENDICES

Appendix 1. Glossary

Affiliation matrix (2-mode data) – membership or participation data, such as when we have data on which actors have participated in which events; a matrix that consists of the names of people in the rows, and the events they participated in as columns (matrix X_{ij} , where i is the legislator and j the initiated proposal; the cells in the matrix contain a 1 if i initiated proposal j , and 0 if not).

Betweenness centrality - Shows how many of the shortest paths between second and third actors go through an actor. This measure helps identify the “best” nodes in terms of the geographical position they have in the network. In other words, by computing betweenness centrality, one can find out which nodes play an important role in the way information spreads in the network. Without these key actors the network will suffer of information interruption.

Clique – “A sub-set of a network in which some actors are more closely connected to one another than to other members of the network” (Hanneman and Riddle 2005). A clique analysis is useful in seeing timely developments of collaborations inside the parliament, clusters of cohesive groups. This is interesting because there might be homogeneous groups of members from the same party initiating together, or there might be mixed members from different parties, collaborating on different grounds than party membership (personal interests).

Co-affiliation matrix (1-mode data) – this matrix consists of MPs as rows and the same MPs as columns. It therefore shows the collaboration ties of each MP with all the others. Mainly, it contains information on who collaborated with whom in the Parliament

(matrix X_{ij} , where the cells display the weighted relationships between legislators; if i collaborated with j 5 times, the cell ij will display a 5).

Degree centrality – The number of direct connections a node has. “Actors who have more ties to other actors may be advantaged positions. Because they have many ties (...) are less dependent on other individuals. (...) They may have access to, and be able to call on more of the resources of the network as a whole” (Hanneman and Riddle 2005).

Geodesic distance – the shortest path between two nodes in the network. This is relevant for measuring the density of the network.

Node - In this study the node takes two forms, depending on the focus of the analysis. It can be either a legislator, or a legislative proposal (depending on the data discussed, they have different graphic signs – circles represent legislators, in both affiliation and co-affiliation data; and squares represent legislative proposals, only in affiliation data).

Node attributes – characteristics of the nodes. In this study I use the party membership, the committee membership and the constituency membership as categorical attributes for the legislators (nodes). I also use attributes such as centrality measures (degree, betweenness, density) as attributes for the networks of legislators.

Social network analysis – both a theory and a methodology for the study of complex relations between people. In this thesis, I use social network analysis primarily as a methodology.

Ties – For the purpose of the analyses, I have chosen to consider legislative proposals as ties/links among the actors, because they are quantifiable objective observations. In the Romanian system, MPs initiate/sponsor legislative proposals, usually backed up by signatures of members of the same party (when there is a strong party alignment), or members of other parties if there is an issue-based interests, or a personal one.

Appendix 2. Relational Contingency Tables

Table 7. Relational Contingency Table Analysis for 2006 (Co-affiliation and Party Membership)

Observed/Expected										
	1	2	3	4	5	6	7	8	9	10
1	3.56	1.37	1.13	0.91	0.79	1.02	0.95	1.19	1.48	1.05
2	1.37	2.36	0.88	0.76	0.79	0.93	0.91	1.39	1.34	0.97
3	1.13	0.88	1.26	0.51	0.61	0.7	0.65	1	0.95	0.71
4	0.91	0.76	0.51	1.03	0.57	0.66	0.63	0.85	0.8	0.67
5	0.79	0.79	0.61	0.57	1.07	0.78	0.77	1.14	0.67	0.71
6	1.02	0.93	0.7	0.66	0.78	1.64	0.87	1.35	1.08	0.75
7	0.95	0.91	0.65	0.63	0.77	0.87	1.47	0.87	0.79	0.66
8	1.19	1.39	1	0.85	1.14	1.35	0.87	2.37	1.72	1.05
9	1.48	1.34	0.95	0.8	0.67	1.08	0.79	1.72	2.75	1.09
10	1.05	0.97	0.71	0.67	0.71	0.75	0.66	1.05	1.09	0.99

Observed chi square value = 2950.329

Significance = 0.010599

Table 8. Relational Contingency Table Analysis for 2007 (Co-affiliation and Party Membership)

Observed/Expected									
	1	2	3	4	5	6	7	8	9
1	1.76	0.84	0.81	0.82	0.91	0.96	0.18	0.91	0.89
2	0.84	1.54	0.76	0.78	0.9	0.85	0	0.86	0.81
3	0.81	0.76	1.47	0.77	0.9	0.92	0.15	0.79	0.82
4	0.82	0.78	0.77	1.49	0.92	0.72	0	0.79	1.01
5	0.91	0.9	0.9	0.92	1.88	0.97	0	0.89	0.93
6	0.96	0.85	0.92	0.72	0.97	1.86	0	1.05	0.81
7	0.18	0	0.15	0	0	0	0	0	
8	0.91	0.86	0.79	0.79	0.89	1.05	0	1.56	0.9
9	0.89	0.81	0.82	1.01	0.93	0.81	0	0.9	1.77

Observed chi square value = 1465.823

Significance = 0.886711

Table 9. Relational Contingency Table Analysis for 2009 (Co-affiliation and Party Membership)

Observed/Expected						
	1	2	3	4	5	6
1	1.63	0.79	0.83	0.76	0.75	1.05
2	0.79	1.49	0.78	0.78	0.66	0.8
3	0.83	0.78	1.62	0.83	0.69	1.05
4	0.76	0.78	0.83	2.18	0.54	0.35
5	0.75	0.66	0.69	0.54	1.26	1.15
6	1.05	0.8	1.05	0.35	1.15	

Observed chi square value = 2813.649
Significance = 0.486651

Table 10. Relational Contingency Table Analysis for 2010 (Co-affiliation and Party membership)

Observed/Expected						
	1	2	3	4	5	6
1	1.9	0.87	0.82	0.71	0.81	0.87
2	0.87	1.54	0.72	0.68	0.73	0.79
3	0.82	0.72	1.34	0.64	0.67	0.77
4	0.71	0.68	0.64	1.39	0.64	0.69
5	0.81	0.73	0.67	0.64	1.24	0.77
6	0.87	0.79	0.77	0.69	0.77	1.6

Observed chi square value = 4992.916
Significance = 0.032797

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