

Experts at networking?

The Constrained Influence of Experts in Norwegian Policy-Networks

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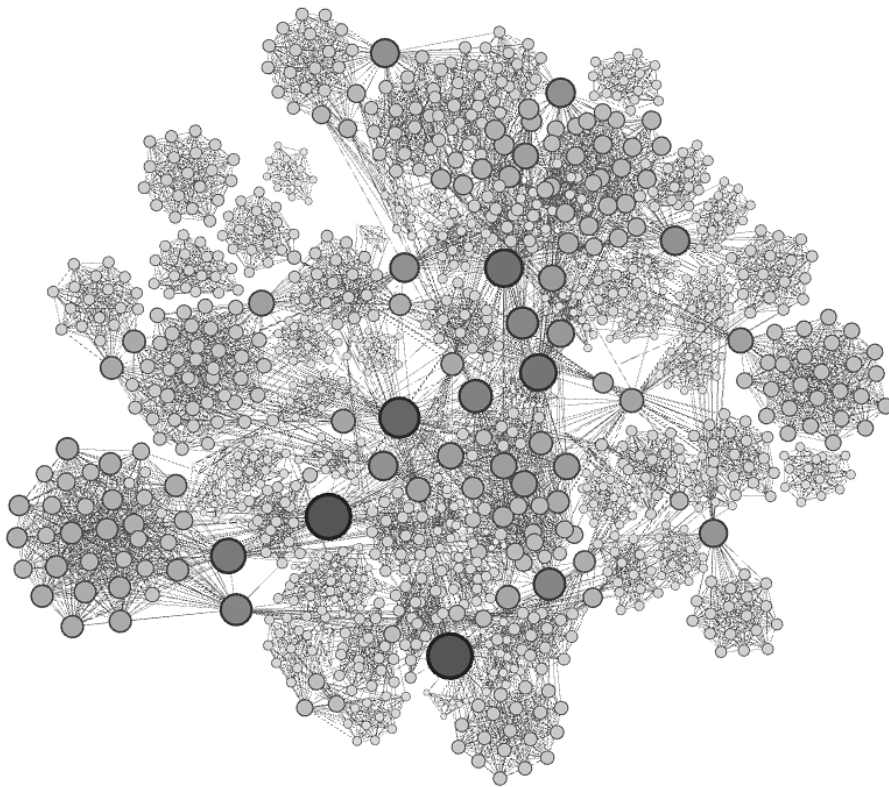
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Abstract

The topic of this thesis is the system of public advisory commissions in Norway (NOU) and the social networks within that system. Analysing the NOU-system as a social network allows for several unexplored questions to be asked with regard to the structure of the network as a whole. Approaching this in an explorative way, the first research question is: In what way has the network structure of the Norwegian advisory commissions changed over time? This is analysed within a Social Network Theory-framework, highlighting tendencies of centralization and cohesion, as well as the aggregated centrality of the network over time. The second question I pose is driven by recent developments of the study of academic expertise in policymaking. I ask: To what extent have experts, compared to actors with other affiliations, gained greater influence over time in terms of structural position in the network? Recent studies have shown that within Norwegian advisory commissions there is a growing number of academic experts, giving this particular societal group increased influence in the policy process. Other than this, the memberships in Norwegian public advisory commissions have traditionally also been occupied by actors with other affiliations such as public officials/civil servants and interest group representatives. Therefore, it is an important task to ask the question of whether experts have become more influential when employing a social-network-perspective, or if the other traditional affiliations occupy the most central positions in the NOU-network. The developments of centrality among the actors in the network is analysed within a theoretical framework of different approaches to democratic governance, namely: a state-centered/technocratic approach, a corporatist approach and an epistemic approach. The methodological framework I utilize in answering both of the research questions, is Social Network Analysis (SNA). In terms of the first research question, the social network within the NOU-system is becoming less centralized and more cohesive over time, and the aggregated centrality is increasing, which is discussed in light of what possible consequences this might have. The analysis concerning the second research question, point towards experts *not* becoming increasingly influential in the network, in spite of constituting a larger share of the members in the within the commissions. Instead, this study shows that in a social-network-perspective, interest group representatives and public officials are the most influential actors in the network.



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1. Introduction

One of the main tasks of the modern state – and one of the main features of politics – is to decide on policy. That is, when we understand politics as the way in which a given society is governed, policy, and the policy process, becomes a crucial aspect of politics. Political decision-making regards virtually all public matters (Birkland, 2016). However, where the line is drawn between what is considered private, and what is public, varies immensely. In the Nordic countries, often characterized as “strong states”, and as “social democratic welfare regimes”, the state intervene more in matters that other regimes would define as belonging to the private realm (Pedersen & Kuhnle, 2017). In other words: the scope of policy-areas is quite large in the Nordic countries, compared to other countries in the world. This makes it even more urgent to ask; who has power in the policy process?

One answer is that the elected political representatives has decision-making power in the policy process. This is true of course, but they are not the only ones. In advanced modern democracies, the range of issues politicians need to make decisions about is simply too comprehensive, and the complexity too large. Not least for this reason, the government, and politicians make use of a large bureaucratic apparatus in which they get advice about policy. Especially in terms of policymaking in the Nordic countries, the political decision-makers have often relied on temporary advisory commissions in order to make well-informed policy proposals or solve policy problems (Arter, 2016). There is a myriad of bureaucratic bodies and procedures that are involved in governance in the Nordic countries, but temporary advisory commissions are among the most central ones, and are considered more central than in other regions. The question that follows then is; who has power in advisory commissions?

For the policy-formulation process to be legitimate, it is important that affected interests are involved, but also that policy is made on the basis of relevant expertise. Advisory commissions – or public commissions of inquiry – usually consist of actors either representing the state bureaucracy, external interests, or expert knowledge of some sort (Petersson, 2015; Christensen & Hesstvedt, 2018). Recently, scholars have sought to determine more specifically, who provides advice to political decision-makers. In Norway, this has been done by studying the member-

composition of public advisory commissions (Christensen & Holst, 2017; Christensen & Hesstvedt, 2018). These commissions are referred to as “Norwegian Official Commissions”¹ (Norges Offentlige Utredninger – NOU), and are one of the primary ways in which the government can carry out research or analyses of societal issues, or propose policy. An increasing number of researchers and academic experts are appointed to these advisory commissions, which might indicate a growing need for academic research and expertise in policymaking. The growing complexity of policymaking, together with high-pace technological change, and the expansion of state functions are only some of the possible reasons for this 'scientisation' of governance (Krick, Christensen & Holst, *forthcoming*). Furthermore, developments in member-composition, citation practices, the affiliation of commission chairs and the deliberations within commission, indicate that experts are becoming increasingly influential (Christensen & Hesstvedt, 2018; Christensen & Holst, 2017; Tellmann, 2016). These indicators are important, but not necessarily exhaustive when it comes to who has influence as a member of an advisory commission.

To be appointed as a member of an official commission in Norway is a prestigious task that puts actors in positions of power in terms of getting the opportunity to influence policy. In addition to this, through commission memberships, they get access to social networks of potentially influential actors. Thus, we can outline two assumptions. First of all, if an actor is appointed to advisory commissions several times, this increases that actor’s influence simply because he/she several times has the opportunity to influence the policymaking-process. Second, an assumption throughout this thesis, is that the positions actors occupy in a network determines how influential they have the potential to be, as a result of how many (and whom) they are connected to (Smith et. al., 2014). Earlier studies of advisory commissions in the Nordic countries, have largely neglected this aspect of the potential power that commission members have as a result of their network-position. The system of Norwegian official commissions (NOU-system henceforth) has existed for a long time, and has recently received increased scholarly attention. My contribution to this field of research is to study the unexplored social aspect of the NOU-system, namely: the latent social networks within Norwegian official commissions.

There are several reasons for studying this institutionalized system in which the government receive advice about policy. For one, the result of the commission work is an official report which in many cases either directly propose new legislation, or at least recommends some sort of policy change to the government. In this sense, the official commissions constitute an important institutional venue

¹ I will also use “official commissions”, “public commissions”, “ad hoc advisory commissions”, or just “advisory commissions” interchangeably throughout this thesis. They are also sometimes referred to as “commissions of inquiry”

for policymaking to take place. If the commission's recommendations are turned into legislation that is passed in parliament, it is not hard to argue that these commissions may have very real consequences for people's lives. For another, and regardless of what happens in terms of policy, these commissions are sometimes given attention in the media, and in this way, shape the public debate. Third, even if the commission reports do not receive popular attention, they often have an important agenda-setting function in Norwegian organizational life and in shaping institutions (Ryymän, 2017). Therefore, analysing these commissions and their members with a network-approach, might give some new insights as to what sort of policy advisory system this is, and the relative importance of the commission members it is comprised of.

1.1 Research questions

The purpose of this study is twofold. First, I am taking an explorative approach to the network structure among the commission members in the NOU-system, aiming at characterizing the network, and discussing the implications of these characteristics. This will highlight the network-aspect of this type of policy advisory system, which has not previously been explored by scholars. Second, and on more theory-driven terms, I am interested in whether experts have become more influential in these networks, in line with what Christensen and Holst (2017), as well as Christensen and Hesstvedt (2018) find in their research. Therefore, I pose two questions relating to the network structure between the members of the Norwegian official commissions, and the influence of experts versus members with other affiliations. The questions are as follows:

1. What characterizes the network structure among members of Norwegian advisory commissions, and in what way has it changed over time?
2. To what extent have experts, compared to actors with other affiliations, gained greater influence over time in terms of structural position in the network?

The first question has two aspects. First of all the point is to characterize the network structure, which can of course be characterized along several lines. As will be elaborated upon in the next chapter, I am particularly interested in the cohesiveness and centralization of the network, as well

as the aggregated network centrality, which are only some of the many ways to characterize whole networks. Thus the first research question relate mostly to the qualities of the network as a whole. The other aspect of the first research question is the temporal perspective, which involves the comparison between early and later years of the NOU-system, thus examining development of the network structure over time.

The second question relates to the role of experts in the network of advisory commission members, and also has multiple aspects. First, the question implies that I will be comparing experts to actors with other affiliations. More specifically, the other types of actors that will be compared to experts are public officials² and interest group representatives. Interest group representatives are of course seen as representing certain societal interests, but also as representing a larger tendency of a corporatist approach to democratic governance. The public officials are seen as representatives of a more state-centered and technocratic approach to governance within these commissions. Academics bring in research and scientific expertise, and their presence and influence indicate a more knowledge-oriented and “expertocratic” approach to democratic governance. Consequently, even if the actors in the network are individuals, I argue that it is reasonable to regard these actors as group members, and bearers of different approaches to democratic policymaking. In this way, when we take a close look at the network positions of different actors in the network, this does not only tell us something about their potential influence as individuals, it also tells us something about the extent of influence of the state bureaucracy, interest groups, and academic expertise. Second, the temporal perspective is also included in the second research question, making it possible to study the development in different actor’s structural position in the network over time. For this thesis, I make use of a detailed dataset comprising 45 years of commission members. This presents a unique opportunity to study changes to the NOU-system over time with regard to commission member influence. Third, one of the strengths of social network analysis is that it measures a way of being “important” that cannot be studied in any other way. Compared to previous research on member composition in terms of the affiliations that are represented, I go one step further by not only looking at representation, but whether the affiliations that are represented tend to have advantageous structural positions in the network.

² Public officials will in this thesis also be referred to as “civil servants” or “bureaucrats”.

1.2 Background: experts and networks

1.2.1 The field of network research

When we talk about social networks, we often talk about social media, organizations, crime, politics, or maybe the most common: our friends and family. All of these keywords can be found in research on networks as well. In any of these cases, networks are important because they represent whom we interact with. Whom we interact with is important because we expect that individuals are influenced by the people in their social sphere (Borgatti, Everett & Johnson, 2018, p.189-90). When studying politics, networks are important because through having influence over people, one might also gain influence over political decisions. The field of network research within political science is fairly recent, perhaps even more so with the specific field of policy networks. However, there is a growing literature on legislative networks, particularly in the U.S. (Ringe, Victor & Cho, 2017), and a growing literature on networks in EU-politics (Thurner, 2017), which are categories within the field of policy networks.

Policy networks is a term used to describe the networks comprised of actors dealing with the production of public policies (Fischer, 2017). In most cases, policy-networks are comprised of actors that come together with the aim of solving a policy-problem, because no single actor has the resources or capacity to adequately address the problem alone (Joosse & Milward, 2017). If we look closer at the research on policy networks, we often find that the actors that constitute the networks mostly seem to be collective actors, such as organized interest groups, administrative units, political parties or states (Leifeld & Schneider, 2012; Fischer, 2017). In this thesis, however, the actors that make up the units under study are *individuals* appointed to public commissions. Still, the individual actors are analysed in a broader context, and as representatives of something “larger than themselves”, which I mentioned above. Therefore, this way of studying policy networks is not too far from the standard approach.

In many cases, when studying networks in general, an underlying assumption is that the more people you are linked to, the better (Patty & Penn, 2017). This assumption is closely connected to the concept of social capital, in which the idea is that the social resources actors can utilize determines their social status, and thus, their potential to be influential (Bourdieu, 1986). When studying policy networks, this has an additional aspect. In policy networks, the consequences of being influential are perhaps even larger, because it does not just affect a person’s status in a social context, it might have consequences for political decision-making.

1.2.2 The increased importance of experts

Research and academic knowledge seem to have become more important to politicians. Last year, the government explicitly stated in their proposal for the annual fiscal budget that this would be a matter of priority:

The government proposes a revised long-term plan for research and higher education together with the annual fiscal budget for 2019. Here, three new plans for an expansion of 1,5 billion will be launched... (Ministry of Finance, 2018, p.8, my translation).

The increased focus on research and knowledge is not only with regard to research institutions, it is also becoming more important in policymaking (Boswell, 2009). When the government is in need of policy advice relating to a specific field, one option is to appoint an ad hoc advisory commission. The number of academic experts in the NOU-system has over the last decade increased substantially, and the NOU-system have thus come to represent an arena where scientific knowledge and politics meet (Hesstvedt, 2018, p.382). There are many areas and fields in which one can be an expert, and academic expertise is just one of them. Public officials often have regulatory expertise, and interest group representatives have stakeholder expertise (Grundmann, 2017). When mentioning expertise in this thesis, however, I refer to academic expertise.

Parallel to the increasing importance of expertise in policymaking is the increasing amount of research devoted to the role of academic experts in public policy. In this thesis I focus on the research on the increasing influence of academic expertise within the NOU-system. Earlier research in this field include descriptive statistics on member-composition, measures of the extent of scientific citations, analysis of commission chairs, studies of the deliberations within commissions, as well as normative evaluations of expertise as desirable or undesirable in this context (Christensen & Holst, 2017; Christensen & Hesstvedt, 2018; Tellmann, 2016; Holst & Molander, 2018). In terms of the three former indicators of the increased influence of experts, studies by Christensen & Holst (2017), as well as Christensen & Hesstvedt (2018), show that academic experts are indeed becoming more influential in the NOU-system. They infer this on the basis of the increased share of academic experts in commission, the increasing number of scientific citations in commission reports, and the increased number of academic experts that serve as commission chairs. Also, the growing evidence of the increased influence of experts has sparked a more normatively driven academic focus on the democratic concerns of this increased influence of experts in policymaking (Holst & Molander, 2017 and 2018). As mentioned, the focus of this thesis lies on the characteristics of the

NOU-system as a social network, as well as the potential influence of experts in the network. I present a measure of the potential importance of experts that has never been utilized before, and therefore contributing to nuance the different ways in which actors can be important within in policy advisory systems.

1.3 Outline

The remainder of this thesis is structured in the following way. In Chapter 2, I introduce the theoretical framework. Here, the NOU-system is placed in the context of policy advisory systems and knowledge regimes. This is followed by a clarification of the theoretical implications of treating the NOU-system as a network. Lastly in this chapter, three approaches to democratic policymaking are outlined, which lays the groundwork for how the affiliations of the most influential actors in the network is interpreted. In Chapter 3, I elaborate on the data and methodology used for answering the research questions. In this chapter I start by outlining the research design before moving on to presenting the data, and operationalizing the variables of interest. Furthermore, the methodology of social network analysis is explained in depth in relation to the research design of this thesis. In Chapter 4, I present the results of the analysis, starting with the network level of analysis, and then moving on to the actor-level of analysis. This corresponds to the research questions in which the first question relates to the whole network, while the second question is more directed towards the actors within the network. Chapter 5 is the discussion, where I will return to the results of the analysis, which will be discussed in light of the theoretical framework and previous research on the field. This is followed by a discussion of the limitations of this thesis with regard to the research design. Chapter 6 contains some concluding remarks in terms of the study I have carried out in this thesis, as well as suggestions and thoughts about further research in the field of policy advisory commissions and the social networks they are comprised of.

2. Theory and previous research

2.1 The Nordic model of government: Norway and temporary advisory commissions as a case

The Nordic countries differ somewhat from other advanced democracies when it comes to both politics and policies. This has led scholars to talk about a “Nordic model of government” (Heidar, 2004; Knutsen, 2017). An important aspect of this model is the way in which governments study societal issues, propose solutions in the form of new policy, and then possibly implement this policy. This thesis is focused around the issue of important actors in venues where policies are formed. More specifically, the aim is to study advisory commissions in Norway as a network of potentially influential actors. These advisory commissions have been studied by a growing number of scholars for exactly this reason; they have a significant influence on the policy process both in terms of their agenda-setting power, and in terms of directly affecting policy (Tellmann, 2016, Ryymin, 2017). The individuals that occupy seats in these commissions are therefore potentially some of the most important actors in shaping Norwegian politics. Studying the advisory commissions as a network has never been done before, which is why assessing their ties to each other, as is done in this thesis, is a crucial contribution to this field. The benefits of doing so is that this highlights an aspect of commission member importance that is yet to be explored, as well as the fact that it allows for studying network-level characteristics more broadly. In the following, I will provide the theoretical context in which these commissions are analysed, namely; as a policy advisory system within a knowledge regime, before moving further into the matter of the advisory commissions themselves.

2.1.1 Knowledge regimes and policy advisory systems

In an increasingly complex society, and when facing issues characterized by uncertainty and ambiguity, policymakers need competent advice to propose solutions and make decisions (Campbell & Pedersen, 2014). However, the way in which governments utilize different types of knowledge in the policy process is subject to great national variation. The concept of “Knowledge regimes”, described by Campbell and Pedersen, can be defined as “... the organizational and institutional machinery that generates data, research, policy recommendations, and other ideas that influence public debate and policymaking” (2014, p.3). Furthermore, their argument is that the policy ideas generated by knowledge regimes have national origins. That is, the knowledge regimes, and thus the policy ideas that are prevalent in a Scandinavian country, will differ from knowledge regimes in for example Spain or the US, depending on institutional arrangements (among other things). An important point is that a knowledge regime is largely shaped by the political elites within a country (Campbell & Pedersen, 2014, p.16). The political elites in Norway are the ones deciding that it is appropriate to appoint ad hoc advisory commissions as a way of obtaining knowledge, and getting advice on issues and how to solve them. As such, the NOU-system can be characterized as one of many policy advisory systems within the Norwegian knowledge regime.

During the last decades, increasing attention has been devoted to research on “policy advisory systems” (Christensen 2018; Craft & Howlett, 2013). These systems are an important asset to governments whenever policy advice is needed in decision-making processes (Halligan 1995, p.138). The concept of “policy advisory systems”, however, encompasses a large number of advisory systems, ranging from external consulting agencies and think tanks to lobbyists and partisan political advisors. Therefore, it seems suitable to characterize the NOU-system as a specific type of policy advisory system (see figure 1 further below). Halligan (1995) argues that we can characterize policy advisory systems with regard to the degree of government control. Furthermore, he argues that the advice system can be more or less open to external interests. Lastly, he also argues that the extent to which the advice system is dominated by either governmental forces or external interests is an implication of the prevailing preferences within the political system (Halligan, 1995, p.141). Halligan’s theoretical argument can be applied to this thesis with some additional steps. The NOU-system can be seen as an extension of the state bureaucracy, but as mentioned, several other considerations, such as organized interests and relevant expertise, are taken into account as well. In section 2.3, I elaborate on these competing accounts of democratic policymaking, which will serve as the framework for the later analysis of commission members in the NOU-system.

2.1.2 The Norwegian advisory commissions

The NOU-system constitute a specific kind of policy advisory system, that generates research and policy recommendations, and that might both affect public debate, institutional change, and policymaking. These commissions are appointed by the government, or more specifically, the ministry of which the policy-area falls under. The general task of the temporary advisory commissions is to examine policy problems and propose solutions (Christensen & Holst, 2017). In this way, the advisory commissions inhabit one of the main functions of knowledge regimes; they work as a “sense making apparatus” (Campbell and Pedersen 2014, p.3). This is an important task when politicians face unfamiliar issues. Making sense of wide range of issues is, however, not the only task of the commissions. They also propose solutions to these issues, and in some cases, specific propositions to legislative change. Thus, we often talk about two different types of commissions; policy-preparing commissions (utredningsutvalg), and law-drafting commissions (lovutvalg). In any case, the system of Norwegian advisory commissions has undoubtedly become an institutionalized part of the early stage of governmental policy-formulation, whether the main goal of the commissions is to bring insight to a policy field or to propose legislation.

Thus, it is well established that the Norwegian advisory commissions play an important role in policy-formulation. Not only is this because the advice of their members might lead to implemented policy, but the commissions also have an important agenda-setting function (Pettersson, 2015; Christensen, Mouritzen & Nørgaard, 2009). The Norwegian advisory commissions have become of interest to several scholars, who have recently studied their member composition, both descriptively, and in light of various theoretical views of democratic legitimacy (Christensen & Holst, 2017; Christensen & Hesstvedt, 2018; Holst & Molander, 2018). The member composition in advisory commissions is important because it mirrors certain democratic views on policymaking (Halligan, 1995, p.141). For example, if a ministry appoints a commission to solve a policy problem, they might include relevant stakeholders, politicians, or they might appoint academic experts (or all of the above), depending on what kind of knowledge they want to emphasize in finding a solution. In the descriptive analyses of member composition by Christensen and Hesstvedt (2018), as well as Christensen and Holst (2017), members are regarded as obtaining influence in the NOU-system by occupying a seat in a commission. However, one should expect that occupying seats in several commissions is not only beneficial in the sense that they have a chance to influence the commission reports, but also because of the social networks they gain

access to. Analysing the whole system of advisory commissions as a network, however, requires an additional theoretical framework.

2.2 Advisory commissions as networks

It might not be obvious that analysing the advisory commission members as a network is an appropriate research design, which is why I find it necessary to first thoroughly explain the theoretical foundations of social network theory. Second, my aim is to explain the implications that follow from treating the advisory commissions as a network, and the specific characteristics of this particular network. One concept that I use throughout the thesis is born out of the specific context the advisory commissions are analysed in. I will use the term “NOU-network” to describe the system of advisory commissions and how their members are connected, simply because “network of Norwegian advisory commission members” is a tiresome way of characterizing it. In the third and fourth section, I turn to conceptualizing and discussing actor-level and network-level characteristics.

2.2.1 What are social networks?

Studying networks has long historical antecedents in many fields of research, but within the social sciences, it can be traced back to the ideas of Comte and Durkheim in the 1800s (Borgatti, Mehra, Brass, Labianca 2009, p. 892). They argued that societies comprised of individuals had clear similarities with biological systems in that they were made up of interrelated components. This basic idea, that individuals are interconnected, is still the foundation of social network theory, although several advancements within the field have been made both theoretically and methodologically. The actual application of social network analysis in research emerged in the 1930s, started to appear in research articles in the 1970s, and has gradually become more popular since then (Noonan, Erickson & Zheng, 2018, p.2). The body of theoretical works on the network approach to studying social phenomena is, however, much smaller than the amount of empirical applications (Patty & Penn, 2017, p.148). In addition to this, a typical criticism of network analysis is that it is “just methodology” (Borgatti et al., 2009, p. 893). On the contrary, there are a number of theoretical assumptions made when deciding to use network analysis in a study. The core of these assumptions lies in the assertion that relationships and structure matters (DeJordy, 2013, p.2).

Relationships between individuals matter because they function as channels through which social exchange occur. Structure matters because the particular arrangement of those relationships creates opportunities and constraints that affect not only the actors within the networks, but characteristics of the network itself as well. These two related statements are fairly general in the sense that they are applicable to the various fields within social science. In other words: these statements are not particular to network analysis in political science, but rather applicable to the whole field of social science. In the following I will further elaborate the theoretical foundations of network analysis in the context of the Norwegian advisory commissions. It will become evident that drawing upon different traditions within the social sciences is necessary to fully lay out a theoretical framework for this thesis.

2.2.2 The NOU-network

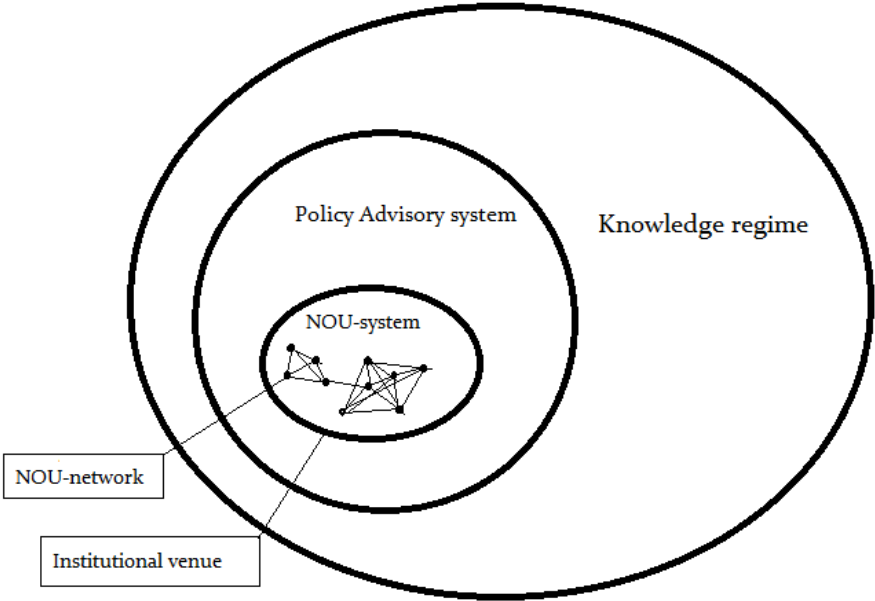
In social network theory, the question of what *type* of network we are dealing with is essential. The NOU-network is a so-called two-mode network. This means that instead of individuals being directly tied to each other, they are indirectly tied to each other through membership in a group (Borgatti et al. 2018, p.267). For example, in their classic contribution to analysing two-mode networks, Davis, Gardner and Gardner (1969), analyse the attendance at 14 society events by 18 women. A more recent example is studying scientific collaboration networks, where scientists are connected to each other through collaboration on a research paper (Opsahl, 2013, p.159). It can make a lot of sense to assume that ties between individuals are present based on shared group-membership, or event-attendance as long as the groups or events are not too large (Borgatti et al., 2018, p.269). Co-attendance at a large sports-event, or co-membership in a large Facebook-group, for example, would not be a good indicator of a social relationship. In our case, seeing as the commissions rarely exceed 25 members, and that the commission work often lasts a fair amount of time, I would argue that it is unproblematic to regard shared commission-membership as a connection between actors.

Another answer to the question of what kind of network we are dealing with, is that we are dealing with a 'policy network'. This concept can be defined as "... networks of (mostly collective) actors dealing with the production or implementation of public policies" (Fischer, 2017, p.833). To be clear, the commission members are not collective actors, nor do they have to be in order to be regarded as the units of analysis within a policy network, but most research on the field treat states, organizations or administrative units as the actors in a policy network. We can therefore characterize the NOU-network as a policy network. Fischer (2017, p.847) further argues that

political institutions have important implications for the structure of policy networks, because they give actors in the network opportunities and constraints for negotiation and cooperation. In the case of Norwegian advisory commissions, one could argue that the system of advisory commissions constitutes the *institution*, the commissions themselves constitute the *institutional venue*, and the commission members constitute the actors of the *policy network*. Leifeld and Ingold (2016) uphold that institutional venues are important opportunity structures for actors to achieve influence. They find that actors that participate in many institutional venues are often perceived as particularly powerful by other actors (2016, p.14).

Drawing upon the characterizations of the NOU-system that have been elaborated thus far, figure 1 below shows the way in which the NOU-network fits into the larger context of institutional venues, policy advisory systems and the knowledge regime.

Figure 1: Characterizing the NOU-system



As earlier mentioned, the commission members that participate in the same commission, and therefore the same institutional venue, work together to produce a report that either proposes specific legislation, or policy advice, depending on the mandate they have been given. In any case, it is not difficult to argue that participation in more than one commission increases an actor’s opportunity to be influential. As mentioned, in the NOU-system we find both policy-preparing

and law-drafting commissions. The commission-work that is carried out in the different types of commissions might be qualitatively different, but as I will elaborate in the next section, I study influence based on social relations rather than what type of commission a member occupies a seat in.

There are different levels of analysis when studying networks. Often, scholars distinguish between actor-level analysis and network/group-level analysis (Borgatti et al., 2018, p.8). In this thesis, both levels of analysis are of interest, which relates to the research questions I posed in the first section. The first question is about characteristics relating to the network as whole, while the second question relates to the commission members. A third common inquiry is to study dyadic social phenomena (relationships between pairs of actors) within networks, but this is not relevant for the research questions at hand. Therefore, in the following two sections, I will first present and discuss the relevant concepts at the actor level, and then at the network level.

2.2.3 Social capital and centrality

The theoretical assumptions about networks being related to concepts such as influence and power, builds upon the notion of social capital. Theories of social capital to a large extent explain why having a lot of social connections is important. In the field of political science, this term is often ascribed to the scholarly works of Robert Putnam. In “Bowling Alone: Americas declining social capital” (1995), he explains decreasing civic engagement among individuals by pointing towards decreasing levels of social capital in American societies. However, the sociologist Pierre Bourdieu relates the term more directly towards networks of power and influence, and therefore the concept of social capital in this thesis will build upon Bourdieu’s definition. Bourdieu defines social capital as: “...the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition...” (1986, p. 248). In other words: the number of social connections an individual has that he or she can utilize. The volume of social capital possessed by an individual thus depends on the size of the network around that individual (Bourdieu, 1986, p. 249). Another noteworthy detail in this definition is that Bourdieu recognizes that the *potential* to draw upon resources from a relationship is enough. The notion of social capital is, however, a bit too broad to precisely capture in what way we identify important individuals in a network, but it is the basis for another important concept, namely; centrality.

One of the most significant contributions to network theory in political science is the concept of *centrality*. Borgatti, Everett and Johnson (2018, p.190) argue that centrality is not one thing, but rather a family of concepts. Indeed, there are many ways to think theoretically about centrality and equally many ways to conceptualize it. Firstly, one could say that the centrality of an actor lies in the contribution that actor makes to the network structure. In this way we are asking: would the network be less connected if that particular actor was removed from the network? Another way to capture the essence of centrality is to ask what advantages an actor has access to by virtue of occupying a particular position in the network. Both lines of thought do, however, tap into the idea of structural importance, or connectedness. It is not a huge leap to move from a notion of having importance in a network to a notion of having influence in a network. The general idea, then, is fairly simple: the extent to which an actor is connected to other actors is arguably a determinant of that actor's influence in the network (Patty & Pen, 2017, p.149). Some scholars take an additional step and equate centrality with power, or at least the potential to exercise power (Grønmo & Løyning, 2003, p.15). The argument is that occupying an important position in a network gives an opportunity to affect a potentially large number of individuals. In this sense the power lies as much in the potential to exercise it, as in actually exercising it. One should note, however, that characterizing actors as influential, prominent or powerful, are not inherently properties of centrality as it is measured (Borgatti et al. 2013, p. 190). These characterisations are rather interpretations of the possible consequences of centrality, in light of theory.

We have now established that there are different ways for actors to be central within a network. Patty and Penn (2017) argue that two general ideas capture the theoretical premises of centrality. The first one can be summed up in the following way: "*The more people you know, the better.*" (Patty & Penn, 2017, p. 149. In other words: the more people you are connected to, the more influential you potentially are. This idea is the basis for two of the centrality measures employed in this thesis, namely; degree centrality, and eigenvector centrality. I will come back to a more detailed account of centrality measures in the next chapter of this thesis. What is important to note here, however, is the distinction between simply being connected to a lot of people, and being connected to a lot of people who are well-connected themselves. The latter is, arguably, an idea that captures influence in a better way than the former, especially seen in the context of advisory commissions. Being connected to a lot of people in this context could essentially mean that an actor is a part of a very large commission. What I am more interested in, is how broad the actor's potential for influence is, which is to a larger extent the result of overlapping commission memberships because this increases the chance of being connected to other well-connected actors.

The second idea of how actors can be central in a network, has less to do with how many people a particular actor is tied to, and more to do with the structural position of that actor. This idea can be summed up in the following sentence: *“The more people you connect, the better.”* (Patty & Penn, 2017, p.150). The relevant measurable concept for this idea is called betweenness centrality, and captures to what extent different actors are connected by a particular actor. In other words, how often the shortest path between two individuals goes through a particular individual (Borgatti et al. 2013, p. 201). To illustrate how the first and second idea of centrality differ from each other, we can consider an example. Person A and B both have connections to 8 people. They are then equally central, according to the first idea presented above, because they are connected to the same number of people. However person A is in one commission with 8 other people, whereas person B is in two commissions with 4 other persons in each. Person B is then structurally more important than person A, because removing person B will at the same time eliminate the indirect connection between the two groups of 4. Removing A, on the other hand, will not have any consequences for the remaining 8 people, except that they lose one connection. This shows how these two ideas of centrality, although they are somewhat overlapping, can have substantial differences when it comes to whom is regarded as central. Further elaboration on the mathematical foundations will be presented in the next chapter.

2.2.4 Cohesion, centralization and aggregated centrality

Social networks or policy networks can be categorized based on a number of attributes. Firstly, *cohesion*³ is an important concept when it comes to characterizing network structure, and refers to the level of connectedness within the network (Hu, 2018; Noonan et al., 2018). Very cohesive/dense networks are usually only found in friend-networks, or other personal networks with relatively few actors involved (Borgatti et. al., 2018, p.175). Therefore, whether a density measure of a network is high or low depends on the context. In the NOU-network we cannot expect that the density will reach the levels of a friend-network, seeing as the actors are only tied to each other if they share commission membership. One theoretical assumption about the consequences of cohesive networks is that high levels of cohesion within a group will encourage information-sharing, collaboration and mutual trust between actors (DeJordy, 2013, p.4). Another assumption is that being a part of a cohesive network will create normative pressure on behaviour.

³ Cohesion is sometimes also referred to as “embeddedness”, or “density” (DeJordy, 2014, p.4)

For policy networks specifically, high levels of cohesion is linked to a higher probability of compromise and consensus in legislative bodies (Alemán, 2009, p.489).

Second, whole networks can be characterized by the degree of *centralization*. The term centralization refers, broadly speaking, to how centrality is distributed among the actors in a network. In the standard approach developed by Freeman (1979), centralization is measured by an index of the difference in centrality from the single most central actor to all other actors. He stated that "... the centrality of an entire network should index the tendency of a single point to be more central than all other points in the network" (Freeman, 1979, p.227). The mathematical foundation of this index is elaborated upon in the next chapter, but the basic idea is to measure the extent to which centrality is evenly distributed among all actors, or if there is one actor that is more central than all others. Some scholars argue that the influence potential for the network towards society gets larger with a more centralized network, than with a decentralized one (Grønmo & Løyning, 2003, p.54). For this particular policy-network of Norwegian advisory commissions, I cannot say whether the commission report was more or less influential towards society based on centralization. For that I would need a measure of the impact any given commission report had, either in terms of adopted legislation, media coverage, or some other impact on society. However, it is possible to describe the extent of centralization and make claims about how influence is distributed among the actors in the network. As elaborated in the previous section, centrality is treated as a proxy for influence, which makes it reasonable to treat centralization as a proxy for distribution of influence.

In the case of the NOU-network, it is perhaps not reasonable, however, to only study the centrality of one actor versus all others. Therefore, measures of aggregated centrality is also employed as a way of studying how centrality is distributed. Here, distribution of centrality then refers to the overall average centrality scores, compared to the different affiliation-groups. This will give us a sense of whether experts for example are more central than public officials on average, or vice versa. Therefore, influence at the network/group-level is studied both as the difference in centrality among the most central actor and all others, as well as the aggregated centrality for the whole networks and the different affiliation-groups within it.

2.3 Competing approaches to policymaking

In this section, I will outline three somewhat competing accounts of democratic policymaking in the context of the NOU-system. The Nordic countries are regularly described as “Strong states”, often referring to the fact that the state bureaucracy is comprehensive, and in large part controls the policymaking process. This view has been contested, particularly by two competing approaches, namely the corporatist account and (more recently) the epistemic account. The corporatist account emphasizes the institutionalized involvement of interest groups in policymaking (Rommetvedt, 2017, p.172). On the other hand, the epistemic account highlights the role of academic expertise (Christensen & Hesstvedt, 2018, p.86). In the following sections I will elaborate the theoretical and empirical foundation for the three approaches, focusing on their implications for the Norwegian advisory commissions. These theoretical accounts relate to the second research question in which I ask whether experts are becoming more influential in this specific policy advisory system. This section will thus serve as the theoretical backdrop for the analysis of potentially influential actors in the network, grouped by affiliation. As such, if civil servants prove to be influential, the state-centered account is strengthened, if interest group representatives are influential, this supports the corporatist account, and if experts seem to be influential, this supports the epistemic account of different democratic approaches to policymaking. Before moving on, it is important to keep in mind is that my aim is not to make inferences about why actors with certain affiliations are chosen for commissions, nor is it to explain specific policy-outcomes as a result of certain affiliations being more or less central.

2.3.1 Corporatism as a defining feature of the Nordic Model

The Scandinavian countries, and perhaps particularly Norway, have since the post-war years been characterized by a strong corporatist tradition when it comes to public policymaking (Christiansen, Nørgaard, Rommetvedt, Svensson, Thesen & Öberg, 2010, p.24). This coincided with a large public sector, and the expansion of the welfare state in all three countries. Corporatism can be defined as “... the institutionalized integration of privileged organized interests in policy making and implementation” (Christiansen et al., 2010, p. 24). This contrasts the idea of pluralism which does not exclude interests that are not *privileged*, in the sense that they are selected among other alternatives, or *organized* in the sense that there are someone representing them. Rommetvedt (2017) upholds that corporatist systems are related to high concentration of both government and private

power, while pluralist systems have low concentrations of both. Moving on, the theoretical arguments for including interest groups and stakeholders in decision-making processes are manifold. First, involving organized groups with specialised, sectoral knowledge might increase the quality of the decisions because they are realistically grounded in stakeholder expertise (Christensen & Hesstvedt, 2018, p.85). Second, when the government allows different interests to have a say in the policy process, the process itself is more likely to be seen as democratically legitimate. Furthermore, including interest groups or stakeholders might increase the chances of successful policy implementation, simply because accepting an outcome is easier when having been included in the process that created the outcome (Christensen & Hesstvedt, 2018, p.86).

More recently, scholars have pointed towards a decline in Scandinavian corporatism since the 1970s (Blom-Hansen, 2000; Christiansen et al. 2010; Rommetvedt, 2017). In the 70s, the highest levels of interest group representation in public committees could be found in Denmark, but there was a steep decline in participation when moving to the 80s and 90s. In Sweden, interest groups were an important feature of the broad commissions of inquiry, but after the 80s, these broad commissions have largely been replaced by single-person commissions (Petersson, 2015, p.658). Norway had lower levels of interest group representation to begin with, but also experienced a marked decline from the 70s and onwards (Rommetvedt, 2017, p. 175). However, the view that corporatism has experienced a major decline in Scandinavia, is somewhat contested. Some scholars argue that while corporatist institutions might have experienced external pressure in recent decades, they have adapted and modernized as a consequence, rather than disappeared (Binderkrantz & Christiansen, 2015, p. 1023). For example, Rommetvedt (2017) points to an increase in lobbying in both Denmark and Norway. There are a number of other views as well, on what trends are evident when it comes to the role of corporatism in the Scandinavian countries. The variety of empirical trends that have been observed within the same timeframe may in part be due to different definitions or conceptualisations of corporatism. In this thesis, I will not make claims about the level of corporatism in policymaking on a general level, but rather about the degree of corporatist involvement in the ad hoc advisory commissions appointed by the government. When it comes to the involvement of organized interests in these advisory commissions, some evidence point towards a decline in interest group participation since the 1970s (Christensen & Hesstvedt, 2018, p.95).

2.3.2 A strong state

Another traditional approach to studying the policy advisory systems in Scandinavia, is the state-centered perspective emphasizing the strong role of the bureaucratic apparatus around the government. The comprehensive professional bureaucracy is one of the defining features of the Nordic model of government (Christensen, Gornitzka & Holst, 2017, p.248). In addition, the relationship between politics and administration is a classical topic in political science that can be traced back to the writings of Max Weber, who devoted much of his work to studying the causes and consequences of bureaucracy in conjunction with politics (Weber, 1946). This relationship is still a highly relevant topic, and the question of how much influence civil servants and public officials have over policy is equally contested (Baekgaard, Blom-Hansen & Serritzlew, 2015). Furthermore, the reasons why bureaucrats might be very important actors in the policymaking process are many. First, civil servants are often the ones filtering information before presenting it to the policymakers, and thus have important influence over the information that gets conveyed. Second, bureaucrats are often the ones actually formulating policy proposals, giving them control over both the problem-definition and the way in which the problem should be solved. In other words, civil servants "... possess and control information, they formulate proposals for policy, and they provide knowledge about feasibility" (Baekgaard et al, 2015, p.461). With a significant amount of control possessed by civil servants in the policy process, it is warranted to ask whether this lives up to democratic ideals. For example, there has been an ongoing political debate since the 70s concerning the representativeness of the bureaucracy, where a political demand for the democratization of the bureaucratic apparatus is evident (Læg Reid & Olsen, 1988, p. 210; Christensen, Egeberg, Læg Reid & Aars, 2014). The civil servants in the Norwegian state bureaucracy do not mirror the general demographics in Norway, particularly because of their high levels of education. This feature does, however, represent another ideal that civil servants should live up to, namely; professional independence (Jacobsen, 1960).

Many different studies have assessed the power of politicians versus civil servants (Baekgaard et al., 2015; Meier & O'Toole Jr., 2006). Yet, when it comes to studying advisory commissions, the comparison between bureaucrats and politicians falls short, simply because other types of actors should be taken into account as well. Christensen and Holst (2017) uphold that the state-centered perspective has an important role with regard to the advisory commissions. After all, not only are the commissions appointed by the government, civil servants also often participate in the commissions as members, secretariats or even chairmen (Christensen & Hesstvedt, 2018). However, in their study, Christensen and Holst (2017) find that the share of commission members

from the civil service has decreased over time, and concludes that this challenges the traditional state-centred account of the Nordic commissions.

2.3.3 Epistemic accounts: the experts are coming

Although receiving increasing scholarly attention during the past decades, the body of work on the role of academic expertise in policymaking remains somewhat fragmented (Christensen, *forthcoming*). Still, it has become clear that it is relevant to talk about a tendency of 'expertization' of policymaking (Turner, 2003). There are several reasons why the epistemic perspective should be given considerable attention when discussing policy advisory systems. With an increasingly complex society, it is not surprising that the government turns to academic experts for advice on problem-solving and public policy (Haas, 1992). One of the reasons for this is fairly straightforward; academic experts are needed because of their specialized knowledge, and ability to understand cause-effect relationships (Christensen & Hesstvedt, 2019, p. 86). This corresponds to what Krick (2015) labels instrumental use of policy advice, in which expertise is needed to find a solution to a problem. There are, however, other reasons for including experts in advisory commissions as well, such as strategic or symbolic reasons. Krick (2015, p.491), states that: "The symbolic use of expertise underpins the authority and credibility of policymakers and their decisions". Thus, the government might include academic experts in advisory commissions to strengthen the legitimacy of the result by emphasizing the objective, scientific knowledge that the policy is based on. Another example of strategic use of commissions is if an expert commission is used as a means to "shift the blame" from the government to the commission, if they know that a political decision will be received negatively by the public (Christensen et. al, 2009, p.22).

Christensen and Hesstvedt (2018) find that the share of academic experts in advisory commissions has drastically increased since the 1970s. In addition, Christensen and Holst (2017) find that commission reports to increasing extent contain citations of academic literature, whereas citing policy-documents remains stable over time. They also find that the number of academic experts among commission chairs has increased during the past decades. With these three indicators pointing towards a growing reliance on academic expert knowledge in policymaking, substantial evidence has been provided for the increased importance of the epistemic account. Furthermore, the findings of Christensen and Holst (2017), and Christensen and Hesstvedt (2018) challenge the corporatist and statist accounts of the Nordic commissions by showing that their participation in commissions has decreased.

Lastly in this section, it is worth considering the criticism this development has been subject to. Increasing political power or influence to academic experts in advisory commissions can be justified by upholding that the knowledge they possess is crucial to the policy-formulation; it is difficult to make political decisions in today's society without relying on expert advice (Holst & Molander, 2017, p.235). Nevertheless, there are some potential issues with this tendency that are worth noting. First, this development poses an intrinsic democratic legitimacy issue (Holst & Molander, 2018, p.358). Democracy is by definition the rule of the people, but in this case one might say we are approaching epistocracy – public policies are decided by “the knowledgeable”. Second, there are also several critiques that set aside the discussion of democratic legitimacy, and focus on the epistemic challenges that arise from the use of scientific knowledge, which to a large extent has to do with the experts themselves. Holst and Molander (2018) present a list of epistemic worries about expertise. For example, experts are often perceived as conveyers of neutral knowledge, but Holst and Molander (2018, p.365) elaborate on how experts are often biased towards their own discipline and can be coloured by ideological views (a fairly recent study shows that academic research in social psychology tends to have a bias in favour of liberalism, see Eitan, et al., 2018, p.188). In addition, and directly relevant for the discussions in this thesis, experts can have an elite bias; it is well known how experts have failed to speak truth to power because they are too involved in the networks of societal elites and so inclined to defend status quo. In the words of Holst and Molander (2018, p.365): “...their connections to the 'establishment' tend to make them more affirmative than critical of the powers that be”. The networks mentioned in their theoretical contribution can of course be of many sorts, and are not restricted to the NOU-network. Still, if the academic experts prove to be particularly central in the network under study, this epistemic worry would arguably be empirically grounded in the NOU-system.

2.4 Theoretical expectations

From the theoretical and empirical contributions to this field of study, it is possible to outline some expectations of what we might find with regard to the two research questions at hand. With the first research question I take on an explorative approach to the network structure of the NOU-system, as mentioned in the introductory chapter. The first question I posed was:

1. What characterizes the network structure among members of Norwegian advisory commissions, and in what way has it changed over time?

This question is difficult one to have any theoretically founded expectations about, seeing as this is the first time any of the Scandinavian advisory commissions and their members have been studied as a network. Still, from what we know about the NOU-commissions it is at least reasonable to believe that it will not be a very cohesive network. This is because, as mentioned, cohesion is the extent to which a large proportion of actors in the network are tied to each other. Since we know that the commissions study specific policy areas, and are appointed by different commissions, it is not likely that the same members will be regarded as suitable members across all these different policy fields. Therefore, the general cohesion is expected to be weak. Yet, we also know that networks with fewer members have a higher probability of being cohesive. Thus, knowing that the number of commissions have decreased over time, we might expect the network to become slightly more cohesive over time. In terms of centralization it is equally difficult to deduce specific expectations from theory on the field, but since there is not a natural leader in the NOU-system, centralization can also generally be expected to be quite low and continue to be low over time, seeing as the lack of leader does not change. Lastly, aggregated centrality is difficult to have expectations about, both theoretically and on the basis of what we know about the NOU-system. Centrality (simply put) is based on the number of connections an actor has to other actors, so aggregated centrality then tells us something about the average number of connections for the whole network, or groups within the network. There is no reason to expect people to be more or less connected to each other over time based on theory or the traits of the NOU-network. However, it is important to underscore the explorative approach to the first research question; the expectations so far are only loosely based on previous research on the NOU-system.

The second research question takes a more deductive approach to studying the commission members. By this, I mean that the findings of especially Christensen & Holst (2017), and Christensen & Hesstvedt (2018) with regard to member-composition in the commissions, work as the starting point for the expectations to what the analysis will show. The second question I asked was:

2. To what extent have expert, compared to actors with other affiliations, gained greater influence over time in terms of structural position in the network?

This question is somewhat easier to have certain expectations about. Building on the empirical work done by Rommetvedt (2017), Christensen & Holst (2017), and Christensen & Hesstvedt

(2018), it is possible to deduce some theoretical expectations concerning the relative importance of commission members in the NOU-network. First, we can generally expect that the corporatist account has been weakened over time, in the sense that interest groups representatives have become less central in the network. Second, it can be expected that civil servants/public officials have become less central in the network over time, weakening the state-centered approach to policymaking. Third, we expect that the epistemic account is strengthened in the sense that more academic experts have become more influential in the network. It must be emphasized, however, that although these expectations are based on the relative increase or decrease of the number of commission members from each-affiliation group as found in Christensen & Holst (2017), as well as Christensen & Hesstvedt (2018). I am analysing something qualitatively different, namely: commission member centrality. There is not necessarily a correlation between the number of members from each affiliation, and how central these members are in the network. Still, if some expectations are to be outlined, building on these empirical findings seems to be a natural starting point.

3. Research design, data and methodology

This chapter is divided into three main parts, covering different aspects of the data and methodology utilized in this thesis. First I will describe the research design in order to lay the framework for how the research questions will be answered. Second, I outline the data at hand, focusing on the variables of interest and the operationalization of the terms and concepts under study. Lastly, I describe the methodology of social networks, both in terms of the general ideas and central concepts of Social Network Analysis (SNA henceforth), as well as more specifically in terms of the case I am studying, namely: the NOU-system.

3.1 Research design

To answer the research questions at hand I will be utilizing SNA. For reasons I will get into later in the thesis, both of the research questions are of a descriptive character. Nevertheless, the descriptive analysis will be followed by a discussion of the potential implications, and in light of the theoretical framework that was elaborated in the previous chapter.

The first research question concerns the characteristics of the NOU-network as a whole, a question I will try to answer by analysing the extent of centralization, cohesion and aggregated centrality of the network over time. There are other measures one can employ when characterizing whole networks, but these three seemed like the most relevant ones for the case of the NOU-network. Assessing centralization, cohesion and aggregated centrality will allow me to make inferences about how the network structure has changed in the last 45 years. In the second research question, I ask whether experts have become more influential in the network over time, or if the other affiliations of interest occupy the most important structural positions in the network. This research question is the one that receives the most attention in the analysis, because it is related to earlier research on the field in the most direct way. To get close to answering this question, a centrality analysis will be carried out, both on the individual level of analysis, and on the group level. The centrality analysis

is thus used both for identifying both a potential structural elite in the network, as well as studying broader tendencies with regard to the most influential actors in the network.

3.1.1 Treating the NOU-system as a network

As mentioned earlier, the NOU-system has been studied before using conventional descriptive statistics, mostly regarding member-composition, but also with regard to knowledge utilization and commission chairs (Christensen & Holst, 2017; Christensen & Hesstvedt, 2018). The approach in this thesis is using network analysis, which has never been done before when studying the Nordic commissions. To be able to study the data with a network-approach, a considerable amount of data processing was necessary. The most comprehensive task was transforming a regular data frame into the matrices representing connections between individuals in the network. This is elaborated below.

The NOU-network as a two-mode network

First of all, it is important to note that the NOU-network under study is a *two-mode network*⁴. Commission members are thus not directly tied to each other, but rather connected via an advisory commission. This has some implications for analysing the network. In one-mode networks, the entities under study in a matrix are the same for both rows and columns, constituting what we call an *adjacency matrix*. In a two-mode network, however, the rows and columns represent different sets of entities, and this is instead referred to as an *affiliation matrix* (Borgatti et. al., 2018, p. 268). For example, a two-mode network can represent students in classes, where students constitute the rows, and classes constitute the columns. Usually, when analysing this type of data, it is a good option to convert the two-mode data into one-mode by post-multiplying the matrix by its transpose, which is done by the following equation:

$$c_{ij} = \sum_k x_{ik} x_{jk}.$$

This allows us to study the direct ties between commission members, in a matrix that will look something like this:

⁴ Also called *bipartite* networks

Table 1: Excerpt from member-by-member matrix of commission members in 2016

	aadne Cappelen	Aase Aamdal Lundgaard	Ada Sofie Austergard	Aksel Mjoes	Alma Kajtaz	Amund Utne	Anders Loevlie	A R
aadne Cappelen	2	0	0	0	2	0	0	
Aase Aamdal Lundgaard	0	1	0	0	0	0	0	
Ada Sofie Austergard	0	0	1	0	0	0	0	
Aksel Mjoes	0	0	0	1	0	0	0	
Alma Kajtaz	2	0	0	0	2	0	0	
Amund Utne	0	0	0	0	0	1	0	
Anders Loevlie	0	0	0	0	0	0	0	1

The diagonal of the matrix simply represents the number of times a given member has occupied a position in a public commission, while the off-diagonal represents how many times two different members have been in a commission together. The values in the column sums can be applied as tie weights in the statistical measures of different network attributes, and in visualisation, but this is slightly outside the purpose of this thesis. Using the example above, it is clear that Ådne Cappelen occupied a seat in two different commissions, both of which Alma Kajatz was also a member. By pre-multiplying the two-mode matrix by its transpose, one can also analyse the network as a commission-by-commission matrix.

Table 2: excerpt from commission-by-commission matrix

	201601	201602	201603	201604	201605	201606	201607	201608	201609
201601	22	0	0	0	0	1	0	0	0
201602	0	11	0	0	0	0	0	0	0
201603	0	0	20	0	0	0	0	0	0
201604	0	0	0	16	0	0	0	0	0
201605	0	0	0	0	3	0	0	0	0
201606	1	0	0	0	0	23	0	0	0
201607	0	0	0	0	0	0	17	0	0
201608	0	0	0	0	0	0	0	16	0
201609	0	0	0	0	0	0	0	0	7

As is evident from table 2, the diagonal represents how many members the commission has, while the off-diagonal shows whether a commission has a tie to another commission, through a common member. In this type of matrix it is important to see the off-diagonal column sums in light of the number at the diagonal. The probability of overlapping memberships might be larger simply

because the commission has many members (Borgatti et. al., 2018, p. 272). This commission-by-commission matrix, however, is simply an example of how 2-mode data can be analysed. In this thesis it makes little sense to speak of commissions as central, as one cannot assume that a commission has more influence based on shared members with other commissions. Therefore, the centrality scores in this thesis are based on the member-by-member matrices. The third possible way to work with two-mode data is to directly analyse the network as a bipartite graph (Borgatti et. al., 2018, p. 269). However, there are some problems with this approach, for example that ties cannot occur between individuals or between commissions, which in turn excludes valuable information from the analysis, at least with regard to the research questions I am posing.

3.2 Data and operationalization

3.2.1 Data

To answer my research question, I utilize data on the public commissions, and the commission members. This data was collected by researchers at the ARENA institute at the University of Oslo, more specifically researchers working at the EUREX-project, studying the role of researchers and scientific knowledge in policymaking. The data was collected from the public reports published by the commissions. These reports only contain publicly available information, which allows me to publish the results from the analysis without anonymizing commission members. The EUREX-dataset has an extensive amount of information, but was not originally intended for SNA. Therefore a great deal of data processing had to be done in order to analyse and visualize the network structure of the commissions and their members. The software I have used for both processing and analysing the data is R statistics, which is an open source statistical software program that allows for the application of a wide range of SNA-methods.

The dataset consists of a large number of variables relating to the commission reports, and the members of the commissions in the years between 1972 and 2016. The commissions are different in regard to size and objective. Some are for example explicitly asked to propose changes in legislation (law-drafting commission), while others are more oriented towards studying a policy field (policy-preparing commission). However, for the purpose of this thesis there is no need to differentiate between the commissions, seeing as influence is based on network-position rather

than traits relating to the commissions. Furthermore, when including both the members and their secretariats during the full time period, there are a total of 16898 members in the dataset. When I exclude the rows that have missing values on the name-variable, the total number of commission members is 16800. However, when processing the data to be utilized for network analysis, it is clear that only 9619 unique commission members are a part of the NOU-system. The reason for this discrepancy is that the same individuals have been counted once in the data for every time they occupied a seat in a commission. This also shows that there is good reason to analyse the NOU-system as a network, as there seems to be a considerable amount of reoccurring members in the data. The 9619 members include both members of the commissions and secretariat-members. The reason for not excluding the members of the secretariat is that some individuals might have served both in the secretariats and as a commission member at different times. Excluding the secretariat would increase the possibility for not counting the number of ties a member has correctly. In addition to this, making the assumption that secretariat-members are not influential would be a controversial claim at best, and incorrect at worst.

3.2.2 Operationalizing the variables of interest

Affiliation

As mentioned, three competing approaches to democratic policymaking guide the second part of the analysis, with regard to who the most central actors in the NOU-network are. These three approaches correspond to the relative influence of three particular affiliations, namely: academic experts, civil servants/public officials and interest group representatives. Treating the member's affiliations as indicators of certain democratic approaches to policymaking is in line with the argument of Halligan (1995), who states that the extent to which a policy advisory system is dominated by governmental or external pressures indicates the underlying democratic approaches to policymaking.

When assessing the extent of influence among the academic experts versus among interest group representatives or public officials/civil servants, it is important to clarify what types of affiliations that are prevalent in the data. Most of the members are categorized in terms of having an affiliation or profession, which is further coded into a categorical variable of 10 values/categories, and presented in the table below.

Table 3: *Affiliation categories among NOU-members*

Value	Label
1	Academics
2	Civil Servants
3	Public Officials/Employees
4	Interest Group Representatives
5	Industry and Commerce
6	Judges
7	Lawyers
8	Consultants
9	Politicians
10	Others

Source: *Eurex codebook – see appendix*

Members in the academics-category are defined as being employed at an independent research institution. This includes individuals holding a PhD, and currently employed (or retired) at universities, independent research institutes or research centres (see appendix for original codebook). Members in the civil servants-category are individuals employed in ministries, while the public officials-category includes other public employees at the local or regional administrative level, as well as other employees at public agencies or the military. These two categories (2 and 3) are grouped together in a “public officials”-category, seeing as there is not much to gain theoretically or empirically by separating them. This has also been done by Christensen and Hesstvedt (2018). The fourth category, interest group representatives, include individuals that represent organized interests such as labour unions, professional organizations or other organized citizen groups. The remaining categories do not receive much attention in the analysis, and are mostly coded as “others” when the focus is on the centrality of actors with the three affiliations of interest.

It is important to note that an individual is coded in terms of the affiliation they had at the time the commission work took place. For some professions such as politicians, civil servants or public officials, moving between these affiliations is more likely than for other groups. The risk of an actor occupying several affiliations (at different times) is especially large because of the fact that the data includes 45 years of commissions. The way I deal with this in the data is by using the mode of the affiliation-variable. That way, a member who, for example, served in a commission 4 times as a public official, and one time as a politician, will be regarded as a public official.

Influence

An important aspect of this thesis is to measure the potential influence of the actors in the NOU-network. First of all, I would like to draw attention to the distinction between influence and power, especially the more coercive forms of power. Max Weber defined power as “...the probability that one actor within a social relationship will be in a position to carry out his own will, despite resistance, regardless of the basis on which this probability rests” (1947, p. 152). It can easily be pointed out that merely having influence does not coincide with the definition above, but is perhaps more in line with what scholars have named persuasive power, which is an informal type of power with no real ability to sanction individuals that do not comply (Knoke & Kostichenko, 2017, p. 92). Influence is the ability to have an effect on someone or something, without the use of force. Thus, there is not necessarily much that separates influence and power, when using the term persuasive power.

Interpreting measurements of centrality as a proxy for influence is widely used within SNA, and especially when it comes to political networks (Grønmo & Løyning, 2003; Patty & Penn, 2017). In this thesis I am using three different centrality measures to capture somewhat different aspects of influence potential. Influence in this thesis is measured as degree centrality, eigenvector centrality or betweenness centrality, for which the mathematical foundation will be elaborated further below. For now it is enough to note that they measure different aspects of having influence.

Network structure

In the previous chapter, some theoretical arguments were provided for why it is interesting to analyse the structure of the NOU-network, and how it evolves. When I refer to network structure in this thesis, I mean the way in which centrality is distributed. Thus, when I claim that a given actor is “structurally important”, this is because the actor in question has a high centrality-score. However, network structure mostly relates to characterizing the whole network. To be able to make inferences about network structure, three different measurements are used, but there are a wide range of possible ways to characterize whole networks (Borgatti et. al., 2018, p.173). The first one I utilize is cohesion, the second one is centralization, and the third is aggregated centrality, which in different ways relate to how centrality is distributed. The mathematical foundations of these measures are elaborated in section 3.3.1. Often in SNA, visualization is an important aspect of characterizing network structure. However, networks in the social sciences rarely include as many individuals as in this thesis, and visualizing the whole 45-year network would be messy and

uninformative. Instead, the analysis includes a comparative visualization of two different 5-year networks to be able to observe how the network structure has changed.

Time

As mentioned, both of my research questions relate to changes over time. I operationalize time in 5-year time-periods, but to check the robustness of the results from the 5-year networks, 9-year networks are also analysed. In most other research designs, exactly how time is divided might not be that much of an issue. In SNA, however, it is a little different. The number of connections a given actor has, depends on how the boundaries of the network is set, so therefore it might be problematic to more or less arbitrarily divide the network (Gross & Jansa, 2017). For this exact reason, two different measurements of time are utilized, in order to check if the results of the 5-year networks correspond to the 9-year networks. This means that the analysis will be based on the division of time shown below.

Table 4: Measuring time

Time-period	1	2	3	4	5	6	7	8	9
5-year networks	1972 - 76	1977 - 81	1982 - 86	1987 - 91	1992 - 96	1997 - 01	2002 - 06	2007 - 11	2012-16
9-year networks	1972 - 80	1981 - 89	1990 - 99	1999 - 07	2008 - 16				

3.3 The methodology of social networks

As mentioned earlier, analysing social networks in a systematic way has been done in social sciences since the 1930s (Borgatti et. al, 2009. P.892). However, social network research has since advanced along several lines, including the use of matrix algebra and graph theory as the mathematical foundation for detecting social concepts such as group-formation and social relations (Borgatti et. al., 2009, p. 892). More recently, Borgatti and Foster (2003, p.992) found that the use of SNA has in fact increased exponentially from the 1970s until early 2000s, and there is nothing that suggests a decline in recent years.

A core assumption that is made when using SNA to study social phenomena is that the structure of relations between individuals affects outcomes (Robins, 2015, p. 4). Thus, one of the reasons for doing research on social networks is the belief that the positions of individuals in a network determine their opportunities and constraints (Borgatti et. al., 2018, p.1). As earlier mentioned, the research design of this thesis is not a causal one, so I will not actually use networks as an independent variable predicting an outcome variable. However, the possible implications of network characteristics will be discussed in light of theory.

3.3.1 Central concepts of network analysis

Nodes and ties: the building blocks of networks

When using SNA to study social systems, the focus is generally on the actors - which are commonly referred to as *nodes*⁵ - and the relationships between them, called *ties*⁶. At the most basic level, analysing social networks is essentially mapping the nodes and ties in the network. In the case of the NOU-network, the ties are what we call undirected, meaning that there is not just a one-way relationship between two nodes (Robins, 2015, p. 7). Substantially, this means that cooperation or some kind of mutual relationship takes place, which of course is expected when studying public advisory commissions. Furthermore, ties in network analysis can be persistent or fleeting. Some ties are inherently permanent – such as familial ties – while others are brief interactions. Borgatti Everett and Johnson (2018, p. 35) label the ties between members of groups as co-occurrences. Some co-occurrences are fleeting while others are relatively persistent. In my case, where commissions usually carry out their work in the length of one to two years, it might be a stretch to claim that ties are persistent when the whole length of the data is 45 years. However, because analysis is often divided into time-periods, only the ties that occur within the same time (either within 5 years or 9 years) are counted.

Borgatti et. al. (2018, p.3) uphold that when working with network data, one can distinguish between three levels of analysis: the node level, the dyadic level and the group/network level. At the node level, questions about actor characteristics or outcomes are typical. However, an actor does not have to be a person. A node can refer almost anything, ranging from firms, and cities, to countries or different types of groups (Borgatti et. al., 2018, p. 2). When analysing social networks,

⁵ In graph theory actors/nodes are also referred to as *vertices*.

⁶ Also referred to as *links* or *edges*.

deciding on what entities are the nodes and edges in a network is a fundamental choice, because it has consequences for later measurements of for example node centrality (Patty & Penn, 2017, p. 148). In this thesis, the nodes of the network are the commission members. The dyadic level refers to the characteristics of the relationship between pairs of nodes, such as degree of connectivity, while the group/network level refers to the traits that the network as a whole or groups within the network are characterized by, such as cohesion or centralization (Borgatti et. al., 2018, p. 3). The focus of this thesis is on the node level and network level. Thus, little attention is given to the dyadic level of analysis in the following pages.

Centrality

At the node level, one can analyse many different characteristics, and after converting a two-mode matrix into a one-mode matrix, measuring node-level traits such as centrality, is fairly straightforward. As mentioned, centrality refers to somewhat different things, and can thus be measured in several different ways. *Degree centrality* is the simplest way to measure which of the actors/nodes in a network that are influential (Hu, 2018, p. 2). The nodal degree is measured by how many ties a node has to other nodes. This can be expressed mathematically in the following way:

$$C_D(n_i) = \sum_j x_{ij},$$

where $CD(n_i)$ denotes the degree centrality of node i in the network, and x_{ij} represents whether there is a relation between node i and j for all nodes in the network. The underlying idea of degree centrality is that an actor with many ties to other actors must be a prominent one with a lot of influence (Patty & Penn, 2017, p.149). Eigenvector centrality is somewhat similar to degree centrality, but goes one step further. Instead of simply counting the ties that each node has to another node, eigenvector centrality also takes into account the centrality of adjacent nodes. In other words: a node is more central if the nodes connected to it are central as well. This measure is expressed by:

$$e_i = \lambda \sum_j x_{ij} e_j$$

where e represents the eigenvector centrality and score. The symbol λ (lambda) is the proportionality constant that in this case is referred to as the eigenvalue. A centrality score for a given node is thus proportional to the sum of the centrality scores to the adjacent nodes (Borgatti

et. al., 2018, p.194). Eigenvector centrality is an inherently normalized measure, and when the equation is performed for a given node, the calculated centrality for that node will always be a number between 0 and 1. The most central actor in the network will always get a centrality score of 1, and the least central actor will always get zero.

A third important feature of nodes is their *betweenness centrality*. This refers to how often a node represents the shortest path between two other nodes (Borgatti et. al., 2018, p.201). In simpler terms, how many actors does a specific actor connect? This is calculated for each pair of nodes (other than the node in question) by the proportion of all the shortest paths that go through the node in question. The betweenness centrality measure is based on geodesic statistics, which are mostly applicable to undirected networks, such as the NOU-network in this thesis. The term; geodesic, refers to the shortest possible path between two vertices. The formula for calculating the betweenness centrality of node i , is given by

$$b_i = \sum_{j < k} \frac{g_{jik}}{g_{jk}},$$

where g_{jik} refers to the total number of geodesics in the network connecting node j and k through node i , while g_{jk} is the total number of geodesics connecting j and k (Borgatti et. al., 2018, p. 201). For the network data in this paper, betweenness is important when assessing which of the nodes that are important for connecting other nodes. The interpretation of this measure is not as straightforward as degree centrality or eigenvector centrality, but it still might be an important way of capturing latent influence in a qualitatively different way than the two other measures. It is based on the classic work by Granovetter (1973) in “The strength of weak ties”, where he elaborates on the foundations for why we could expect a tie between person A and C if A and B, and B and C are connected.

Cohesion, centralization and aggregated centrality

At the network level of analysis, network cohesion and centralization are important terms that characterize the structure of the network more generally. If a network is cohesive, there is a high level of connectedness between the nodes. This is typically measured as the proportion of pairs of nodes in the network that has ties to each other, also referred to as density (Hu, 2018, p.2). In my case, I do not expect the network as a whole to be characterized by a high level of density. On the contrary, this network has a very large number of members, and the difference in the number of possible ties compared to the number of actual ties is extremely high. Still, measuring density and

comparing the extent of cohesion across different years in the dataset, allows us to see how the network structure changes over time. This can tell us something about the connectedness of policy-advisers in the NOU-system. The density is calculated by using the following formula;

$$D = \frac{2E}{N(N - 1)},$$

where N denotes the size of the network and E denotes the number of edges. We divide the number of edges by the maximum number of possible edges in the network to get a density measure that is comparable across groups (Hu, 2018, p. 2).

Centralization is a measure of the extent to which a network is dominated by a single node. The operationalization of centralization is thus; the difference in sum between each nodes' centrality and the centrality of the most central node (Borgatti et. al., 2018, p.184). The measure of degree centralization is utilized and presented in the analysis as a centralization index. To clarify the mathematical foundation for this index we can consider an example. If a network has 5 nodes, then the maximum possible number of connections for each node is 4. Let us say that the most central node is connected to all four nodes, while three of others are connected one and one node is connected to three. Then the sum of differences would be $(4-1) + (4-1) + (4-1) + (4-3) + (4-4) = 10$. This number is then divided by the maximum centralization which occurs when one actor has ties to all others, but they are not tied to each other. In our example with 5 nodes, this would be given by $(4-1) + (4-1) + (4-1) + (4-1) + (4-4) = 12$. That means that the centralization score for this network would be: $10/12 = 0,833$. Note that a score closer to 1 equals less centralization, and a number closer to 0 equals more centralization.

However, comparing centrality scores between the most central node and all others, while useful for some research questions, does not capture how centrality is distributed the full extent. That is, I am interested more than the potential influence of one single node. Therefore, I will also be studying how the *aggregated centrality* changes over time. This will tell us more about how centrality is distributed among larger groups in the network as well. The calculation of aggregated centrality is simply the centrality score of all the nodes, divided by the number of nodes for either the whole network or groups within the network. The analysis involves comparing the mean of the centrality equations above for the whole network, or groups within the network.

3.3.2 Methodological limitations

Missing data

When it comes to identifying the nodes and the ties between them, network data is particularly sensitive to missing data. This is because one missing node might have a large number of ties to other nodes, and thus reducing the degree centrality of a potentially large number of nodes in the network. Compared to the size of the dataset, however, the number of missing data on commission member name is exceptionally low. Those who are missing are usually members of commissions during the early years of the data collection time period. Often, these individuals are secretaries, and the information from the report would typically state something along the lines of “The secretary was appointed by the ministry of finance”, or “The commission had one secretary”, without naming the individual in question. The missing observations on commission member name are simply excluded from the data by row. It is not possible to say if these individuals occupied seats in commissions at other times during the period, and therefore we cannot know whether they would have been central actors in the network (or, in fact, *are* central actors at later points in time). It is possible to correct for missing observations using imputation strategies, but certain studies have showed that when there is a very low proportion of missing observations, imputation is not especially helpful (Gross & Jansa 2017, p.191). Therefore, simple node deletion seemed like the best option in this case. However, the percentage of the total number of members missing from the data is extremely low, by any statistical standard, reaching only 0,6 %.

There is, however, a much larger proportion of missing observations in the variables relating to affiliation or other variables of interest. This does not affect node-level measurements such as centrality, nor does it affect the network-level measurements of density or cohesion. Still, visualizations of the network by affiliation is somewhat affected by this lack of information, as they then are grouped into the “others”-category.

SNA-specific problems

Some of the typical network-data measurement errors are avoided in this thesis, mainly because the data is not gathered by respondent questionnaires. Still, other common problems are unfortunately present. Building on the section on missing data outlined above, one of the first things I noticed when processing the data was the sensitivity that R (and other statistical software for that matter) has to the misspelling or variation in the writing of names. For example, if an individual is coded as “Ole Ivar Mortensen” in one commission, and “Ole I. Mortensen” in

another, they will be counted as two different individuals although they are clearly the same person. The same logic applies to misspelled names. These types of measurement errors are commonly referred to as *falsely disaggregated nodes*, and leads to the same problem as noted above in regard to missing data; one underestimates the degree distribution of nodes (Gross & Jansa, 2017, p. 187). Since there was no other way of identifying the same individual (there is an ID-variable, but that is unique to the specific person in each commission, i.e. person-commission observations), this had to be cleaned up before proceeding to the analysis. Using a function in R that extracts almost-similar character vectors from a character string, I was able to identify the variations in the names of the commission members referring to the same person, and manually correct these. Still, the dataset is, as mentioned, exceptionally large for SNA, and therefore it cannot be guaranteed that all of the misspelled names and variations in writing have been corrected.

Another potential weakness of the data lies in the fact that it was not gathered only for the purpose of SNA. The amount of information available on the characteristics of the relationships between the members is not as rich as it would be in data collected for the purpose of network studies. For example, we can only identify the formal ties members have to each other by virtue of being in the same commission, but we do not know anything about the informal relationships that many of these individuals might have to each other – even if they have not been in the same commission. However, gathering more information on the social relationships in the network would be a far too comprehensive task for the size and purpose of this thesis. Therefore, throughout this thesis, descriptions of the network applies to the “observed network” (the one that exists in the data which unavoidably has errors), rather than the “true network”, even if the goal is to get as close to this as possible (Gross & Jansa, 2017, p. 186).

4. Analysis

The analysis is divided into two main sections. In the first section I outline the network structure of the NOU-network as a whole, using the measures of centralization and cohesion (density), and aggregated centrality. As mentioned earlier, if a social network is centralized, fewer people have more potential influence. If a network is cohesive, this indicates that the network is more densely connected. In the second section of the analysis, I will analyse the commission members to answer the question of whether experts to a larger extent occupy central positions in the NOU-network. In the centrality analysis in the second section I will first address the question of whether a structural elite can be identified within the network. Subsequently, a broader analysis will highlight the structural network-position of the most important commission members, allowing me to analyse the changing structural importance of members with different affiliations over time. The measure of degree centrality, as well as the measures of betweenness and eigenvector centrality will be used to highlight different aspects of being structurally important in the NOU-network.

4.1 The NOU-network: Characteristics over time

Before moving on to analysing network and group-level characteristics, it is necessary to clarify a specific characteristic with regard to the structure of the NOU-network: this network is inherently characterized by a group-structure, as the ties are operationalized as shared membership in a commission. The commission could of course constitute a group. However, when using the term group-level analysis in this section, groups refer to the different affiliation-groups, i.e.: actors who are defined as for example public officials.

In this section, the first research question at hand is the one that will receive attention, namely: *What characterizes the network structure among members of Norwegian advisory commissions, and in what way has it changed over time?* I address this question by analysing trends of centralization and cohesion at the network-level, and aggregated centrality both at the network-level and group-level.

4.1.1 Centralization and aggregated centrality

Centralization

Centralization is one way of characterizing how centrality is distributed in a network. If a network is highly centralized, one actor is very well connected, while many actors are not very well connected at all. If a network is *decentralized*, the difference between the most central actor and all others is smaller. In other words; centrality would be more evenly distributed among many of the actors in the network. First, I present some descriptive statistics. Table 5 shows a tendency for there to be fewer commissions over time, and subsequently fewer commission members, as also found by Christensen & Holst (2017, p.825). However, there seems to be a growing number of members on average in each commission, as this increases from around 9 members per commission in the first time-period to about 12 in the last time-period.

Table 5: Descriptive statistics on commissions and members

Time-period	N Members	N commissions	commission size (sec. included)			Avg. no. of commissions per member	Degree centrality		
			min	max	Avg.		min	max	Avg.
1 (72-76)	1778	288	1	25	9,2	1,45	0	306	26,56
2 (77-81)	1909	269	1	24	9,2	1,29	0	142	24,95
3 (82-86)	1505	199	1	20	9,5	1,26	0	174	25,02
4 (87-91)	1347	163	1	25	9,9	1,22	0	238	26,17
5 (92-96)	1205	150	2	27	10,3	1,30	2	200	31,1
6 (97-01)	1564	149	1	30	12,4	1,29	0	276	38,76
7 (02-06)	1231	123	3	28	12,0	1,39	8	378	40,91
8 (07-11)	1119	95	3	24	13,2	1,32	6	468	43,94
9 (12-16)	1110	92	1	25	12,3	1,31	4	528	44,14
Total	9619*	1529							

* Total number of commission members do not correspond to the sum of different time-periods, as some members are counted in several time-periods. Sec. = Secretaries

The average commission size increases with about 3 members per commission, while the average degree centrality increases by 18 ties. In other words: there seems to be fewer commissions over time, but it also that the individuals who occupy seats in several commissions to a larger extent find

themselves in large-N-commissions, increasing their number of ties (as the average number of commissions per member is substantially unchanged over time). This suggests a tendency of the commissions to be larger, but also that overlapping commission-memberships increase, which gives us an indication that the aggregated centrality has increased.

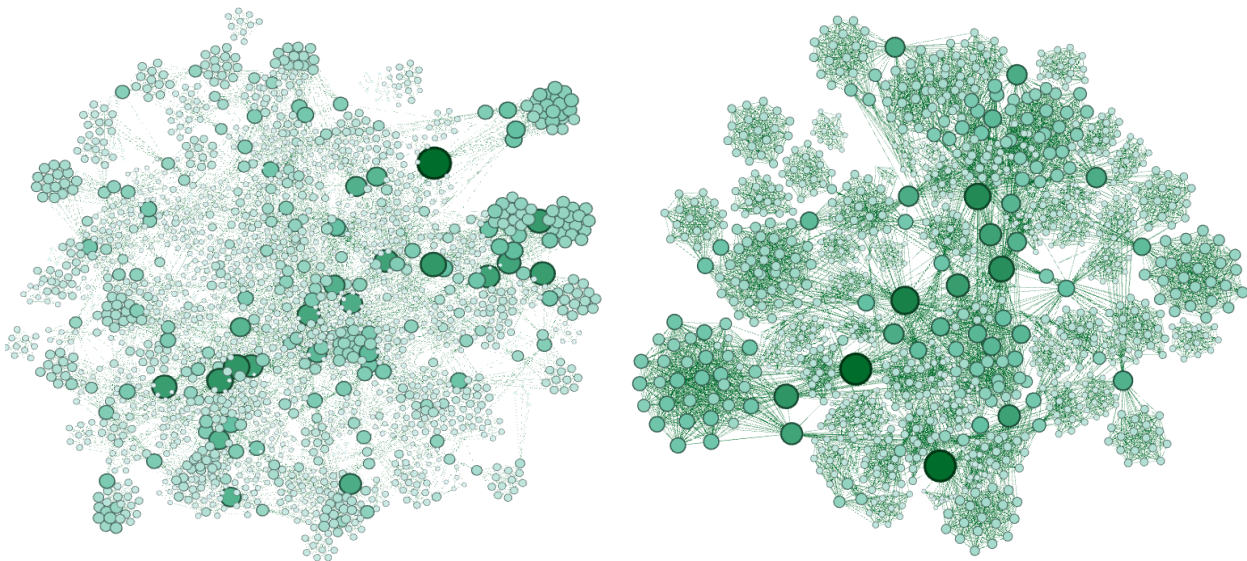
In table 5 we also find that the maximum degree centrality (number of ties) from the late 70s to mid-80s does not exceed 200 ties, while the maximum degree centrality in the most recent time-period is more than 500 ties. Of course, these numbers could be the results of outliers in the data. That is, we do not yet know if the maximum degree centrality is representative of a larger group of actors being more central, or if this value only represents one person, while all others have low degree-centrality scores. The centralization-index does, however tell us something about this tendency. Remember from the previous chapter that a value close to 0 indicates a centralized network, while a value close to 1 indicates a decentralized network. Table 6 shows a tendency for the network to become less centralized over time. Substantially, this means that in early years in the data, the difference between the most central actor and all others was larger than it is in later years.

Table 6: Centralization over time

Time-period	1 (72-76)	2 (77-81)	3 (82-86)	4 (87-91)	5 (92-96)	6 (97-01)	7 (02-06)	8 (07-11)	9 (12-16)
Centralization-index	0.078	0.031	0.049	0.079	0.070	0.076	0.137	0.189	0.218

If we compare table 6 to the average degree centrality scores in table 5, it is evident that the increase in number of ties must be relevant for a larger group of actors than just one (or else we would have observed increased centralization). To further illustrate the tendency for the network to become less centralized over time, the network from the first and last time-period is visualized below. The node size, and node colour is determined by degree centrality, and the same scale is used for both networks. It is clear from this figure that in the early 70s-network there are many nodes that are not central to the network at all, while in the most recent network, many nodes have higher centrality-scores. Thus, we see that centrality is more evenly distributed among the commission members in recent time-periods than it was in the 70s.

Figure 2: Network one, 1972-76 (left) vs. network nine, 2012-16 (right)



* One-mode projection. Node size and colour vary according to degree centrality.

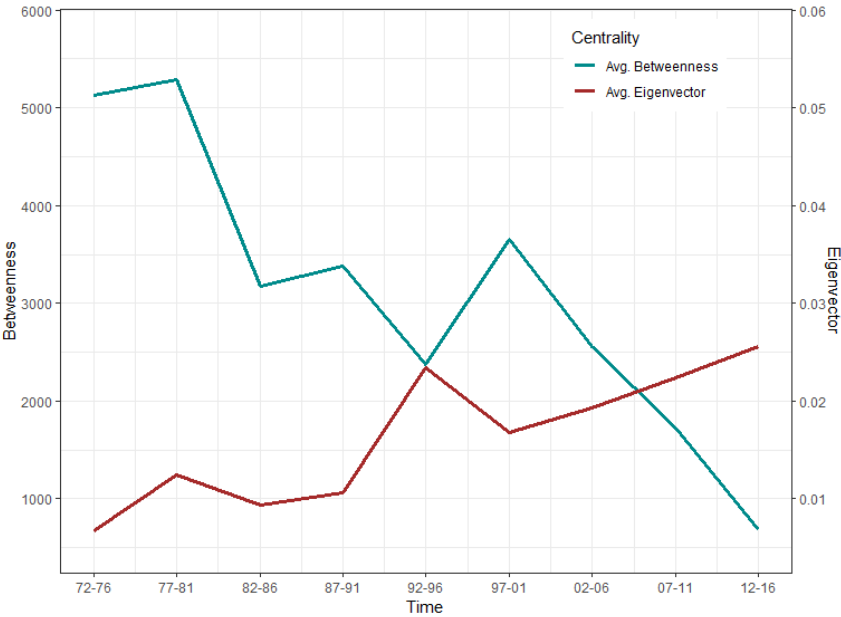
It is clear from table 6, and figure 2 that in terms of degree centrality, the network has indeed become less centralized over time. In other words, several actors are more central, and the sum of differences between the most central nodes and all others has become smaller.

Aggregated centrality

From table 5 we know that the aggregated degree centrality increases over time. It is then, perhaps, surprising that the tendency for betweenness centrality is completely different. Figure 3 shows the average betweenness centrality and eigenvector centrality for all members. I will begin by describing the trends for the aggregated betweenness centrality (left y-axis), which, evidently, is decreasing quite sharply. As earlier mentioned, betweenness centrality measures how often a node falls between two other nodes as the shortest path between two otherwise unconnected nodes (Borgatti et al., 2018, p.201). When this value is zero for a given node, it means that this node is never the shortest path between any other nodes. The betweenness value is computed as the number of paths connecting two nodes through a certain node, divided by how many other paths that connects these two nodes. The interpretation of betweenness centrality is, as mentioned, less intuitive than for degree and eigenvector centrality. One could say that betweenness centrality measures a more latent way of potentially having influence because of the structural position a node has as a connecting node between other pairs of nodes. A high betweenness value is thus interpreted as

giving a node importance, because it then occupies a gatekeeper-position between clusters of other nodes. This could mean that certain members, even if they are not necessarily connected to a very large number of other members, they connect members that would not otherwise be connected. In the context of the NOU-network, they may connect commissions appointed by different ministries, or different sub-fields or communities within the network.

Figure 3: Average betweenness and eigenvector centrality scores for the whole network

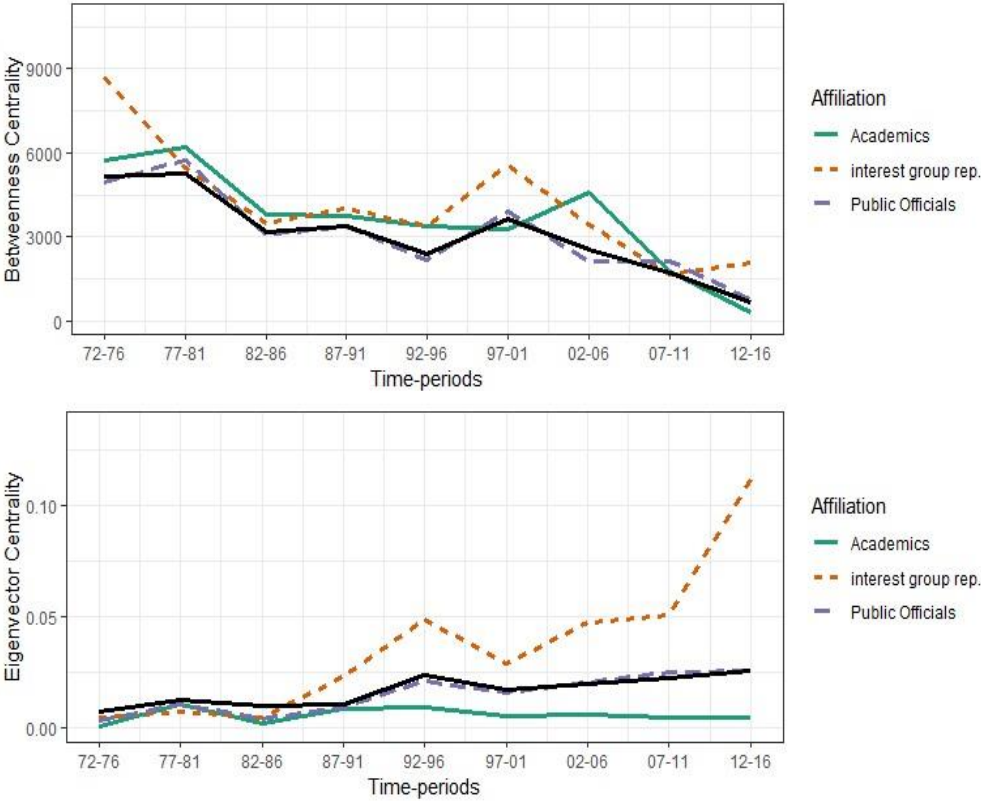


Aggregating the betweenness centrality measure to the network-level, as is shown in figure 3, tells us something about the sum of how many nodes occupy such a position in the network. It is then perhaps not so surprising that when more commission members have a higher degree centrality value, less members occupy such important gatekeeper-positions, simply because more members are already connected to each other. Eigenvector centrality is also aggregated to the network-level in figure 3 (right y-axis). This measure seems to correspond to degree centrality in terms of centralization, displaying higher values over time, which is not surprising seeing as both measures are based on tie count.

Turning to the group-level, figure 4 shows the aggregated betweenness and eigenvector centrality scores for the three affiliations of interest, operationalized as indicators for which approaches to policymaking that are highlighted in the NOU-system. This underscores the group differences

from the total centrality mean in the data, although it is evident that certain affiliations largely follow the total mean represented by the black line.

Figure 4: Average betweenness (top) and eigenvector (bottom) centrality for all members



* Grouped by affiliation. Black line represents the total average

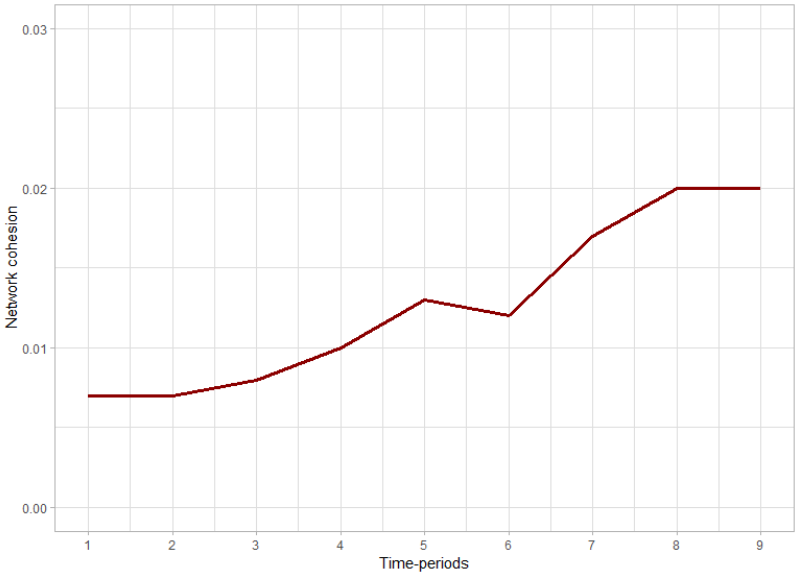
When looking at figure 4, some interesting trends are evident. For example, academic experts seem to have experienced a slight upswing in betweenness centrality during the early 2000s, and generally have centrality-scores above average. The interest group representatives in the NOU-network had the highest betweenness centrality in the early 70s, and has remained above the total average for the whole time-period. The public officials seem to follow the total average in a steadily decreasing tendency from the beginning of the 70s, to 2016. Yet, when it comes to eigenvector centrality, the image is a little different. First of all, while the different affiliations were at approximately the same level of centrality until the early 90s, they diverge more from one another towards the end the 90s and in the 2000s. Eigenvector centrality is, as mentioned, a measure of structural importance not only taking into account the number of connections a given node has, but also the centrality of the adjacent nodes (Borgatti et al., 2018, p. 194). In other words: it measures whether a commission

member is connected to other well-connected commission members. The eigenvector centrality value varies between 0 and 1, and is perhaps not surprisingly quite low in general, seeing as this value is inherently standardized according to network-size. Looking at the average eigenvector centrality for the whole network (the black line), it is evident that the total eigenvector centrality in the network is steadily increasing, which can be interpreted as the commission members in the NOU-network becoming more well-connected in general. An interesting finding at the group level is that interest group representatives are by far the most well-connected affiliation from the mid-90s until 2016. Public officials and academics seem to follow the total average more closely, but academics do in general not seem to surpass the average at any point in time.

4.1.2 Cohesion

Cohesion refers to how well-connected a social network is. Network cohesion is, as mentioned, often measured by density, which is simply the number of ties in the network, expressed as the proportion of the number of possible ones (Borgatti et al., 2018, p. 173). If a network is cohesive, one would for example expect more conforming behaviour from the nodes in the network, but if it is not densely connected, the nodes are expected to behave more independently from one-another. The advantage of calculating density rather than for example the average number of ties, is that it adjusts for the total number of possible ties, so that comparisons of different networks over time is more reliable.

Figure 5: Network cohesion over time



As evident from figure 5, while the NOU-network is becoming more cohesive over time, the network is still somewhat poorly connected. This has to do with the type of network we are dealing with. Densely connected networks are often found in friend-groups, school-classes or other networks characterized by informal ties. This network is, as mentioned, constituted by formal ties between members who occupy seats in the same commission. In addition, the network-size exceeds 1000 nodes in all time-periods. It is therefore not surprising that the network is not very cohesive. Nonetheless, it should not be ignored that the density of the network virtually doubles over time, even if we are dealing with small numbers. The fact that the cohesiveness of the network is increasing might be connected to the centralization tendency, in which high centrality-scores are distributed among fewer commission members. The tendency for the network to be more densely connected is also evident in figure 2, from the previous section. In addition to the higher centrality scores on average (represented by larger circles), there are also an increasing number of ties between the commission members outside of their own commission, and fewer “isolate-commissions”, which makes the network more connected in general.

To sum up the findings with regard to the first research question, the NOU-network is both becoming less centralized and more cohesive over time. While the aggregated degree centrality and eigenvector centrality is increasing, the aggregated betweenness centrality is decreasing. These tendencies make sense in relation to each other. First, because the aggregated degree and eigenvector centrality increases, it is natural that centralization decreases because the sum of differences between the most central nodes and all others is smaller. Second, the tendency for the betweenness centrality to decrease is compatible with the other two centrality measures increasing. This is because when more actors are directly connected to each other, there are less actors that occupy such “connecting” positions in the network that is measured by betweenness centrality. Furthermore the network is becoming more cohesive over time. One should, however, be careful attaching too much meaning to this, as an increase from 0.01 to 0.02 is modest at best. The possible implications of these findings will be discussed further in the next chapter.

4.2 Centrality analysis

In this section, I focus more directly on the most central individuals of the NOU-network. In other words we are moving on to the node-level of analysis. Thus, in this section, my aim is to answer the second research question of the thesis, namely: *To what extent have experts, compared to actors with other affiliations, gained greater influence over time, in terms of structural position in the network?* I try to do so by first exploring whether a “power-elite” can be identified within the network, and looking at the affiliations of the actors that seem to occupy the most important positions in the network. In the previous section, trends for the affiliations were included with aggregated centrality scores for groups, but there are a substantial amount of members with low centrality scores. Therefore, to be able to identify a structural elite and their affiliation, it is necessary to limit the analysis only to the most central commission members in the network. Subsequently, an analysis of the 100 most central actors will be carried out, to be able to identify larger trends over time and with regard to the different theoretical accounts of influence of actors from the different affiliations.

4.2.1 The “power-elite” in the NOU-system between 1972 and 2016

There are several approaches that can be taken when trying to identify who the actors with the highest potential for exercising influence are. In this section, I will try to identify the most important individuals in the NOU-network, and answer the question of whether or not there is a power-elite, and whether this remains stable, or changes over time. All of the aforementioned centrality measures will be used, allowing me to determine to which extent they overlap among the most important NOU-members. First, I will examine the 10 most connected, and therefore potentially the most influential commission members of the whole 45-year network. This is not only done as a means for possibly identifying a structural elite in the network, but also to make the subsequent analysis more tangible in terms of having specific examples of influential nodes in the network. Secondly, I will look closer at the most important individuals in the 5-year time-periods that were also utilized above, to be able to make claims with regard to the time-perspective, and how centrality among the potential power-elite in the NOU-network develops over time. Lastly, as a robustness-check, I will analyse the 10 most important commission members over 9-year time-periods. The trends with regard to aggregated centrality and cohesion observed in the previous sections is might be indicative of an emerging structural elite in the NOU-system. In any case, analysing whether the same individuals more or less dominate the network over time, and looking

at their affiliation, will give some insight as to which theoretical perspective will prove the most useful. Note that in this section, the focus will mostly be on degree and eigenvector centrality, as these measures capture the possibility to directly influence other actors in the most straightforward and intuitive way.

Table 7: Top 10 most central members in the whole 45-year network

	Name/Affiliation	Degree	Name/Affiliation	Betweenness	Name/Affiliation	EV*
1.	Erling Selvig (Academics)	805	Stein Reegård (Interest group rep)	1506049.3 (708)	Øystein Løining (Public official)	1.000 (750)
2.	Øystein Løining (Public official)	750	Olav Magnussen (Interest group rep)	1106517.5 (611)	Erling Selvig (Academics)	0.997 (805)
3.	Stein Reegård (Interest group rep)	708	Erling Selvig (Academics)	840110.0 (805)	Rolf A. Skomsvold (Interest group rep)	0.995 (687)
4.	Eystein Gjelsvik (Interest group rep)	699	Olav Gjærevoll (Academics)	795111.2 (140)	Eystein Gjelsvik (Interest group rep)	0.975 (699)
5.	Rolf A. Skomsvold (Interest group rep)	687	Juul Bjerke (Interest group rep)	747748.1 (214)	Erling G. Rikheim (Public official)	0.974 (662)
6.	Per Melsom (Public official)	678	Inge Lorange Backer (Academics)	740146.2 (131)	Per Melsom (Public official)	0.957 (678)
7.	Erling G. Rikheim (Public official)	662	Karin M. Bruzelius (Public official)	720233.3 (123)	Ottar Dalsøren (Interest group rep)	0.949 (628)
8.	Arnhild D. Gjønnnes (Interest group rep)	629	Magnus Aarbakke (Academics)	627535.2 (140)	Kari Lærum (Public official)	0.913 (602)
9.	Ottar Dalsøren (Interest group rep)	628	Nils Holm (Public official)	617574.7 (111)	Olav Breck (Interest group rep)	0.855 (537)
10.	Olav Magnussen (Interest group rep)	611	Hege Torp (Academics)	579909.9 (142)	Arnhild D. Gjønnnes (Interest group rep)	0.837 (629)

* EV = Eigenvector. Members' affiliation = mode. Degree in parentheses for the other centrality measures

In table 7, the most central commission members in the entire network are shown alongside their affiliation. These are, by our theoretical definition of centrality, the individuals in the NOU-network with the largest potential to exercise influence. Strikingly, all members in this table fall into one of the three affiliations that are of interest to this thesis. As mentioned in the chapter covering methodology, the mode of all the affiliations a member has had is used because the most central members have often participated in multiple commissions over time and they might change affiliation from one commission to another. For example, Olav Gjærevoll (4th most central actor according to betweenness centrality), who is an academic, has one time participated in a commission as a public official, but seeing as he has mostly participated as an academic expert, this is what he is regarded as in total. Also, there is some overlap with regard to the different centrality measures. This occurs mostly between degree centrality and eigenvector centrality, and has to do with the similarity in how structural importance is measured.

Moving further into the results in table 7, there are several things worth noting. Starting with degree centrality, in which the value represents a tie count, Erling Selvig is the most influential commission

member, being tied to 805 other commission members in total. Other than this, the top 10 highest degree centrality scores consists of 6 interest group representatives and 3 public officials. Selvig is also very central with regard to both of the other centrality measures, which illustrates a case where different centrality measures overlap. Furthermore, Selvig is the only academic expert in the top 10 with regard to both degree and eigenvector centrality, which brings us to the next interesting finding in table 7. Academic experts make up half of the 10 most central commission members when examining the betweenness centrality scores. However, the interest group representative Stein Reegård is the most central commission member with regard to this centrality measure, by quite a lot. This indicates that Reegård occupies an important position in the network, potentially connecting different groups that would otherwise not be connected. In total, when looking at betweenness centrality, three interest group representatives and two public official in addition to the five academics occupy the most important positions in the network. Moving on to eigenvector centrality, table 7 shows that the member the highest potential to influence, is the public official Øystein Løining. As mentioned, eigenvector centrality is perhaps the best measure for operationalizing potential influence, as it does not only take into account how connected the member in question is, but also how connected the adjacent members are. In practice this means that Øystein Løining does not only know a lot of commission members, but the other members he is connected to are in large part important themselves as well. In total, interest group representatives make up a fairly large share of the top 10 with regard to eigenvector centrality as well, having four members with this affiliation. Still, this table does not provide a temporal perspective that would allow us to make claims about how centrality among this potential elite evolves over time, and whether the potentially influential commission members are influential for 5 or 20 years.

Table 8 below does exactly this, but has its downsides as well. Because we slice the data into different time-periods this might give some members a smaller tie-count than they would have if time was divided differently. Still, as mentioned in the beginning of this section, I will analyse trends over time utilizing two different ways of splitting into time-periods. Furthermore, in the table below I only focus on the Eigenvector and degree centrality, seeing as these measures capture the ability to influence many actors to a larger extent than betweenness centrality.

Table 8: Top 5 most central members in 9 time-periods:

Name	Degree	EV	Affiliation	Name	Degree	EV	Affiliation
1972-76 (1)				1992 – 96 (5)			
1 Torstein Slungaard	306	0.988	Politician	Arnhild D. Gjønnnes	200	0.997	Interest group rep.
2 Sverre Krogh	286	1.000	Politician	Svein Longva	198	0.011	Public official
3 Arne Nilsen	262	0.985	Politician	Erling Selvig	192	1.000	Academic
4 Bergfrid Fjose	260	0.999	Politician	Olav Magnussen	190	0.010	Interest group rep.
5 Erling Haugen	260	0.985	Consultant	Thorvald Moe	184	0.026	Public official
1977-81 (2)				1997-01 (6)			
1 Sverre Krogh	142	0.164	Politician	Erling Selvig	276	1.000	Academic
2 Olav Gjærevoll	126	1.000	Academic	Arnhild D. Gjønnnes	250	0.975	Interest group rep.
3 Bergfrid Fjose	124	0.148	Politician	Bjørn Tore Stølen	230	0.006	Interest group rep.
4 Hans Bjaaland	122	0.041	Interest group rep.	Øystein Løining	224	0.989	Public official
5 Arne Born	110	0.011	Interest group rep.	Olav Magnussen	224	0.008	Interest group rep.
1982-86 (3)				2002 – 06 (7)			
1 Hans Haga	174	0.042	Interest group rep.	Stein Reegård	378	0.015	Interest group rep.
2 Kirsten Myklevoll	166	1.000	Politician	Erling Selvig	352	0.989	Academic
3 Øistein Gulbrandsen	148	0.013	Interest group rep.	Bjørn Tore Stølen	348	0.007	Interest group rep.
4 Olaug Granli	142	0.979	Politician	Lars Haartveit	348	0.007	Interest group rep.
5 Odd Aukrust	130	0.041	Public official	Ragnhild Nersten	346	0.007	Public official
1987-91 (4)				2007-11 (8)			
1 Juul Bjerke	238	1.000	Interest group rep.	Liv S. Taraldsrud	468	1.000	Consultant
2 Olav Magnussen	166	0.911	Interest group rep.	Eystein Gjelsvik	452	0.999	Interest group rep.
3 Ingolv Hæreid	128	0.212	Public official	Kjersti Elvestad	446	0.999	Public official
4 Peder Berg	122	0.152	Public official	Arnhild D. Gjønnnes	440	0.999	Interest group rep.
5 Bernhard Nestaas	110	0.849	Public official	Erling Selvig	420	0.999	Academic
2012 – 16 (9)							
1 Erik Orskaug	528	1.000	Interest group rep.				
2 Tove Storødvann	410	0.923	Interest group rep.				
3 Torill Lødemel	322	0.297	Interest group rep.				
4 Stein Reegård	300	0.297	Interest group rep.				
5 Jacob Hanssen	292	0.756	Public official				

The first striking characteristic of table 8 is the amount of central politicians in the 70s, an affiliation that is virtually gone after 1986. All four of the politicians central to the first time-period have been Members of Parliament, and by being central to the NOU-network as well, they were additionally able to exercise influence through a different channel. Secondly, the amount of interest group representatives in table 7 does not seem to have been a result of the early years in the data. There are at least two interest group representatives among the top five most central members in all time-periods after 1976, which cannot be said for the other affiliations of interest. Moreover, between 2012 and 2016, four of the five most central commission members were interest group representatives. When it comes to the question of whether the most central members are central for a short or a long time-span, this table shows somewhat mixed results. For example, the academic Erling Selvig is among the top 5 most central members for a duration of 20 years, between 1992 and 2011. He seems to be the exception, however, seeing as no other commission member remains this central for more than 10 years. To be sure, it should be noted that some members are

at least among the top 20 for longer than 10 years, and can thus be found just a little further down on the list. In any case, the amount of members remaining among the top 5 most influential commission members for 10 years is not negligible, and thus we might be able to talk about an especially influential elite within the NOU-system. To further explore the possibility of there being an influential elite in the NOU-network, table 9 below shows the top 10 most influential in 9-year time-periods.

Table 9: Top 10 most central members in 5 time-periods

	<i>Name</i>	<i>Degree</i>	<i>EV</i>	<i>Name</i>	<i>Degree</i>	<i>EV</i>	<i>Name</i>	<i>Degree</i>	<i>EV</i>
	1972 - 80			1990 - 99			2008- 16		
1	Sverre Krogh (Politician)	203	1.000	Olav Magnussen (Interest group rep)	194	0.028	Erik Orskaug (Interest group rep)	387	0.678
2	Torstein Slungaard (Politician)	197	0.989	Erling Selvig (Academic)	146	1.000	Tove Storrodvann (Interest group rep)	312	0.652
3	Bergfrid Fjose (Politician)	183	0.999	Svein Longva (Public official)	146	0.027	Bente Overli (Public official)	284	1.000
4	Erling Haugen (Consultant)	176	0.915	Arnhild D. Gjønnnes (Interest group rep)	139	0.980	Erling G. Rikheim (Public official)	284	1.000
5	Thorleif Nilsen (Public official)	171	0.987	Øystein Løining (Public official)	137	0.988	Erling Selvig (Academic)	284	1.000
6	Arne Born (Interest group rep)	164	0.986	Bernhard Nestås (Public official)	112	0.025	Eystein Gjelsvik (Interest group rep)	284	1.000
7	Dagfin Juel (Public official)	164	0.986	Stein Reegård (Interest group rep)	106	0.036	Øystein Løining (Public official)	284	1.000
8	Arne Nilsen (Politician)	153	0.906	Per A. Stalheim (Public official)	105	0.975	Ottar Dalsøren (Interest group rep)	284	1.000
9	Lars Aarvig (Interest group rep)	111	0.000	Eystein Gjelsvik (Interest group rep)	104	0.766	Rolf A. Skomsvold (Interest group rep)	284	1.000
10	Paul M. Dalberg (Interest group rep)	110	0.000	Årstein Risan (Public official)	103	0.035	Stein Reegård (Interest group rep)	283	0.177
	1981-89			1999 - 07					
1	Kirsten Myklevoll (Politician)	121	1.000	Erling Sundrehagen (Business rep)	343	0.997			
2	Hans Haga (Interest group rep)	115	0.005	Arnhild Taksdal (Public official)	325	0.996			
3	Walborg Krosshaug (Other)	92	0.951	Eystein Kleven (Public official)	311	0.995			
4	Tore Haugen (Politician)	85	0.949	Kari Rolstad (Interest group rep)	309	1.000			
5	Gerd Benneche (Other)	84	0.000	Kjersti Flaaten (Public official)	309	0.995			
6	Øistein Gulbrandsen (Interest group rep)	84	0.005	Stein Schjølberg (Consultant)	297	0.012			
7	Bernhard Nestås (Public official)	82	0.005	Erling Holmøy (Public official)	295	0.995			
8	Knut Korsæth (Public official)	82	0.913	Øivind Mandt (Public official)	295	0.995			
9	Olaug Granli (Politician)	82	0.913	Øystein Olsen (Public official)	295	0.995			
10	Gunvald Gussgard (Public official)	79	0.019	Olav Grimsbo (Interest group rep)	295	0.995			

* EV = Eigenvector

First, there are some new names in table 9, indicating that the way in which time is divided will affect who “makes the list”. However, many of the names are also found in tables 2 and 3 – or both. In addition, according to this table, other affiliations than the three affiliations of interest to this thesis can be found in many of the time-periods. Another interesting finding in this table is that some of the very central actors such as Stein Reegård, Øystein Løining and Erling Selvig, seem to be central between 1990 and 1998, and then again between 2008 and 2016, but not in the time-period between these two; 1999 - 2007. Løining, Selvig, and a fair share of the other names included among the most central actors are members of the “Banking Law Commission”, which is a reoccurring commission, and to a large extent explains why these members are so central, and why they seem to be very central for a long duration of time. Reegård has been the chief economist in Norway’s largest labour union (LO) since 1993, which also explains his extensive involvement and his centrality in the NOU-system.

Another interesting characteristic to take note of is the share of interest group representatives, which also in this table seem to increase. In the latest time-period between 2008 and 2016, six of the ten most central members are interest group representatives, which further supports the findings from table 8. There is a large share of public officials as well, which seems to be more constant for the whole data, and does not show a development of *more* public officials occupying the most important positions in the NOU-network. The increased influence of academic experts found by Christensen & Hesstvedt (2018) does not seem to be true for the structural elite in the NOU-system, perhaps with the exception of Selvig. Nevertheless, to be able to make claims about the importance of academic experts in the network more broadly, it is necessary to study a larger group than has been done so far. Before moving on to do so, however, one last topic should be addressed in this section, which is the potential influence of the commission leaders.

Being the leader of an advisory commission automatically places the actor in question in a position of power. The leader or commission 'chair' sets the direction for the work of the commission, in addition to representing the commission when in contact with the public sphere or the government. Christensen & Holst (2017) have found that academic experts largely replaced public servants in the position as commission chairs during the time-period between 1967 and 2013. Analysing this in a network perspective as well is useful to assess whether or not commission chairs are structurally more important than other commission members. In other words: whether the commission chairs are a part of the structural elite identified so far in this section.

Figure 6: Mean degree centrality for commission chairs

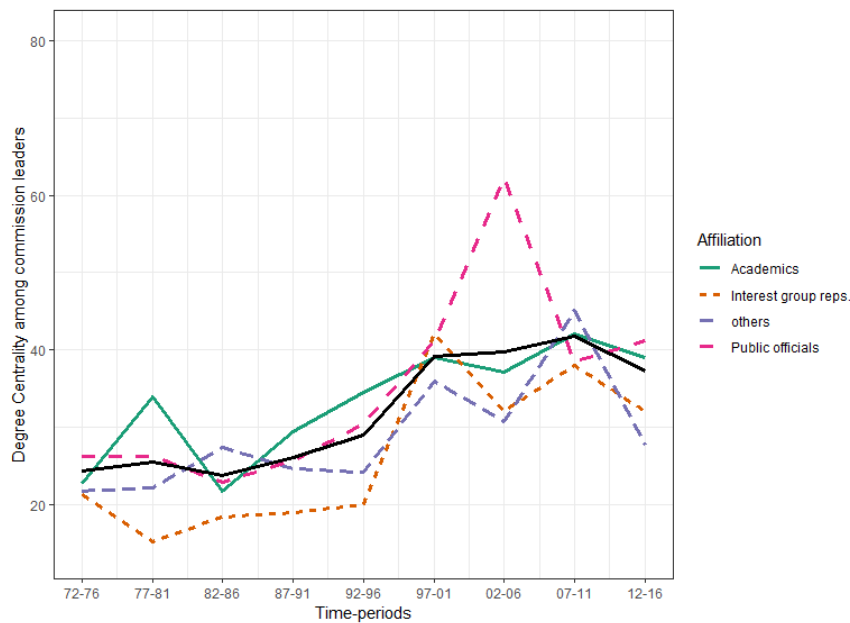


Figure 6 shows the average degree centrality for the different affiliations of interest among commission chairs. If comparing these centrality scores to the average degree centrality for all members in table 1, one can easily see that chairs do not seem to have higher centrality scores than the rest of the members on average. Commission chairs that are also public officials stand out as being more central than the other affiliations between 1997 and 2005. Interest group representatives that are chairs have centrality scores well below the average for the first half of the data, but comes closer to the mean for all chairs in the second half. Still, it should be noted that the share of interest group representatives who serve as commission chairs is extremely low in general (Christensen & Holst, 2017, p. 827). Academic experts seem to follow the mean quite closely throughout the data. To sum up, this figure shows that, on average, commission chairs do not seem to be more central than regular members.

Keeping in mind that the average centrality scores for commission chairs do not deviate much from the total average for all commission members, we now turn to identifying the most central commission chairmen. This will, in a more direct sense, address the extent to which the structural elite in the NOU-network also occupies the positions of commission chairs. Table 10 below shows the 3 most central commission chairs for all the 9 time-periods.

Table 10: Commission chairmen centrality over time

Name	Degree	Affiliation	Name	Degree	Affiliation	Name	Degree	Affiliation
1972-1976			1977-1981			1982-1986		
1 Dagfin Juel	240	Public off.	Olav Gjærevoll	126	Academics	Kirsten Myklevoll	166	Politician
2 Kåre Ellingsgaard	162	Public off.	Erling Haugen	104	Consultant	Tore Haugen	120	Politician
3 Torbjørn Mork	128	Public off.	Tore Grande	100	Public off.	Tore Lindbekk	74	Academics
1987-1991			1992 - 1996			1997-2001		
1 Nils Holm	96	Public off.	Svein Longva	198	Public off.	Erling Selvig	276	Academics
2 Magnus Aarbakke	94	Academics	Erling Selvig	192	Academics	Øystein Olsen	180	Public off.
3 Svein Longva	92	Public off.	Bernt H. Lund	108	Public off.	Svein Longva	164	Public off.
2002-2006			2007-2011			2012-2016		
1 Erling Selvig	352	Academics	Liv S. Taraldsrud	468	Consultant	Erling Selvig	288	Academics
2 Øystein Olsen	320	Public off.	Erling Selvig	420	Academics	Ådne Cappelen	236	Public off.
3 Svein Longva	200	Public off.	Øystein Olsen	192	Public off.	Jørn Rattsø	94	Academics

* **Bold** = Members who are also among the 5 or 10 most central, out of *all* members

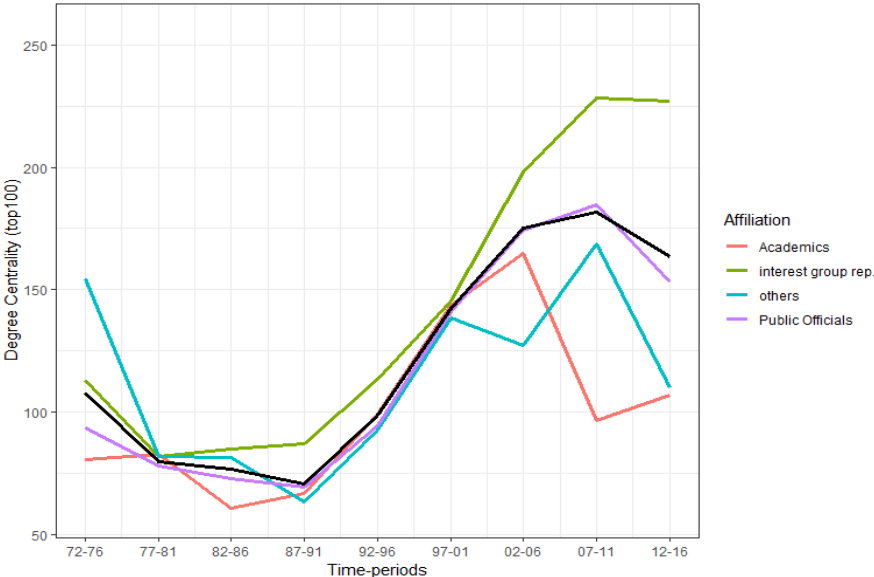
Table 10 gives an indication of whether the most central chairs in the NOU-network are also some of the most central actors in the network in general. The actors that have already been identified as a part of the top 10 or top 5 most central actors out of all the members, are featured in bold. With the exception of the first and last time-period, at least two of the three chairs have been identified as part of the structural elite earlier in this section. This indicates that some of the commission chairs are also very central to the NOU-network, which might enhance their potential for being influential further. For example, Erling Selvig, the academic expert, has been a commission chairman regularly from 1992 until 2016, giving him an increased potential to exercise influence for a fairly long period of time. On a more general note, public officials are largely the commission chairs that seem to be occupying most of the central positions in the network.

4.2.2 The experts are coming? Central affiliations in the NOU-network

Zooming out from the top 5 or top 10 most central individuals in the NOU-network, I now turn to analysing a larger group of people. I do this, primarily, because it cannot be assumed that only the 10 most central individuals are influential. Additionally, analysing 5-10 commission members does not allow us to view larger trends over time. Even if we cannot talk about statistical significance in a strict sense when dealing with network data, basing the analysis on more observations still increases the robustness of the findings. However, including too many commission members will potentially drown out the tendencies among the commission members who are most central to the network. In the following paragraphs, I will present the trends that can

be observed among the 100 most central individuals over time. It is important to note, however, that this threshold is more or less arbitrarily set to the 100 most central members. Still, robustness-tests have been performed for the top 200 commission members as well, which shows that the trends are similar for larger groups as well (see the appendix). Figure 7 below shows the mean degree centrality over time for the 100 most connected commission members over time. Not surprisingly, the mean for all affiliations increase over time partly because the overall number of connections among the 100 most central individuals increase over time. This trend was also observed for the whole network, as was mentioned in the section covering centralization. The difference is that in this case, the mean centrality does not vary between 26 and 44 ties per member on average, but rather between 120 and 170 ties on average.

Figure 7: Mean degree centrality for the 100 most central members by affiliation



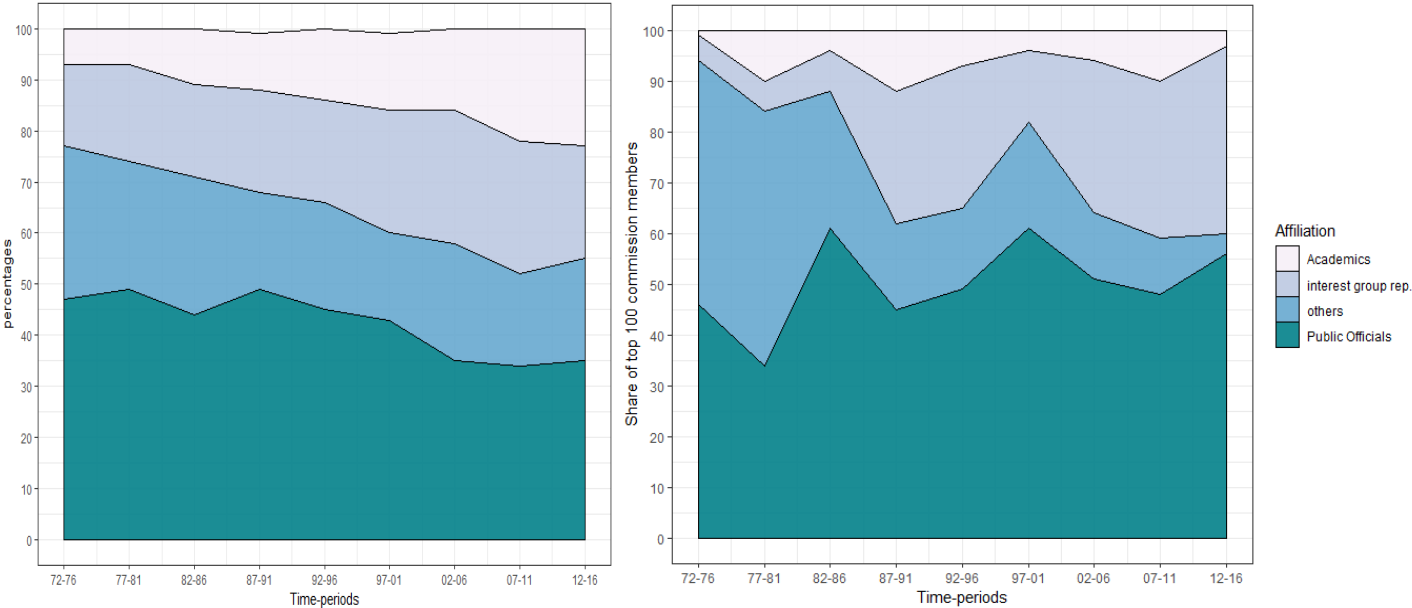
* Black line represents the average for all affiliations.

Looking at figure 7, it is evident that the 100 most central commission members had an average of around 110 connections in the 70s. This decreased towards the 80s, but from the early 1990 and until 2012, increased to an average of about 180 connections, before slightly decreasing to about 165. Interest group representatives had an especially sharp increase in degree centrality, ending at an average of about 225 ties per commission member with this affiliation. On the other hand, academic experts, although also experiencing an increase in number of ties, seem to have a decreasing degree centrality after 2006. Public officials seem to follow the mean centrality closely,

also having an increasing number of ties per commission member, but decreasing slightly in the last time-period between 2012 and 2016. In sum, this figure shows a growing tendency for all of these affiliations to have an increasing number of ties to other actors in the NOU-system, with certain variations, especially at the end. This is similar to the centralization trend observed in the last section, and the group trends also seem to support the results for the structural elite observed in the last section. It is also worth noting that the commission members seem to diverge more in their average centrality at the beginning and at the end of the data, than in the middle. This might indicate that there are some very central actors both in the early time-periods and in the later time-periods, skewing the average centrality for their affiliation. Looking at the results from table 5, it is very plausible that this is the case.

Figure 7 merely shows the average number of connections for commission members from different affiliations. Although not uninformative, we still cannot say anything about how many members from each affiliation are represented among the 100 most central actors. Furthermore, if there are fewer members from a given affiliation in the top 100, the mean centrality is also more likely to be affected by this in a more severe way. Figure 8 below instead shows the *share* of actors with the three different affiliations. This allows us to make more direct claims about the number of potentially influential actors from each affiliation among the most important commission members.

Figure 8: **a):** Total share of affiliations in commissions, and **b):** Share of most central (eigenvector) members



For comparison, figure 8a visualizes the share of members from each affiliation in the commissions in general. This is similar to what Christensen & Hesstvedt (2018) show in their article. To get figure 8a as close to the results of Christensen & Hesstvedt as possible, the secretariats are excluded from this figure, as it has been shown that the increase in expert participation is not true for secretariats to the same extent as for regular commission members. Figure 8b, however, only visualizes the 100 most influential actors with regard to eigenvector centrality, which as mentioned is one of the most satisfying indicators of potential influence.

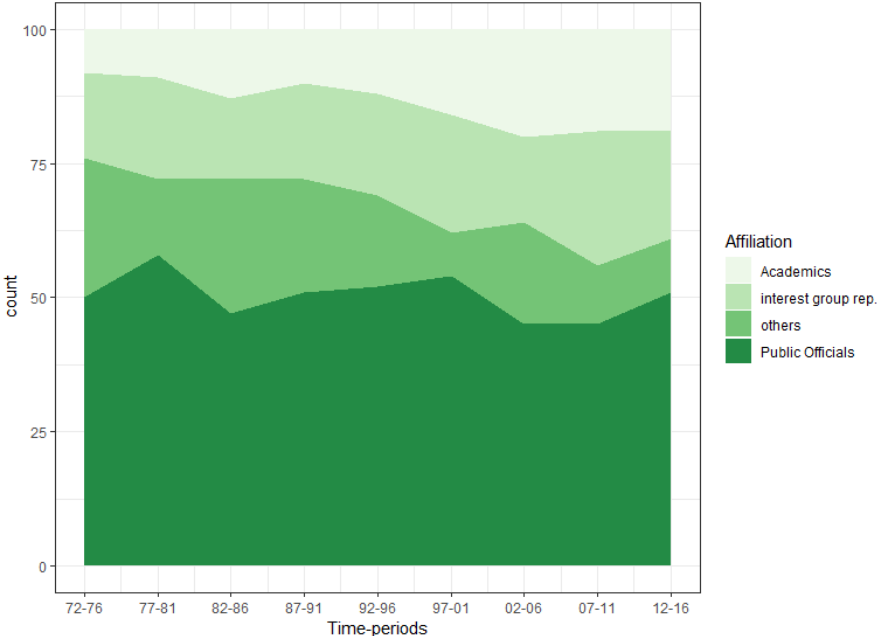
Figure 8b shows that public officials largely constitute more than half of the 100 most central members in the network according to the eigenvector centrality measure, with the exception of the two first time-periods. This is perhaps not surprising from a theoretical perspective, as it has been shown that public officials traditionally occupy a large share of public commissions. Nevertheless, these figures do provide some nuance to the trend observed by Christensen & Hesstvedt (2018), who find that the share of public officials in commissions has decreased markedly in the scope of the last 15 years. In comparison, figure 8a shows that public officials never constitute more than half of the commission members, and the share of public officials in total is decreasing. With this in mind, one could say that although the share of public officials in the NOU-system has decreased, they are still dominating the most central positions in the network. This would not have been possible to highlight by simply counting how many commissions each actor occupied a seat in as a proxy for influence. This approach would not account for the potential *range* of influence the actor in question had. As mentioned, having a high eigenvector centrality score substantially means that an actor “knows a lot of people who know a lot of people”. In this way, it is fair to say that public officials make up a large share of the most well-connected, and thus potentially very influential, actors in the network.

Furthermore, while academic experts seem to participate in the Norwegian advisory commissions to an increasing degree, they are not occupying central positions in the network to the same extent. When it comes to interest group representatives, the observed trend from figure 8a shows that the share of interest group representations in the advisory commissions remain fairly stable over time. Figure 8b, however, shows that according to eigenvector centrality, they are becoming extensively more central over time in terms of occupying a substantial share of the most central positions in the network. Interest group representatives made up about 5 to 10 percent of the 100 most central members until the mid-80s, at which point their share among the top 100 increases to about 40 percent. This is perhaps surprising from the empirical perspective that corporatism has declined in

the Nordic policy advisory systems since the 70s. Contrary to the findings of Christensen & Holst (2017) and Christensen & Hesstvedt (2018), Academics do not seem to become much more important in the NOU-system – at least when considering the 100 most central actors. It is evident from figure 8b that academics vary between constituting 5-10 percent of the 100 most central members, but there does not seem to be a clear trend in favour of more academic influence. This finding thus brings some nuance to the importance of expertise, at least in terms of how influential academic experts are in a social network perspective. Thus, although the number of academics in commissions increase, they are not taking over the most central positions in the network to the same extent. Additionally, it is worth noting that while eigenvector centrality was the chosen measure for figure 7b, the pattern is virtually the same with regard to degree centrality. This image is, however, a little bit different when we look at betweenness centrality.

So far, in this section, the focus has been on degree and eigenvector centrality, which as mentioned are the most straightforward measures of centrality to interpret. Examining figure 9 below, it is clear that also with regard to betweenness centrality, public officials make up the largest proportion of the commission members among the 100 most central members.

Figure 9: Area-plot over the 100 most central (betweenness) commission members by affiliation

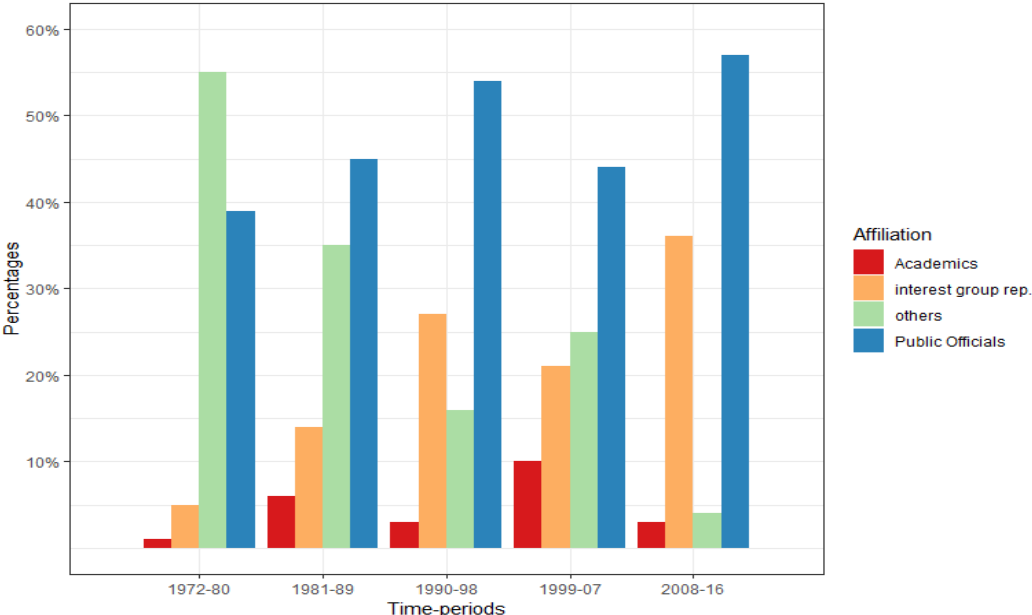


The share of interest group representatives seem to slightly increase at the expense of the group “others”, which as mentioned, is a group that include all other affiliations than the three that are of interest to this thesis. Furthermore, when looking at the share of academics, figure 9 shows a

more pronounced increase than was the case with eigenvector centrality. In other words, academic experts to an increasing degree occupy important positions in the network with regard to betweenness centrality. From constituting about 10 percent in the beginning of the data, to reaching roughly 15 to 20 percent towards the end, the share of academics in the top 100 most central members almost doubles. Also, remembering the tendency from figure 4 in the first section, all actors in the network become less central over time with regard to this measure, making the central actors relatively less central in the last time-periods. In any case, public officials constitute around half of the most central members when it comes to this measure as well, supporting the idea that bureaucrats are extensively involved in many aspects of the commission-work.

As mentioned in the previous section, there are certain problems with calculating centrality based on 5 year-networks, because one might miss some ties when limiting the network to 5 years. To check the robustness of the results from the graphs above, the time-periods are divided into 9 year-networks, with 5 different time-periods. When doing so, I again shift the focus over to eigenvector centrality. Figure 10 below shows the share of academics, interest group representatives and public officials among the 100 most central commission members.

Figure 10: The top 100 most central members in 5 different time-periods

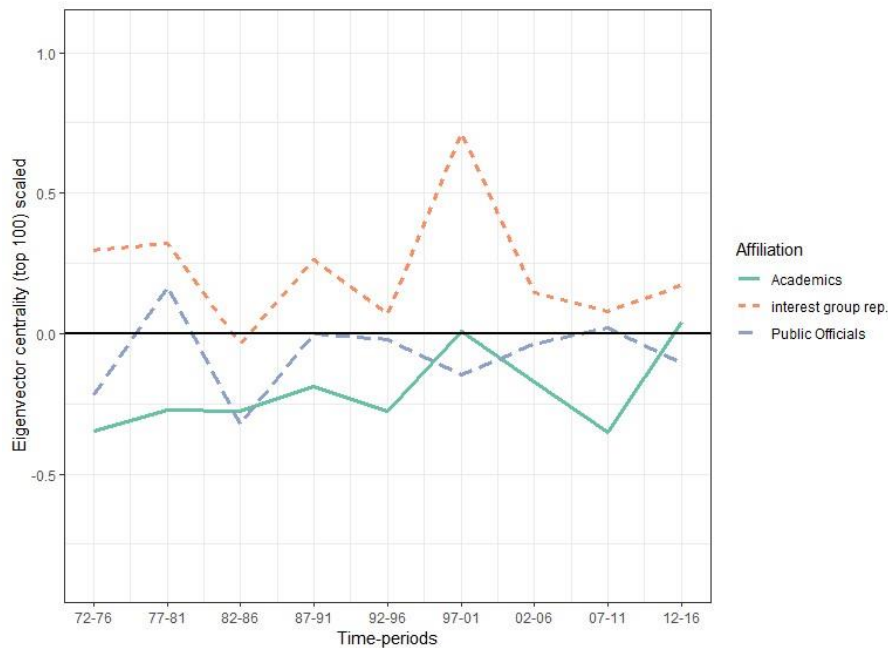


*Eigenvector centrality

Figure 10 shows some of the same trends as figure 8, for example that regardless of how time is divided, public officials make up a large share of the most central commission members. Still, there are some differences that are worth discussing. First, it seems that the category labelled “others”, which include the affiliations not relevant to the research question of this thesis, make up a much larger proportion of the 100 most central commission members when expanding the time-periods. However, the relative size of this group diminishes in the subsequent time-periods, and ends up at only 4 percent between 2008 and 2016. One of the reasons for this group constituting a smaller proportion over time might also be related to the fact that this group includes actors that had missing information on the affiliation-variable. Thus, we might see this trend simply because the amount of information available is larger in later time-periods. The results from figure 10 also seem to correspond to the findings in table 9, although for a larger group of commission members in this case. Second, academics seem to constitute a smaller proportion of the 100 most central members when larger time-periods are analysed, only reaching 10 percent between 1999 and 2007. Third, public officials, who make up 39 percent of the 100 most central commission members between 1972 and 1980, seem to steadily increase, and constitute 57 percent between 2008 and 2016. Lastly, interest group representatives, who perhaps surprisingly only make up 5 percent of the 100 most central members in the 70s, increase to a much larger proportion of the most central members in the last time-period. This trend evidently corresponds to the centrality analysis of the structural elite in the NOU-network, where interest group representatives to an increasing extent occupied a central network-position, visible both in table 8 and 9. In sum, it is safe to say that the primary results remain largely unchanged when accounting for differences in how the network boundaries are set with regard to time.

To be able to compare the structural importance of the different affiliation more directly, figure 11 below visualizes the *scaled* eigenvector centrality of the different affiliations. Scaling the values allows us to compare the affiliations more directly, because the baseline of zero represents the average value all of the members in each time-period, and the lines in figure 11 represent the standard deviation from this average. In figure 11, the scaled eigenvector centrality for the 100 most central commission members is shown by affiliation. As earlier mentioned, eigenvector is a good measure of potential influence, because it does not only take into account the structural position of the node in question, but also the structural position of the adjacent nodes. This is why this particular centrality measure receives more attention than the others.

Figure 11: Scaled eigenvector centrality by affiliation



* 0.0 represents the mean value for all members

This figure displays a similar tendency to figure 4, showing the group means with regard to eigenvector centrality for all commission members over time. In other words, compared to other members, the interest group representatives in the NOU-network are consistently more central than both public officials and academic experts. This tendency in many ways contrasts the view of declining corporatism in the Nordic countries. Academics on the other hand, seem to remain below the average, with the exception of the last time-period (when including 200 commission members, they remain below the average through the entire data - See appendix B4). This figure highlights a different aspect than is the case with the area-plots above, in that the value of the centrality scores are taken into account. The downside of a figure like this is that fewer commission members from each affiliation-group means that a few nodes will be able to affect the mean value more severely. However, the advantage is that we do not only observe the proportion of actors with different affiliations who are among the very central ones. We also have the possibility to observe *how much more central* actors from one affiliation are compared to the others. In other words, this figure compared to figure 8b shows that although interest group representatives do not make up as large of a share of the most central actors as public officials, their centrality scores are most likely more extreme than what is the case for public officials. The question of which affiliation, then, has the largest potential to be influential in the NOU-system depends on whether one highlights few actors

with a very large potential for influence, or slightly more actors with a little less potential to be influential.

Summing up the findings in this section, it is evident that although academic experts constitute a larger share of the member composition of the NOU-system in general, the same cannot be said when it comes to their centrality in the network. Among the most central actors in the network, public officials stand out as largely constituting 50 percent, regardless of which measure is employed, while the share of academic experts barely reaches 10 percent, and even decreases in the final time-period. Thus, there is no trend suggesting that they become more central over time. Interest group representatives, however, seem to occupy more central positions in the network over time. Interest group representatives also display the highest group average for centrality in the data, although this number is based on fewer members, which might affect the mean to a larger extent than with public officials.

5. Discussion: results and limitations

The aim of this thesis was to map the network structure of the NOU-system, as well as to analyse the relative importance of three different affiliations of interest, namely; Public officials, academic experts and interest group representatives. The first research question under study was: *What characterizes the network structure among members of Norwegian advisory commissions, and in what way has it changed over time?* To answer this, an analysis of the centralization and cohesion, as well as the aggregated centrality of the NOU-network over time was carried out. The second research question I posed was: *To what extent have experts, compared to actors with other affiliations, gained greater influence over time in terms of structural position in the network?* In the twofold centrality analysis, I highlighted both the structural elite of the network, as well as larger tendencies among the 100 most central commission members and their affiliation. In this chapter, the results of the analysis will be discussed both in terms of possible causes and consequences, and in light of existing literature on policy advisory systems. Furthermore, in this section I also address the topic of validity and reliability in relation to the research design and the methodological considerations of this thesis.

5.1 The implications of the analysis

In this section, I discuss the possible implications of the results of my analysis, in light of the theoretical framework presented in chapter 2. The structure of the following paragraphs will largely follow the structure of the analysis: I will first discuss the results with regard to the NOU-network as a whole, before moving on to the results regarding the node-level and group-level of the analysis.

5.1.1 The NOU-network

Centralization

As the analysis suggests, the network under study is becoming less centralized over time. In other words: the tendency for one commission members to be a lot more central than all others is steadily decreasing from the 70s, and reaches its lowest point in the time between 2012 and 2016. One of the reasons for this might be that commissions are generally larger, giving commission members a larger tie count on average. This in turn affects the sum of differences between the most central commission member and all others, resulting in the network becoming less centralized around one person. However, if there is a very central core of actors, this will also affect centralization negatively, although one then could speak of a group-centralization tendency. This is visible in the analysis of the structural elite, which shows that the most central members in the later time-periods are on average *more* central than the most central members in the early time-periods (see table 8 and 9). This underscores the tendency for a *group* of actors, rather than just one commission member, to become more central over time.

What could be the consequences of a less centralized network? One claim is that decentralized networks, as opposed to centralized ones, are usually more democratic when it comes decision-making (Freeman, 1979, p.216). If applied to the NOU-system, it would mean that decision-making within the advisory commissions has become more democratic. To my understanding, this claim cannot be directly applied to the case of the NOU-network without taking additional steps. The centralization-index only shows us the propensity for the network to revolve around one person, which would be surprising to find, seeing as the NOU-network is inherently characterized by a group-structure in the first place. It could be argued that since the differences in centrality between actors is smaller, this makes the NOU-system more democratic. Still, the analysis of the structural elite highlights that instead of one actor having more influence than the others, there is a group of actors that are increasingly central, which affects the centralization-index. When there is a group of actors becoming as central as we see in table 8, this means that the same individuals are repeatedly appointed to commissions, which might not be a very democratic feature. Therefore, without a more in-depth study of centralization and decision-making, we cannot presume that the NOU-network becomes more democratic over time.

Aggregated centrality

The results of the analysis indicate that the aggregated degree and eigenvector centrality in the network is increasing. This means that commission members now are on average more connected

than commission members were before. From looking at the results it seems like this might be a consequence of an interaction between commission-size and overlapping commission-memberships. The average commission-size has increased from about 9 to about 12 members per commission. Still, the average number of connections per member increases with 24 ties, which means that commission-size cannot be the only reason actors have become more connected. Thus, the explanation I provide is that it seems that the individuals that occupy seats in several commissions must, more often than not, find themselves in large-N-commissions, which gives them a higher tie-count. Furthermore, the aggregated betweenness centrality is decreasing, which might be a consequence of more members being directly tied to each other. What are the implications of the fact that commission members have become more connected on average? It was established early in this thesis that network centrality captures a relational aspect of influence. If everyone is becoming more central, this does not necessarily mean that all members are becoming more influential. Rather, it might decrease the relative value of each tie. This is because the concept of influence, when studying networks, must be analysed comparatively. Therefore, the analysis of how centrality is distributed in the network also differentiates between groups.

Differences in how centrality is distributed is not only relevant in terms of centralization. When it comes to aggregated centrality, we observe several differences in how centrality is distributed among the different affiliation-groups. The most pronounced tendency seems to be that interest group representatives have experienced a marked upswing in centrality in recent years. It is important to remember, however, that the different affiliation-groups have a different number of individuals belonging to each group. This affects the aggregated centrality-scores, as groups with fewer individuals will be more affected by “outliers”. For example, public officials constitute a large proportion of the commission members in total, which is most likely why this group does not deviate much from the total average. As was also touched upon in the analysis, the aggregated centrality-measures might possibly “drown out” the tendencies of the most influential individuals, simply because there are so many commission members with relatively low centrality-scores. Therefore, the aggregated centrality is useful to assess the overall distribution of centrality, but fails to tell us anything about the most central actors and their affiliation.

Cohesion

The third characteristic of the NOU-network is that it is becoming more cohesive over time. As mentioned in the theory chapter of this thesis, high levels of cohesion is often linked to better information-sharing, mutual trust, collaboration, and more conformative behaviour.

Unfortunately, it has not been possible to test these assumptions, as the data did not have information on any of these characteristics. Another claim, when it comes to policy networks, is that high levels of cohesion encourages consensus and compromise in legislative bodies (Aleman, 2009). We know from existing theory on the Nordic policy advisory systems that ad hoc advisory commissions are often consensus-seeking, and decisions are rarely made without agreement from all involved parties (Arter, 2016, p.193). There is, however, a possibility to express dissent in the commission reports, which one could interpret as the failure to reach consensus within the commission. Tellmann (2016) studied the extent to which members from different affiliations expressed dissent in the Norwegian advisory commissions, but there is no empirical evidence that the use of dissent in commissions has decreased (or increased for that matter) over time. Thus, it cannot be inferred that increased cohesion leads to a higher probability of consensus. In addition, there might be good reasons not to highlight the increased cohesion over time. First; this characteristic might very well just be a consequence of fewer commission members in the later time-periods. As stated by Borgatti et al. (2018, p.175): "... densities are almost always lower in large networks than in small networks". This does not mean that the results are insignificant, it merely reminds us that a logical consequence of fewer commission members over time, is that the overall connectedness of the network will be greater. Second; it is important not to overestimate the substantial meaning of the results, seeing as the increase in cohesion is relatively moderate at best.

The consequences of the empirical results are only discussed here as *potential* implications of the findings, seeing as the research design only opens up for a descriptive/interpretative analysis, not a causal analysis. Some of the reasons for this are discussed in the next section of this chapter, relating to methodological limitations. For now, it is enough to note that to be able to tie network structure more directly to certain consequences, further exploration of the NOU-network is needed.

5.1.2 Centrality and the three competing accounts

In chapter 2, some theoretical expectations were outlined mainly on the basis of the empirical findings of Christensen & Holst (2017) and Christensen & Hesstvedt (2018). The three expectations were as follows:

1. Civil servants have become less central in the network over time, weakening the state-centred account.
2. The corporatist account has been weakened over time, in the sense that interest groups representatives have become less central in the network.
3. The epistemic account is strengthened in the sense that academic experts have become more central in the network over time.

Regarding the results from the second section of the analysis, I am claiming that the findings of Christensen & Holst (2017), as well as Christensen & Hesstvedt (2018), can be nuanced in several ways that I will discuss closely in in this section. The expectations that were outlined on the basis of their findings cannot be said to receive empirical support from the analysis I have carried out. It is, of course, important to emphasize that very different studies have been carried out. One of the strengths of this thesis is that the use of network analysis allows for the NOU-system to be studied in a way that would not have been possible with conventional statistical analysis. Therefore, on the basis of my findings, I claim that the evidence for expertization of commissions can be nuanced when accounting for the social networks within the NOU-system, in the sense that academics are not as influential as one might expect from previous research. My analysis is of course focused upon a certain aspect of influence, relying upon a structural understanding of how social capital translates to an actor's importance in a social system.

The state-centered account

Several of the empirical findings in the analysis highlight the important structural positions in the network occupied by the civil service/public officials. The most striking one is perhaps the fact that public officials, throughout the entire 45 years of data, largely occupy more than 50 percent of the 100 most central network-positions. Although public officials have less extreme centrality-scores than interest group representatives, they continuously constitute over half of the most central commission members, regardless of how time is considered. Public officials are also, in general, more than any other affiliation among the 5 or 10 most central commission members in the network. With regard to the time-perspective, public officials do not seem to become less central in the network over time, nor does their centrality seem to increase. Rather, public officials seem to occupy important positions in the network, and their positions remain stable over time.

These findings are in some ways contrasting the existing literature on the field. For example, Hesstvedt and Christensen (2018) find that the share of public officials in the NOU-system in general has declined during the past 30 years. Thus, they conclude that the traditional state-centered account of the Nordic commissions is challenged. The way in which my analysis nuances this, is by showing that even though the share of public officials in advisory commissions might decrease in terms of member-composition, public officials still dominate the most central positions in the NOU-network. As mentioned in the theory section, public officials also largely control the process of appointing the commissions on behalf of their ministry. Hence, when we know that the bureaucracy often controls the appointment of commissions, often leads commission by being chairmen, and occupy most of the central positions in the NOU-network, their potential influence in this specific policy advisory system can hardly be overestimated. Halligan (1995) argued that policy advisory systems can be characterized by their degree of government control. Considering the results within this theoretical perspective, one could say that the NOU policy advisory system is one of fairly extensive government control. In any case, the results of this thesis point towards the public officials or civil servants to be more “powerful” than some earlier research would suggest. Still, Christensen (2017), does assert civil servants within the state as particularly influential in economic policymaking. In light of this, my results are perhaps less surprising.

The epistemic account

A couple of things speak in favour of the potential influence of the academic experts in the NOU-network. First, the most central commission member in terms of the absolute number of ties to other members is the academic expert Erling Selvig, who has also served as commission chairman several times, increasing his potential to be influential. Second, with regard to betweenness centrality, half of the 10 most central members in the entire network are academic experts, placing actors belonging to this particular affiliation-group in important structural positions in the network. Both Selvig and most of the other academic experts that were identified as part of the structural elite in section 5.2.1, belong to the academic fields of either law or economics. This might be linked to specific attributes of the commission reports. Occasionally, there will be specific societal problems in which policymakers need specialized expertise within a specific policy-field. More often, however; to be able to make policy-recommendations or draft bills, the commission in question need actors with legal expertise. In addition to this, the largest share of the commissions in the data are appointed by the ministry of finance, and it is therefore not surprising that there are economists as well among the most central academic experts.

When looking at larger trends, and not only the structural elite in the network, academic experts do not generally occupy important positions in the NOU-network. Nor does this seem to increase over time, at least when examining degree and eigenvector centrality. The share of academic experts among the 100 most central with regard to betweenness centrality is somewhat increasing, but not by much, and nowhere near paralleling the absolute increase of experts in terms of member composition in general. This nuances the findings of Christensen & Hesstvedt (2018) in a different way: while the academic experts to an increasing degree make up a larger share of the advisory commissions in general, they are not to the same extent becoming increasingly central in the network. If anything, the academic expert's centrality scores rather seems to decrease from the late 90s until recent years, which can be interpreted as their influence decreasing in the NOU-system. One plausible reason for this is that academic experts are appointed to commissions on the basis of their expertise in a certain field, and this expertise is likely to be very specialized. Furthermore, it might not be likely that their exact expertise will be needed in a large number of commissions over a relatively short time-span. Therefore, although the government make use of expert knowledge in more instances than before, the expert's opportunity to become influential in the network is limited because their expertise might be highly specialized and irrelevant for a large number of commissions. The exceptions to this seem to be the academic experts within the field of law and economics, as mentioned above.

It is, however, again important to stress that the research design allows for a certain aspect of influence to be studied, and that other kinds of academic influence is not taken into account in this thesis. For example, Tellman (2016) find that academic experts have great influence within the commissions during deliberations. Additionally, Christensen & Holst (2017) find that the extent to which commission reports utilize academic research has increased drastically in recent years. It should be mentioned, however, that the divide between academic experts and public officials can sometimes be artificial, as public officials often are experts in their field as well. Most public officials have university degree. Still, in this thesis, I have explicitly differentiated between academic expertise and other forms of expertise.

The corporatist account

Perhaps the most surprising findings in this thesis relate to the corporatist perspective. Contrary to the idea of “declining corporatism in Scandinavia”, interest group representatives have not become less central in the network over time. Rather, they seem to constitute more of the structural elite, and make up a larger share of the 100 most central individuals in the NOU-network in recent years

than in the 70s, and 80s, which was perceived to be the height of Scandinavian corporatism (Blom-Hansen, 2000, p.165). Not only has the proportion of interest group representatives among the most central commission members increased far more than the other affiliations, interest group representatives consistently also have more extreme centrality scores than both public officials and academic experts on average. In other words, when utilizing network centrality among interest group representatives as an indicator of the extent to which the NOU-system is characterized by a corporatist approach to policymaking, one can argue that this specific policy advisory system has strong corporatist component. In line with the argument earlier in this section, Halligan (1995) characterizes policy advisory systems by the extent to which they are under government control, or has strong features of external interests. As such, one might infer that there is a tendency for the Norwegian political system to emphasize the organized external interests, even in the government-controlled NOU-system. This tendency, although contrasting some recent studies of corporatism in the Nordic countries, is fairly coherent with others. For example Binderkrantz & Christiansen (2015, p.1036) find in their study of the Danish public committees that relative to the decrease of committees in general, the interest group participation has increased, and more seats in these committees are occupied by interest groups. From the point of view of this thesis at least, one cannot discard the influence of corporatism in the NOU-system.

5.2 The limitations of the research design and analysis

In this section, the limitations of this thesis and considerations of validity and reliability will be discussed more in depth.

5.2.1 Problems with the research design and the network-approach

As mentioned, the approach of network analysis has made it possible to determine extent of cohesion and centralization among the actors in the NOU-system, as well as providing a measure of influence that has not been explored in this context before. However, this way of analysing the policy advisory system of the public advisory commissions also has its limitations. In the following paragraphs, these potential problems will be discussed.

First of all, some attention should be drawn to the specific problem of the nodes and ties of the NOU-system. Because the commissions are appointed, the members in general do not choose how many or with whom they form ties. The ties are simply operationalized as shared group membership in a commission. Still, there is a possibility that many of the actors in the network that do not have ties to each other in the NOU-system, might still be affiliated by other group-membership in the Norwegian political sphere or in private. For example, other scholarly contributions point to these informal networks between policymakers (particularly economists and politicians) within the state (Christensen, 2017). I cannot in this thesis, say anything about relationships beyond the NOU-system, which relates to how the ties are operationalized. The connections between members in the network constitute *formal* ties from shared commission membership. This means that the discrepancy between the observed network and the true network may be insignificant, or it may be quite large. Nonetheless, I have been able to make claims about the characteristics of the network on the basis of the observable formal ties.

Second, the NOU-network is only partly analysed as a whole, but most of the analysis is concentrated around results from smaller networks, particularly 5-year networks. The problem with this, is that ties between nodes in different time-periods are not counted. In turn, this affects the centrality of members who occupied seats in several commissions in multiple time-periods negatively, while members that occupied seats in several commissions within the 5-year time-periods will get the correct tie-count. It would, however, not be possible to track changes to the NOU-network over time, had this not been done. To check for robustness in terms of results from the 5-year networks, 9-year networks were also studied. This made it clear that the general empirical findings were largely the same, regardless of how the networks were split.

Third, it may be viewed as problematic that I do not directly explain *why* we observe the tendencies that the analysis indicates. Claims of causal inference are usually problematic in the social sciences, and even the most robust research designs face challenges when it comes to inferring from cause to outcome (Laursen, Little & Card., p. 7). Analysing networks additionally face different challenges than most statistical research designs. Statistical inference is to conclude that something happens more or less often than can be explained by chance, based on the number of times a phenomena occurs in a sample of independent observations (Laursen et. al., p. 521). As elaborated earlier, ignoring the nonindependence that is present in social networks will lead to bias in statistical tests. A network-approach would have solved the potential problems of not being able to make causal inferences about the commission members because the nonindependence between them could have been modelled rather than ignored. However, I am not in this thesis utilizing the network-

approach for causal analyses. There are at least a couple of reasons for this. First, when a field is practically unexplored in terms of the methodology that is introduced, simply mapping out the main features of that field is necessary. This was done in this thesis, by analysing broad tendencies at the network-level, as well as identifying the structural elite, and analysing tendencies at the node-level and group-level to make claims about centrality. Second, causal analysis when it comes to networks requires quite comprehensive simulation-based research designs. This on its own would have been a large task to take on, and when there is a need to first map the network structure and characteristics, it appears to me that a causal simulation-based research design in addition to this would have been a far too comprehensive design for a master thesis. Therefore, a descriptive analysis was carried out, followed by a theoretical discussion about the possible consequences of the results.

5.2.2 Validity and reliability

Having mentioned the limitations of the research design and the problems when working with network data, I now turn to assessing the validity and reliability of the measurements this study, as well as evaluations of generalizability, and suggestions for further research.

Validity

First, I would like to draw attention to the validity of the concepts that I am measuring in this thesis. This includes content validity, and construct validity, which are two types of measurement validity introduced by Adcock and Collier (2001). Content validity is the extent to which an indicator "... adequately capture the full content of the systematized concept" (Adcock & Collier, 2001, p.538). Construct validity refers to the extent an operationalized variable actually measures the relevant concept (Lund, 2002, p. 6).

I begin by discussing the most important concept in which is the foundation this thesis is built upon, namely: influence. In terms of content validity, one could say that using only network centrality is not enough to fully capture all aspects of being influential. Therefore I would regard this type of validity as potentially quite low. To exemplify this, think about the commission chairs, which we know from earlier studies have a lot of influence (Ryymin, 2017; Brochmann, 2019). In the analysis of commission chairs in section 4.2.1, it is clear that far from all the most central chairmen are defined as a part of the structural elite that were based only on centrality scores. Thus,

we know that the chairmen are influential, but this is not necessarily captured by the centrality measures employed in this thesis. This also touches upon the construct validity: am I actually measuring the concept of influence? I would argue that the different centrality scores undoubtedly measure the aspect of influence that I am interested in. Using different measures of centrality as a proxy for influence might seem like an unconvincing operationalization to some, but as mentioned in the theory-chapter, the understanding of influence as a social-structural phenomena builds on theories of social capital. With this in mind, network analysis might be one of the best ways to actually measure an actors' level of social capital within a defined social system (in this case, the NOU-system). The issue arises when attributing high levels of centrality or social capital to the concept of having influence. This is partly solved by the definition of social capital, which implies that the *potential* to influence others is enough to be influential. This is also why – throughout the analysis – I am careful to use phrases such as “potentially influential actors”. The point is that I am definitely not measuring all aspects of influence in this study of commission members, but on the other hand, the aspect of influence that I am trying to measure, is indeed measured very well, and could not have been measured in any other way.

The second discussion of validity relates to how the affiliations of the different actors are used as indicators of different approaches to democratic policymaking in the NOU-system. The level of corporatism is measured by the extent of interest group representatives in central positions in the network. Similarly, evidence for the state-centered account is measured by representation of public officials, and evidence for 'expertization' is measured by the extent of academic experts in central positions. A critique of the content validity in this case would be that simply because actors with a certain affiliation tend to be central in the NOU-network, it does not mean that this is indicative of the different approaches to democratic policymaking in the NOU-system. It might be true that these indicators do not capture the full extent of the three different approaches to policymaking. For example, different measures, such as member-composition, citation practices, deliberations within commissions, and control over member-appointments are also indicators of these approaches. Therefore, the measure I am employing must be seen in a larger context, and as a measure that contributes to other previously developed indicators. To assess the construct validity in this case, an evaluation of whether the affiliation-groups are representative of different democratic approaches to policymaking or if they capture something entirely different, is necessary. The use of affiliation as indicative of different approaches to governance in this thesis corresponds to how the presence of different affiliation-groups have been used in previous studies to assess different accounts of policymaking (Christensen & Hesstvedt, 2018). The potential problem, in my

view, is not that the affiliation-variable could measure something else, but rather that I measure “nothing” as “something”. In other words: there could be too much room for interpretation. However, in line with Halligan’s argument (see section 3.2.2), I argue that it is reasonable to treat the affiliation of commission members as a proxy for different approaches to democratic policymaking.

Reliability

Reliability refers more directly to the data and possible errors that might be present. Some problems in the data with regard to missing values, and what is referred to as falsely disaggregated nodes, have already been discussed in section 3.3.2. As mentioned, the extent of missing observations is extremely low, which is not very surprising as I am studying archival data. The possible dangers, however, is in the sensitivity for misspellings in the coding of commission members’ names. The recoding of about 500 misspelled names was necessary to be able to perform the analysis with some confidence that most of the ties would be coded correctly. Still, it is not possible to be absolutely certain that this eliminated all the misspellings. This problem may have led to some ties not being observed, but it is not likely that an extremely important commission member was overlooked, as their names have necessarily reoccurred so many times that they would be hard to miss. In terms of other measurement errors, a problem might be that the affiliation of a given actor is not constant throughout the data, which I solved by using the mode of the affiliation-variable for a given actor in each time-period. However, this means that an actor could be regarded as only a public official within a time-period he/she was both serving in a commission as a public official at one point, and as a politician at another. Thus, this might lead to some oversimplification of the data, and loss of information. Still, in order to analyse the commission members by affiliation, some sort of recoding had to be done, in which this seemed like the most reasonable option. In addition, reliability also relates to the transparency of the gathering and processing of data (Kehoane, Verba & King, 1994, p.23). In this study I have to the best of my ability explained the data coding, processing and procedures in such a way that the quality of the study should be straightforward to assess.

Problems of generalization

This thesis has provided a reliable description of the social networks within the NOU-system, and the centrality of certain actors, but it may lack in terms of generalizability. At least statistical generalizability is not generally an option when working with network data. Statistical generalization is possible when the study utilizes a sample which represents a population of some sort. In this

thesis I have quite literally studied the whole population. I did, however, in section 2.1, argue that the Norwegian ad hoc advisory commissions can be treated as a case of policy advisory systems within knowledge regimes, within the Nordic model of government. This is more related to what Cook and Campbell calls external validity (Cook and Campbell as cited in Lund, 2002, p.105), and concerns whether or not the findings are generalizable to other relevant individuals, situations or times. External validity is threatened when there are systematic differences between the case being studied and the population of cases one would like to generalize the findings to (Lund, 2002, p.122). We know that the use of ad hoc advisory commissions have been used extensively in all the Scandinavian countries, but we also know that these commissions have undergone significant country-specific changes in the last decades (Christensen, Gornitzka & Holst, 2017, p.251). This, combined with the nature of network analysis from a statistical point of view, makes it difficult to assert the external validity of my results as high.

6. Conclusion

In this thesis I have analysed the system of Norwegian official commissions as a social network. I have studied both network-level characteristics and group-level characteristics, as well as centrality at the node-level. The latter was done within a theoretical framework of three somewhat competing approaches to democratic policymaking. In this chapter, I aim to sum up the main results of the analysis, and conclude with regard to the findings in this thesis. Furthermore, there are undoubtedly some things that would be interesting to study but fall out of the scope of this thesis, and is therefore discussed as suggestions for further research.

6.1 Summarizing the main findings

Starting with the network level of analysis, the findings were partially in line with the expectations I outlined in section 2.4. The NOU-network is first of all generally not cohesive, which is shown by density-measures below 0.01 in the early time periods. The level of cohesion increases, but only to about 0.02, which is still a fairly low density-score, even for a network of this size. Furthermore, I was not able to test the typical consequences of increasing network density, and even if it had been possible, the effect would most likely be too small. Thus, the substantial meaning of increased cohesion should not be overestimated.

Second, I find that the network is becoming less centralized. The centralization index, in which the most central actor is compared to all others, indicate that the network to a lesser extent seems to revolve around one actor. In other words: the difference between the most central actor and the other actors in the network becomes smaller over time. It does, however, start out by being quite centralized, most likely because there are a lot of commission members with low centrality-scores. The effect thus might be a consequence of the substantial amount of actors that are becoming more central in the network over time.

With regard to aggregated centrality I find that the average degree and eigenvector centrality increases, while the aggregated betweenness centrality decreases. The reason for this is that more

actors are directly tied to each other, and thus fewer actors occupy the connecting positions in the network that are captured by the betweenness centrality measure. Furthermore, these trends have consequences for the analysis of the structural elite. They indicate that the actors who has a high degree- or eigenvector centrality score in later time-periods are relatively more important than the ones who had high centrality scores on this measure earlier in the data. Similarly, the actors who had a high betweenness score at the beginning of the data were relatively more important than the ones who “made the list” in later time-periods.

In terms of the second research question, and the node-level of analysis, I cannot claim that the theoretical expectations have been confirmed. Moving further into the matter of the structural elite, some interesting tendencies can be highlighted. First of all, there are very few academic experts in the structural elite when looking at the degree and eigenvector centrality scores. This is with the exception of the member who by far is connected to the most individuals in the network, Erling Selvig. Other than him, the structural elite is dominated by public officials, and to an increasing degree, interest group representatives. Some of these members are not surprising to find among the structural elite in the network, for example Reegård who served as the chief economist in Norway’s largest labour union, LO, or Løining who served as head of one of the departments in the Ministry of Finance. The analysis of the structural elite also shows us that network analysis is somewhat sensitive to how time is divided, which reminds us that when assessing the most central members one must be careful to not make strong claims about change over time with regard to the most central actors. However, a handful of members remain on the top of the list regardless of how time is treated, which is a good indicator of their important position in the network. The analysis of the commission chairs indicate that while some of the most central actors in the network have served as commission chairs, they generally do not seem to be much more central than the average commission member.

The broader analysis of the 100 most central commission members largely shows the same tendencies, only for a larger group of actors. The most important finding with regard to the second research question is perhaps the fact that even though academic experts are constituting a larger share of the commission members in total, they are *not* becoming increasingly central to the network. At most academic experts constitute around 10 percent (sometimes only around 3 percent) of the 100 most central members, and their group average suggest that they are among the least central members in the top-100 list. Public officials on the other hand, consistently make up around half of the 100 most central commission members. Still, the group mean for public officials is also below average. Interest group representatives show a remarkable increase the share

they occupy among the 100 most central members. In addition to this, their group-average is consistently higher than for both academic experts and public officials. This tells us that in the case of the NOU-system, the corporatist and state-centered approaches to policymaking still hold a strong position. The arguments of expertization, then, seem to not be as relevant in terms of the relatively peripheral position most academic experts have in the network. This being said, the academic influence in the NOU-system is of course visible in other ways, such as in citing practices or member-composition. When employing a network-approach, however, one should not overestimate the possible influence of academic experts and in the epistemic account.

6.2 Further research and last comments

6.2.1 Further research

There are several lines one could move along, to build upon the results of this thesis. As mentioned earlier in the discussion of results, the possible implications of my findings are merely discussed in light of theory, and not actually tested. Now that many of the general network-characteristics have been mapped, a natural step forward would be to assess the actual significance of different network characteristics on relevant dependent variables. This can be done by drawing a smaller sample from the NOU-system, and proceed with a simulation-based approach. Simulation would solve the problem of not being able to test causal hypotheses with regular test-statistics on this data, as the units of analysis are not independent. Still, another problem is that it is difficult to make causal inferences about interesting dependent variables such as commission impact when there is no data covering this aspect. Thus, gathering more information on the significance of commission reports in terms of whether legislation was adopted, or in terms of media-coverage would be a very interesting variable to examine in relation to network-variables.

The results of this thesis has shown that there is a group of actors that are potentially very influential on the basis of their centrality scores, the group that I labelled “the structural elite” in the network. However, it could be contested whether being a part of such an elite has any significance at all if they are not aware of their potential themselves. Now that we know who these actors are, an interesting topic of inquiry would be whether they reflect upon their potential for influence caused by their structural position in the network, making them able to reach a lot of other actors with their ideas. A study of this kind would have to take a more qualitative approach, and thus highlight what it means substantially for the actors in question.

Lastly, it would be interesting to investigate actors with other affiliations more in-depth. In this thesis the focus was directed towards interest group representatives, public officials and academic experts, as representatives for different democratic approaches to policymaking. Still, although these groups constitute a large share of the NOU-network, many other affiliations are important as well. For example, it became clear that in the earlier years of the NOU-system, other affiliations (such as politicians) than the ones under study occupied a large share of the most central positions. Looking into possible reasons for why this is no longer the case would be a very interesting study indeed.

6.2.2 Concluding remarks

The main contribution of this thesis has been the way in which SNA was utilized to shed light on a policy advisory system previously only studied with standard statistical approaches. This has highlighted new aspects of being influential that is only possible to highlight with the use of this methodology. As mentioned, the findings in this thesis cannot necessarily be generalized to other policy advisory systems, or even other commission-systems in Scandinavia – however similar the systems might be in other ways. This has to do with the statistical properties of SNA. Networks are often so deeply affected by even the smallest changes or variations that they must be studied as exactly what they are. However, in this thesis I show that there is certainly a potential for generating more knowledge about policy advisory systems by studying them as networks.

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Appendices

A) Excerpts from the EUREX-codebook

1. Coding of members and secretariats (p.8)

2. Members

We define members of commissions as

- I. Persons that are initially appointed to the commission, and
- II. members who are appointed later *and* do not replace an existing member

If the commission member is also a secretariat member, we count the person both as a secretariat member and a commission member. For multi-report commissions, the relevant period is defined by either a) the time of reappointment/new task, b) submission of previous report or c) the period when the commission worked on a specific task. We base our coding on the commissions' own description of who contributed to the report.

The following persons are excluded as members:

- I. Members who are appointed to *replace* an existing member
- II. Deputy members (*varamedlemmer*) are not counted as members
- III. Observers (*observatører*) are not counted as members
- IV. Members of working groups (*arbeidsutvalg*) under the commission who are not also part of the commission itself are not counted as members

Chairmen: We count the person that was initially appointed as chairman, or the person who were appointed to replace a chairmen that left the commission (e.g. in case of demise). Max. 1 chairman per commission.

3. Secretaries

We define secretary members as

- Persons who are initially appointed to the secretariat, and
- secretariat members who are appointed later *and* do not replace an existing member

For multi-report commissions, the relevant period is defined by either a) the time of reappointment/new task, b) submission of previous report or c) the period when the commission worked on a specific task. We use commission's own description of who contributed to the report as guiding.

In addition, the following is included in our definition:

- Secretariat members who participate part-time
- If secretariat is located in an organization but name of secretariat member is not specified, this is counted as 1 one secretariat member from that organization
- Secretariat members who are also a member of the commission itself

Excluded from our definition:

- i. Secretariat members who are appointed to replace an existing member
- ii. If an organization has supported (*bistått*) the secretariat, this is not counted as a member

2. Coding by affiliation (p.9-12)

Coding and specifications

1. Member-level variables

1.1 Composition

Composition of commissions is coded by classifying members and secretaries according to their affiliation/organization/employer. We base our coding primarily on information listed in the reports. If the report lacked this information, we proceeded with retrieving information from other sources: newspaper articles (www.retriever.no), personal home pages, CVs found online, etc.

We define affiliation as the member's affiliation at the time of appointment. If he or she is listed as "former [MP/civil servant/etc]", he or she is coded as "other member" (see categories below). We treat the categories as mutually exclusive and a member is hence only listed with a single affiliation. In cases where the member/secretary was listed with multiple affiliations in the report (e.g. institutional affiliation and a trade union), the affiliation that is listed *first* is coded.

Members and secretariats were ascribed to one of the 10 following categories (variable in dataset: *composition*)

1. Academics
2. Ministry officials
3. Public officials
4. Interest group/stakeholder representatives
5. Business representatives
6. Consultants
7. Judges
8. Lawyers (in private practice)
9. Political representatives
10. Other members
11. Missing: members with unknown affiliation

1.2 Academics

Definition: A person employed in an academic position at an independent research institution.

- By "a person in an academic position" we mean persons that holds a PhD and is currently employed in a research position, such as professors, associate professors/førsteamanuensis, phd fellows, docents, assistant professors, forsker 1, forsker 2, etc.
- By "independent research institution" we mean non-partisan, non-governmental establishments that are founded for doing research (and not only teaching, vocational training, etc).

Included in this definition:

- Academics at universities and høyskoler. Examples: University of Oslo, University of Tromsø, NTNU, Oslo Metropolitan University, Høgskolen i Innlandet, NHH Norwegian School of Economics, Norwegian Business School (BI).
- Independent research institutes and research centres. Examples: Fafo, Institute for Social Research (ISF), Peace Research Institute Oslo (PRIO), Norsk institutt for naturforskning (NINA), Norsk institutt for vannforskning (NIVA), etc.
- Retired researchers (emeritus).

Excluded from the academic definition:

- Administrative staff at academic institutions (secretaries, auditors).
- Rektorer, directors and other chairs of academic institutions that do not hold a PhD and have an academic track record
- Persons employed in “research agencies” – that is, organizations that are defined by law as agencies (in Norwegian: “direktorater”). This include Statistisk Sentralbyrå, Folkehelseinstituttet, Havforskningsinstituttet, Polarforskningsinstituttet.
- Persons employed at non-academic teaching institutions, e.g. folkehøyskoler and yrkesskoler (vocational schools).

1.3 Public officials and civil servants

Definition of a public official: A person employed in the public sector (excl. ministry staff)

Definition of a civil servant: A person employed in a ministry.

Included in this definition:

- Civil servants: Every person employed in a ministry
- Public officials: All public officials are coded according to a detailed coding scheme, see table 3 below.

Excluded from category:

- Judges and employees in courts (see separate category)

1.4 Interest group representatives

Definition: Persons representing an interest groups/non-governmental organization/stakeholder group

Included:

- Persons representing organized interests, such as labour unions (LO, YS, Unio), employer’s associations (NHO, Virke, Spekter), professional organizations (Legeforeningen) and organized citizen groups.

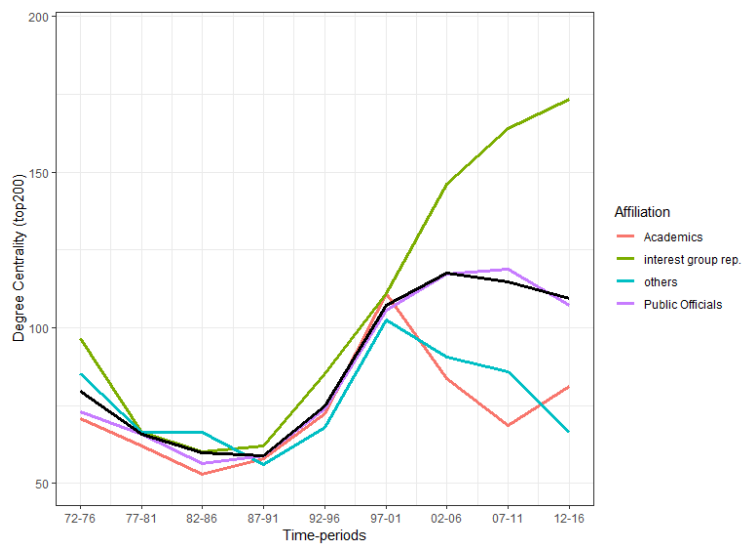
Excluded:

- Single-persons representing non-organized interests, e.g. a general group such as “patients”, “teachers” or “pupils”

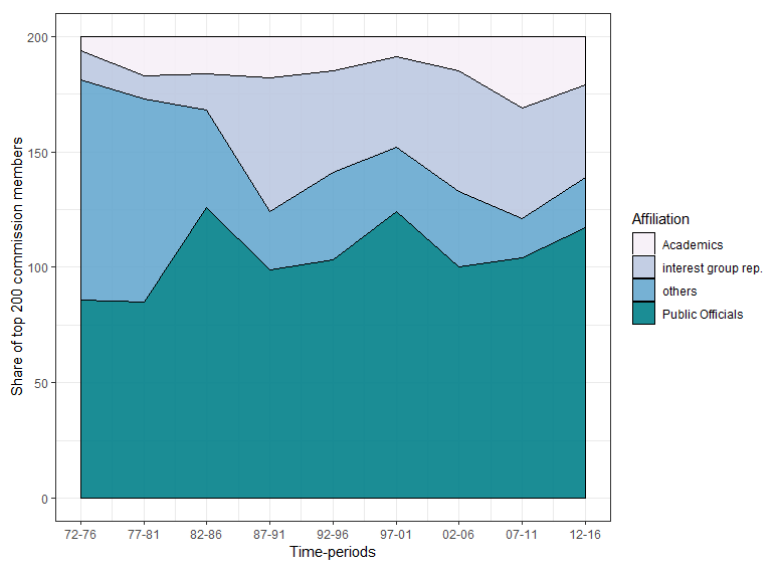
B) Figures from analysis with 200 most central commission members

These figures show that the main trends in section 4.2.2 are still prevalent when including the 200 most central commission members in the analysis.

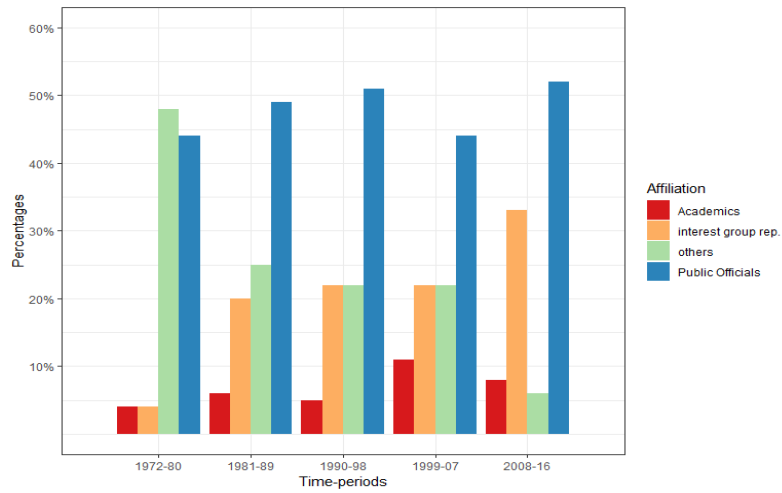
1. Figure 7 with 200 commission members



2. Figure 8b with 200 commission members



3. Figure 10 with 200 commission members



4. Figure 11 with 200 commission members

