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Collaborative Management in Norwegian Municipalities: Do Middle Managers Make a Difference? Are Vegard Haug*

Abstract¹

Norway is an example of the Nordic model in which the local level is of fundamental importance. However, the municipalities are relatively small and increasingly subject to decentralisation of their activities. To compensate for scale disadvantages, a mixture of collaborative activities is pursued in order to build system capacity. Paradoxically, little is known about collaboration among key stakeholders. This article makes a contribution to reducing this knowledge gap by focusing on mid-level managers and municipal departments. This research is empirically underpinned by a cross sectional survey of middle managers in 64 municipalities in Norway (N = 1354) and presents, for the first time, comprehensive data on collaboration across the entire municipal sector. It shows that collaboration does exist among municipalities, but that there is significant variation between sectors and types of collaboration. Furthermore, the classic distinction between locals and cosmopolitans is observed, though also an interesting new group of middle managers - "glocals" - who combine local and cosmopolitan orientation. The combination of delegation and entrepreneurial leadership is shown to be particularly important when explaining variation, as delegation creates a greater scope for collaborative management. Interestingly, entrepreneurs in particular appeared to be moving into this area, thus enabling greater innovation and development.

Introduction

In recent years, collaborative management (CM) has emerged in public administrations as an important supplement to traditional coordination mechanisms such as hierarchies and markets (Powell, 1991, Agranoff, 2012). CM is broadly defined as: "a concept that describes the process of facilitating and operating in multi-organizational arrangements to solve problems that cannot be solved, or solved easily, by single organizations" (Agranoff, 2012:2). This development is particularly evident in municipalities (Swianiewicz & Teles, 2018). However, despite substantial research into how CMs are organised and managed, we know less about how the collaborative trend is expressed and is unfolding in the most extensive part of the municipal sector, namely at the departmental level - an arena dominated by middle managers: principals, preschool managers, leaders of health departments, cultural institutions, technical services, and so on.

This article seeks to reduce this knowledge gap, thus providing an input into the general understanding of collaborative management. The goal is to identify and explain the breadth and scope of CM across sectors in the everyday operation of municipal middle management in Norway. In doing so, it asks the following questions:

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How much collaboration is there at the intermediate level? Are there variations between the sectors, or other patterns of collaboration? Finally, how can variation in collaborative management be explained? Do middle managers make a difference?

The article is divided into four parts: firstly, a discussion of key theories surrounding collaborative research in public administration. The research design and methodological approach (i.e. quantitative analysis of survey data) are subsequently presented, followed by the empirical analyses in two steps - firstly by describing the empirical results, secondly by testing the explanatory hypotheses. The article concludes by discussing the interplay between hierarchy and CM, in particular how decentralisation - trust in leaders - potentially affects entrepreneurship, and how in turn this can stimulate cooperation and innovation in the municipalities.

The context

Three contextual conditions are of particular importance in understanding the development of CM in the Norwegian municipalities. The first is the topographical context. As of 2020, Norway is divided into 11 county municipalities and 356 local municipalities (reduced from 19 and 428 respectively in 2012). As the country is mountainous with a large number of deep valleys and has a long coastline, carved by deep fiords and numerous scattered islands, municipalities are distinguished by geographical features. Accordingly, they vary in size, from just under 200 inhabitants (Utsira municipality) to more than 690,000 in the capital of Oslo. The average size is just over 15,000 (Oslo included), but the median value is around 5,000. The second factor is the municipality's important function in the welfare state and local democracy. As in the other Nordic countries, Norwegian municipalities play a vital role in delivering many of the important services that characterise the modern welfare state (Baldersheim et al., 2017). Their responsibilities include: renovation and technical services, area regulation, kindergarten and basic education, as well as a comprehensive service portfolio concerning overall primary social and health services (nursing homes, primary medical care, social assistance, child welfare, etc.). A third important factor is that over the last few the Norwegian municipalities have undergone decades. several decentralisations, such as the white paper 'Municipal reform - new tasks for larger municipalities' (Meld. St. 14 [2014-2015]). This reform and others have placed additional pressure on municipalities, including pressure for amalgamation. Some municipalities have used inter-municipal collaboration and networking as a strategy to counterattack mergers. While (with few exceptions) voluntary, there has been a significant increase in the number and types of municipal collaborations (Jacobsen, 2014; Bjørnsen et al., 2015; Baldersheim & Øgård, 2017).

Theoretical Framework

Several authors, including pioneers such as Powell (1991), Goldsmith and Eggers (2004), Koppenjan and Klijn (2004) and others, have made early

contributions to creating clear expectations of the importance of collaboration. Pollitt and Hupe (2011) indicate that collaboration is a positive, or even a "magic concept". Yip et al. (2008:16) describe this phenomenon as "the nexus effect," the basic principle of which is that collaborations "unleash resources beyond an individual organization." A basic assumption is that different types of collaboration add resources to organisations that they do not have solely at their own disposal. Collaboration therefore provides the municipalities with system capacity. The work was subsequently followed by a series of studies categorised as new public governance (NPG) or network management (Osborne & Brown, 2005; Osborne, 2010; Pollitt & Hupe, 2011; Agranoff, 2012; Øgård, 2014; Bovaird & Loeffler, 2016; Ansell & Torfing, 2016; Røisland & Vabo, 2016).

This study adopts the basic assumption found in the literature and policy on collaboration that collaboration adds resources to organisations. However, if we take a closer look at the literature on CMs, there are different focuses in the 'network literature' (Haug, 2009; 2018). The first research focus is the US-inspired *urban regime theory* (Stone, 1989; 2006, cf. Mossberger & Stoker, 2001), which draws attention to who participates. Stone's argument does not focus on power wielded over others (dominance), but rather on the ability to act collectively across institutions (Stone 1989: 229). The argument is later elaborated through the formulations "power over" and "power to" (Stone 2006). Urban regime theory offers a political–economic perspective on collaboration and demonstrates how cooperation between private and public actors can have positive effects on urban and regional development.

A second theoretical path is the UK and continental *policy network perspective*, which focuses specifically on what needs to be done (i.e., it is problem-driven). Policy networks are central to Rhodes' argument (1991; 1999: 2000), who defines them as "a cluster or complex of organizations connected to one another by resource dependencies" (1999: 37). The policy network perspective is further developed by Kickert et al. (1999) by pointing out that networks typically arise as solutions to "wicked social problems" (cf. Koppenjan & Klijn 2004), that is, problems that are difficult to solve within the framework of one organization or jurisdiction (e.g., environmental problems, urban planning, etc.). More recent studies have incorporated the concept of innovation (Klijn & Koppenjan 2016; Ricard et al. 2017), including technological innovation (Haug 2018) and strategic planning (Nederhand et al. 2018).

A final theoretical path in the network literature focuses on the substantially broader concept of *governance*. Originally, the key focus of the literature on governance was how inter-organizational activities are led and managed and particularly how decisions are made. A central part of the literature relates to what was originally described as the "governance problem" (Pierre & Peters 2000:23; Sullivan & Skelcher 2002; Baldersheim et al. 2003). Here, the problem refers to solving tasks through collective action without hierarchical decisionmaking structures, such as those between municipalities. This includes unintended effects such as increased transaction costs, fragmentation, weathering of responsibilities, democratic erosion and dangers of elite formation (Jacobsen 2014). Some authors have referred to this debate through the concepts of "metagovernance" and the "democratic anchorage of governance network," increasing accountability in networks, and the challenges of finding legitimate ways to incorporate democratic influence and control (Fimreite & Medalen 2005; Sørensen 2006; Olsen 2006; O'Leary & Vij 2012; Røisland & Vabo 2016). Studies on collaboration "in the shadow of hierarchy" are relevant to this debate. Importantly, collaboration requires trust; however, trust does not suddenly arise and must be developed over time through repeated interactions and experiences (Axelrod 1984; Lorenz 1991). Recently, Nederhand et al. (2016) identified two versions of the shadow hierarchy, concluding that "distrust leads to a fear-based shadow, whereas trust leads to a more benevolent form" (p. 1078). This creates the expectation that previous collaborative experiences determine the composition of the actors; they develop over time between neighboring municipalities, as discussed by Ricard et al. (2017, p. 10): The longer the distance from potential partners, the weaker the "shadow" and the less cooperation.

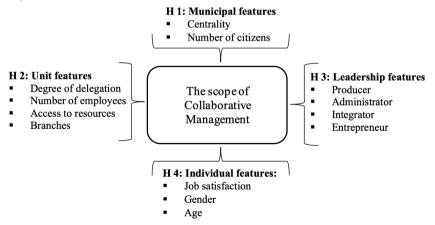
Given the attention these concepts have received, it is important that they are further developed. This, of course, happens continuously. However, as indicated above, there is limited knowledge about municipal sector differences and what explains variation, i.e. why some managers and units are more cooperative than others and vice versa (Ricard et al. 2017; Nederhand et al. 2019). A second challenge is that the intersection between management systems remains understudied; especially the relationship between hierarchy and CMs. Collaborations do not take place in an institutional vacuum (Agranoff 2012). For instance, as argued by Nederhand et al. (2019:1064), although traditional hierarchical steering might be retreating, "governments are still able to control vital resources, and this enables them to use more complex and subtle governance strategies. These go beyond coercive control, creating what has been called a "shadow of hierarchy" (cf. Sørensen 2006; Vabo & Røisland 2016). The present study adds to the current body of knowledge by focusing on municipal departments and middle managers' perspectives. More precisely, does more (or less) delegation of responsibility and authority to the middle managers in the municipalities lead to more or less cooperation across the sectors and territories? By measuring and explaining the scope and types of collaboration in local government in Norway, this study contributes to a better understanding of the drivers at the intersection of hierarchical management and networks, as called for by Ricard et al. (2017) and Nederhand et al. (2018).

What explains variations in Collaboration Management?

The dependent variable in this article is the scope of collaborative management, as reported by the informants. The variable is calculated as an index by the sum of joint projects/collaboration with other units in the municipality, similar units in other municipalities, non-governmental organizations or private industry, or municipalities in other countries, and participation in EU-funded projects (cf. Table 1 and Appendix 1).

However, to be elaborated below, extensive variation is demonstrated in CM both in terms of scope, types and across sectors. Thus, several endogenous and exogenous sources - or "drivers" (Emerson et al. 2012) - influence a municipality's propensity for collaboration; these theoretical sources are identified and divided into a precise research model shown in Fig. 1 and comprise four hypotheses.

Figure 1: Explanatory model for variation in collaboration: Dependent and independent variables



Hypothesis 1: Municipal features

The first hypothesis involves municipal features (i.e., contingency drivers external to the unit). As Agranoff (2012) argues, inter-organizational transactions are situated, that is, they take place in a context that influences how they are understood and carried out (cf. O'Leary & Vii 2012). This notion is supported by Emerson et al. (2012, p.9), who focusing the idea that different contexts reveal various resource situations and, therefore, that "interdependence, or when individuals and organizations are unable to accomplish something on their own, is a broadly recognized precondition for collaborative action." This rational is based on the resource dependency perspective proposed by Oliver (1990; 1991, cf. Zhu 2017, p. 288). As Emerson et al. argue, "in a sense, this is the ultimate consequential incentive" (2012, p.9). Similar reasoning can be found in the network policy literature. This hypothesis is measured by two independent variables, the first of which is *centrality*. The expectation is that physical distance between the areas of collaboration is important (Jacobsen 2014) and that large distances from regional centers motivate collaboration to compensate for peripheral disadvantages. Hence, it is anticipated that the more peripheral a municipal unit is, the more they will seek collaboration. The second explanatory variable is the number of citizens. Municipal size, although contested, is generally promoted as a motivation for small municipalities to establish CM (ibid), particularly for building system capacity and counteracting municipal mergers of small municipalities. A negative correlation is, therefore, expected between municipal size (number of inhabitants) and CMs.

Hypothesis 2: Unit features (departments)

The second hypothesis concerns unit (department or branch) features and includes four factors. The first is the *degree of delegation*, meaning the level of authority and responsibility of the middle managers in the municipality. The traditional municipal management model, with its limited delegation (Baldersheim, 1991), has been challenged by the New Public Management (NPM) from the mid-1990s onwards (Pollitt & Bouckaert 2004; Øgård 2014; Nederhand et al. 2016). The NPM wave emphasized the decentralization of tasks

and the accountability of middle managers through clear authorizations and corresponding demands on "management by objectives," achieving results, and empowering middle managers as leaders. This led middle managers to be granted new and enhanced authorizations, such as in human resource management, finance, and organization. However, there are large variances in the organizational position of middle managers depending on the level of hierarchical authority they were granted (Monkerud et al. 2016; Baldersheim et al. 2021). The scope of assigned authorizations can be seen as an expression of the autonomy of executive units in the municipalities or their "agencification" (Pollitt et al. 2001: 2004, Andersen & Torsteinsen 2017; Rothstein and Varraich 2017). Such developments are highly relevant in understanding the mechanisms that occur "in the shadow of the hierarchy" (Nederhand et al. 2016). Similarly, O'Leary & Vij (2012: 513) claim that "a legal mandate will increase authority and power and, hence, will tend to increase the likelihood of success of a collaboration". Here, it is anticipated that the more responsibility and authority a midlevel manager is afforded, the more they will utilize this responsibility to participate in various forms of collaboration. Second, several studies have indicated that the size of the unit is important (cf. Jacobsen 2014). As with the variable municipality size (hypothesis 1), from a resource dependency perspective, it is expected that small entities face the greatest resource challenges (e.g., maintaining a professional environment, integrity, development capabilities). The key expectation is that *small units will be more eager than* large units to enter into different types of CMs to compensate for scale disadvantages. The third potential unit feature or driver is resources (Emerson et al. 2012). This is measured by data from the survey. The respondents were asked directly about the resource situation in their unit regarding the extent to which the financial resources and budgets are sufficient in relation to the tasks, and whether the employees' education and competence are sufficient in relation to the tasks. Here, necessity is the mother of invention. As Emerson et al. reasons, "the availability of a grant or new funding opportunity may lead to the development of a collaborative initiative" (2012: 9). Therefore, units with poor finances will seek various forms of collaboration to improve their resource situation: the fewer resources they have, the more they will seek collaboration. The final variable involves branches (i.e., the category of work in which a leader operates, such as in a school, kindergarten, or in the health, technical, cultural field). As these are varied policy fields, problem structures, resource dependencies and contingencies vary, and variation between branches is likely. However, as Nederhand et al. (2016:1080) point out, little is known on this subject.

Hypothesis 3: Leadership features

The third explanatory factor discussed in the literature on collaborations is *leadership*. As O'Leary & Vij state (2012, p.516), "collaboration yields significant leadership challenges."

Early studies emphasize the functions of leadership required for collaboration, which are typically success factors or factors that differ from traditional hierarchical management. (e.g., Agranoff & McGuire 2003). This perspective is later highlighted by Agranoff (2012), who identifies governance

and leadership as important for collaboration. As he argues, "coordinated attacks on problems require collaborative management" (Agranoff 2012:1). Here, the important distinction between networking and collaboration is important. Networks are typically defined as "flat," with management serving the functions of activating, mobilizing, framing, and synthesizing (AMFS) (cf. Haug 2009; 2018). These are entirely non-hierarchical undertakings (Agranoff 2012:17). CM, on the other hand, as defined in the introduction, is more broadly oriented. However, a challenge with these studies is that they are mainly concerned with explaining leadership in or of different networks or collaborations. What we are concerned with here is to explain variation in the scope of municipal cooperation at the intermediate level, that is, whether there are clear differences between managers / departments that participate little versus much in CMs. This study emphasizes the need to combine functions and personal leadership characteristics. Here, close attention is paid to the typology of leadership roles developed by Adizes (1980), the creator of what has become known as the "PAIE scheme:" producer, administrator, integrator, and entrepreneur. These four roles fulfil essential functions in relation to collaboration (Haug 2018). In this study, various roles and functions are operational defined through four additive indices (cf. Appendix 1 for details). The expectation is that the individual middle manager's view of leadership explains their decision to participate in various forms of collaboration. Given the high proportion of collaboration and networks emphasized in the literature on innovation (Haug 2014), a particularly positive and strong connection between entrepreneurial *leadership and collaboration propensity is expected.*

Hypothesis 4: Individual features

The final type of explanation frequently discussed in the literature on CM, concerns individual characteristics, because "collaborations are, of course, enacted by individuals" (Huxham & Vangen 2005, p. 84). For example, in asking the U.S. Senior Executive Service about "the skill set for the successful collaborator," (O'Leary & Vij 2012) found that personal characteristics clearly outnumbered strategy and expertise: "The most frequently mentioned personal characteristics were (in order): open minded, patient, change oriented, flexible, unselfish, persistent, diplomatic, honest, trustworthy, respectful, empathetic, goal oriented, decisive, friendly, and sense of humor" (O'Leary & Vij, 2012, p.515). Similarly, in testing the Hambrick and Mason (1984) much cited upper echelons theory. Esteve et al. (2012) found that collaboration was positively affected by the chief executives' educational qualifications and concern for selfdevelopment, yet was negatively affected by their age. In this study, emphasis is placed on three individual explanatory variables. The first is general job satisfaction. This is measured by the leaders' responses to a question in the survey. Job satisfaction, or lack thereof, can have various consequences. Disgruntled leaders may wish to leave an organization to find more meaningful work. At the same time, dissatisfaction may also reduce initiative and the motivation to collaborate. The second variable is gender. Clear expectations regarding this variable is difficult, as few studies have been conducted on gender and CM. Gender is, therefore, also included in this discussion primarily as a control variable. The same is also true of age, which few studies have explored.

However, it has been shown that the desire to participate in "demanding" networks and collaborative constellations decreases with age (Esteve et al. 2012).

Data and Methodology

The article is based on a quantitative comparative design. The data were collected through a survey in the the Administrative Managers in Norwegian Municipalities Project at the Centre for Applied Municipal Research (SAKOM) at the University of Agder, Norway. The purpose of the survey was to map the attitudes, patterns of action, and strategies for dealing with various problems in everyday life among leaders in Norwegian municipalities. The survey investigated middle managers' roles and the extent of their say in different aspects of municipal activity, such as in innovation, efficiency, political governance, and collaboration with the surroundings. The survey was answered by a representative sample of middle managers for a total of 1.354 responses. Responses were received from middle managers in 64 municipalities, based on a cross section. The number of middle managers who have answers to the individual questions varies between 1197 and 1203. The survey was conducted during the period of 2011–2012. Stratified disproportional selection was used in the selection of municipalities, and in the choice of respondents, a strategic pragmatic selection of middle managers was made. Up to 10 middle managers in each municipality per sector were randomly drawn in alphabetical order. The respondents were selected from the municipalities' websites and from staff lists when information was missing. The response rate was 88 %. The outcome variable contained five variables that captured municipal collaboration at the department level (cf. Tables 1 and 2). The variable ranges from 0 points (complete absence of cooperation) to 20 points (full cooperation in all forms). The index confirms the extensive variation in cooperation at the intermediate level in Norwegian municipalities. The average score is 9.99 and the standard deviation is 2.758. The alpha test (Cronbach) was used for internal consistency (reliability) to measure the average correlation between the variables. The coefficients for the index were somewhat low, but satisfactory for the purpose (Cronbachs Alpha .578). As elaborated above, there are several potential explanations as to why some municipal branches collaborate more than others (hypotheses 1-4, cf. fig 1). With the exception of the variables taken directly from the survey (see Appendix 1 for details), the explanatory variables were collected from Norwegian Statistics (SSB) and the Government Data Registration and Information Scheme (KOSTRA)-a national data registration and information system designed to monitor resource use in the county and municipal government. The analyses are presented in two steps: first, the survey results on collaborative management are reported on, including the types, scope, and variations. Next, the factors potentially causing variation in the propensity for CMs are tested by four OLS regressions (Table 4).

This study possesses a few methodological challenges. When extracting respondents, there are two elements that potentially challenge in the data validity. The first is the *definition of a middle manager* when extracting respondents. The second is *misinformation related to the respondent's recipient data*, i.e., the e-mail address. All selections of middle managers are made 48

according to the same principles, and a procedure has been followed for selecting the nearest stated unit manager in each sector. Here there is variation in relation to the title; some are unit leaders, others are department heads or sector leaders. Incorrect information may also occur. However, all information is obtained from the website of the individual municipality, or by direct contact for submission of leader lists. It has not been obvious what other approaches could have been used to counteract these weaknesses. A second challenge is related to causality. The theoretical basis for the analyses is based on «critical realism» (Bhaskar 2008; Danermark et al. 2002). This tradition emphasizes a generative causality where effects are studied as an interaction between causal mechanisms and context. An effect is assumed to be related to a specific triggering cause. But this mechanism does not always and necessarily have to lead to a given result the mechanism may just work under certain circumstances. As pointed out by Van de Ven (2007), generative causality can be studied both through analysis of variance (cross-sectional data) and process analysis (time series data). Since the analyses presented in the article are mostly based on data collected in Norwegian municipalities in a given period of time, it is natural to carry out the analyses as analysis of variance. Variance is analysed partly as differences across municipalities, and partly across organizational units within the municipalities. A third challenge is that the data collection is based on a survey that uses questions that *require self-assessment*. The use of subjective versus objective measurements is highly debated (Andrews et al. 2006). Both measurements have several common methodological biases that can have a potential effect on research results. Self-assessment can have a potential methodological error through what is described as a consistency effect. That is, the respondent tries to appear rational, or what the respondent assumes is rational (Podsakoff and Organ 1986). This occurs especially in surveys where respondents are asked to specify previous behaviours or their attitudes (Podsakoff et al. 2003). Despite this potential effect, it is chosen to carry out a self-assessment. The goal of representativeness, and the assumption that the respondent is the best source of this type of information is given priority.

Finally, the analyses presented are based on *data somewhat back in time* (2011-2012). However, in the intervening years, there have been few major changes in the municipal sector in Norway that involve significant changes in the middle managers' position and tasks. The two reforms that could be assumed to lead to changes, the municipal mergers with effect from 2020 and the new municipal law in force from 2019, have left less traces than the proponents might have imagined. The amalgamation of municipalities in Norway has reduced the number of municipalities by 68, while the municipal structure as such is about the same, with more than half of the municipalities with a population below 5000. Regarding the new Municipal Act, a recent survey showing all mayors and municipal directors the majority of them experience the law as mainly a codification of practices that were introduced in most municipalities long before the law was passed (Baldersheim et al. 2021). In the big picture, the municipalities' tasks, financing, legal basis and organization have changed little since 2010.

Results and Analyses

Question 1: What is the extent of municipal department collaboration?

The first question concerns the scope of collaborative activities in municipalities: To what extent do municipal departments participate in collaboration, and if so, where and with whom? To answer these questions, the middle managers were asked to take a stand on five statements. In line with the definition of collaborative management presented above, each statement focused on "joint projects/collaboration" with different actors. The response options ranged from 1 to 4 (fits very well). The results are shown in Table 1.

Table 1: How well would you say that the statements below fit in as a description of your internal and external collaboration experiences? (Mean score and Std. Deviation. Max score = 4) (N = 1197 - 1203)

			/ \	/	
	My unit has joint projects / collaboration with other units in the municipality	My unit has joint projects / collaboration with similar units in other municipalities	My unit has joint projects / collaboration with non- governmental organizations or private industry	My unit has joint projects / collaboration with municipalities <i>in other</i> <i>countries</i>	My unit participates in <i>EU-funded</i> projects
Mean	3.10	2.21	2.17	1.29	1.23
Std. deviation	.885	1.096	1.049	.700	.709
Ν	1203	1199	1200	1197	1200

The table illustrates rich variation in both the extent and the types of collaborations. As expected from the analysis of governance theory, the importance of territorial distance (i.e., proximity) was evident. The most popular type of collaboration was with other units internally (mean score 3.1). Out of 1,203 responders, 925 said that this fit well or very well (77%). This was expected and is in line with previous findings (e.g., Ricard et al. 2017, p. 10, cf. Jacobsen 2014); at the same time, it illustrates that silo thinking or suboptimality is far from evident in municipalities. Thereafter, there was a marked drop in experience with collaboration. The second most popular collaboration effort was with similar units in other municipalities (i.e., to the one they were leading; mean score 2.21). This calls to mind what Jacobsen (2014) referred to as professional inter-municipal cooperation, whereby municipalities build system capacity through specialized collaboration. This was closely followed by joint projects/collaboration with non-governmental organizations or private industry, corresponding to 35 and 34% (fit well or very well, respectively). This indicated an active external orientation among approximately one in three middle managers' units. These figures support earlier findings, such as the extent of "business councils," as well as "formalised cooperation with the voluntary sector," being established in approximately one-third of municipalities (Haug & Tolgensbakk 2019). The findings could be considered less comprehensive than predicted in the U.S.-inspired urban regime theory (Stone 1989; 2006), but are in line with the criticisms made by Mossberger & Stoker (2001), who argue that the European welfare states have a larger public sector than the liberal U.S. models.

It is difficult to conclude whether the extent of collaboration was high or low. On the one hand, Table 1 illustrates a comprehensive collaborative culture 50

in municipalities, while on the other, approximately two in three middle managers did not collaborate, or only did so to a limited degree. Furthermore, there were clear geographical limitations in external partnership efforts. Joint projects/collaboration with municipalities in other countries and participation in EU-funded projects were limited: only 6–7% of the mid-level leaders indicated that international joint projects/collaboration fit well or very well. The limited participation in EU projects noted could be due to the fact that Norway is not a formal member of the EU. However, this is in accordance with earlier findings in Nordic regions (Baldersheim et al. 2011).

Question 2: Are there variations between the sectors?

What does the extent of collaboration look like when studying the findings according to *municipal divisions*? Are there, as suggested in the policy network literature (see above), observable sector differences? Do we see other patterns of collaboration? Table 2 depicts the same types of collaboration as those presented above, but divided by the largest municipal branches: culture; the technical sector; health services; nursing; care; home care and childcare/child protection; and school, education, and kindergarten. The number of respondents appears in parenthesis in the left column, and the table shows the mean score ranked from high to low by total average score (max score = 4).

7). Main work area	Collaboration with other units in the municipality	Collaboration with similar units in other municipalities	Collaboration with NGOs or private industry	Collaboration with municipalities in other countries	Participates in EU- funded projects	Total average score
Culture $(N = 81)$	3.11	2.69	3.14	1.66	1.65	2.45
Technical sector $(N = 113)$	3.25	2.63	2.32	1.24	1.34	2.15
Health services $(N = 175)^*$	3.37	2.42	2.30	1.23	1.16	2.09
Nursing/home care (N = 234)*	3.09	2.21	2.33	1.21	1.15	2.00
Child Welfare Services (N = 33)**	3.45	2.21	1.85	1.21	1.00	1.95
School, education $(N = 300)$	2.88	2.04	2.14	1.39	1.30	1.95
Kindergartens (N = 235)***	2.98	1.85	1.60	1.21	1.11	1.75
Total****	3.10	2.21	2.17	1.29	1.23	2.00
Ν	1199	1195	1196	1193	1196	1195
Std. deviation	0.885	1.097	1.050	0.701	0.709	0.890

Table 2: Internal and external collaboration experiences. Selection of municipal sectors. Mean score ranked from high to low by total average score (max score = 4).

* The Norwegian municipalities are responsible for both local primary healthcare (nursing homes) and home nursing (district nursing).

** Child Welfare Services ('Barnevernet') concentrate on children who are living under conditions that represent a risk to their health and/or development.

*** 'Barnehage' is the term equivalent to kindergarten (nursing homes), used for children in the ages between 10 months and 6 years. They are today considered part of the education system.

**** Note: the total includes the departments for environmental protection, agriculture, the CEO's staff, and the IT departments. These are left out of the table as a result of low N.

The policy network argument is supported. The table demonstrates the variation between the department branches in terms of collaboration patterns. Middle managers within Child Welfare Services were the most interested in *joint* projects/collaboration with other units in the same municipality. However, as mentioned above, this is the most preferred collaboration activity among all sectors (see Table 1). The cultural and technical sectors were most open to joint projects/collaborations with similar units in other municipalities. The finding that the cultural sector was externally oriented was in line with expectations, as international collaboration is a key factor in the cultural field, in which various friendship community collaborations, cultural houses hosting international concerts, exchanges of musicians, sports events, and tours with choirs and music bands are frequent. School/education and kindergarten were the least frequent collaborators. A similar pattern was evident for collaboration with Non-Governmental Organizations (NGOs) and/or private companies. Here, the distinction between divisions was significant. The cultural sector average was almost twice as high as that of kindergartens, illustrating a cross-border unit (3.14 and 1.60, respectively). When it comes to collaboration with *municipalities* in other countries and EU-funded projects, the cultural sector was once again the most collaborative, while the 'soft' sectors stood out as the least collaborative. In general, substantial variation in collaborative was evident among municipal subdivisions. The sector that collaborated the most across all levels and types was the cultural sector—in other words, this was the most externally oriented group of middle managers.

Collaborative patterns: Locals, Cosmopolitans - or "Glocals"?

Do we see other patterns of collaboration? In relation to the governance perspective, the question arises as to whether the survey results evidenced differences based on different leaders and management? The above patterns of collaboration were further analyzed based on the following diagram. Table 3 combines the internal and external focus on collaboration among middle managers. The "internal partners" variable was constructed based on the sum of collaboration with other units in the municipality and with similar units in other municipalities and was dichotomized based on the median value. The same process was followed for "external partners," which included collaborations with NGOs, private industry, and municipalities in other countries, and participation in EU-funded projects. The percentages were calculated as percentage of the total distribution (N = 1202).

		Internal partners*			
		Low***	High		
External	Low***	(1) Non-collaborative management 36 %	(2) Collegial management 18 %		
partners**	High	(3) Inspirational management 21 %	(4) Open management 25 %		

Table 3 Patterns of collaboration: combinations of internal and external collaboration. Percentages—percent of total distributions. (N = 1202).

* "Internal partners" means partners in other departments inside the respondents' own municipalities, as well as colleagues in the same profession in other municipalities (typically neighboring communities).

**"External partners" means partners outside the respondents' own municipalities (NGOs, business, other countries, EU projects).

***The percentages are calculated as a proportion of the total distribution (N = 1202). The median value is used to distinguish between high and low.

The table identifies four groups of CM patterns. The first pattern (1), noncollaborative management, was the largest group (36%) and included leaders who were involved in neither internal nor external collaboration, or who were only involved to a limited extent. These leaders were disinclined to collaborate with others and operated on their own. The second pattern (2) comprised units that collaborated primarily internally or with similar units in other municipalities, which is referred to here as collegial management (or professional collaboration). This was the smallest group (18%). As shown in Table 2, a large proportion of these units were found in kindergartens, schools, and child welfare departments. The entities in the third management pattern in the lower left corner (3) were not particularly concerned with internal collaboration, yet were active in collaborations outside their municipalities, such as in public-private collaborations, friendships with municipalities in other countries, or participation in EU-funded projects. As external collaboration typically provides learning and access to new ideas, this is referred to as inspirational management (21 %). The last pattern (4) represents the most collaborative in the study (25 %). This group was comprised of about 300 middle managers that collaborated extensively both internally and externally. Inspired by Chesbrough et al. (2006) and others who emphasize open innovation, these were entities whose value exceeded the inherited boundaries between sectors, levels, and countries. This is referred to as open management.

These findings indicate support for the governance perspective and demonstrate the importance of management and leadership. However, it is unclear whether such findings are due to the management system (i.e., the characteristics of the institutions) or the type of leader (including their individual characteristics)? This question is explored in greater depth in the next section; however it is important to emphasize the basic notion that leaders have influence (Northouse 2016:6). It is realistic to assume that different leaders may wish to collaborate to varying degrees (to the extent they are delegated authority that enables collaboration). This can of course be presented in different ways.

However, external relations and collaboration have been emphasized in a number of studies as important for entrepreneurship and innovation (Rogers 2003; Chesbrough et al. 2006). Through external orientation, managers and others will get in touch with and capture new development opportunities.

This observation is exciting, but not new. A rough but important and classic leadership distinction similar to this can be found in Merton's (1949/1957) pioneering work in Rovere (a town of 11,000 inhabitants in the Eastern U.S.) during the Second World War, in which he argues that the two main types of "influential" can be distinguished between at the local level: locals and cosmopolitans. The source of this thinking is Toennies' well-known distinction between Gemeinschaft (localistic) and Gesellschaft (cosmopolitan) (ibid: 393). For the local, the home is "essentially his world," and he "devot[es] little thought or energy to the Great Society." The local is preoccupied with home-grown problems, and is "strictly speaking, parochial," Meanwhile, the cosmopolitan type has some interest in the local community, and "must of course maintain a minimum of relationship within the community since he, too, exerts influence there. But he is also oriented significantly to the world outside." As Merton writes, "if the local type is parochial, the cosmopolitan is ecumenical" (ibid 393). This distinction is important. As Merton elaborates (1949/1956, pages 387-420), understanding how locals and cosmopolitans gain influence in the local community is crucial. Merton takes this a step further and suggests, albeit with a call for more research, that the influence such individuals have on the local community must be considered as an *independent factor*; traditional explanatory factors such as education, income or participation in voluntary associations, etc. is not sufficient to identify the influential people (Merton 1956: 415).

The data shown in Table 3, particularly in terms of the questions posed to middle managers themselves, reflect this distinction between cosmopolitans and locals. The diagonal in the cross table indicates support for Merton's thinking, and the evolution of locals to cosmopolitans constitutes reflects an underlying dimension when reading the data from the upper left to the lower right of Table 3. As is evident in Table 2, the cultural sector appeared to be oriented more toward cosmopolitanism. Merton argues that the cosmopolitan transfers "good taste" from the larger community to the local community and that this "provides a transmission-belt for the diffusion of 'culture' from the outside world to the 'cultural leaders'" (1956:407). This dimension is expected to have an impact on other sectors as well, not least in terms of development and innovation (Ricard et al., 2017). The softer sectors, on the other hand, appeared to be more in line with the local view.

At the same time, when we look more closely at Table 3, an interesting additional point is illustrated. The table shows that the distinction between "Locals" and "Cosmopolitans" is too simple. Based on the characteristics that Merton gives (see above), route two represents a pure group «Locals», route three a pure group «Cosmopolitans». An interesting "new" group is route four, which combines local and cosmopolitan orientation. In other words, we have identified a group that goes beyond the simple division of Merton. This is also the second largest group in the table. The question is what does this group of middle managers really represent?

"Glocals" was a new word in the 1990s in the debate on globalization, which pointed out that successful innovators often stood with one leg in the local and one leg in the global/ international. This is a central argument developed by Manuel Castells (and others) about the importance of internet technology and the emerging 'network society' (1996/2000, cf. Haug 2009; Baldersheim et al. 2011). Perhaps the term «glocalism» captures what we are witnessing through the Norwegian middle management survey: many middle managers are externally oriented - even globally with joint projects / cooperation with municipalities in other countries and participation in EU-funded projects. But they are also locally oriented when the contact patterns are used and new ideas are put into practice. Table 3 shows that there is such a «glocal» group among the middle managers in Norwegian municipalities.

Question 3: What explains variation in collaboration management?

So far in this research, individual outcome variables have been considered and performed variances in collaborative management have been analysed. The subsequent analysis systematically examines variation among middle managers. As presented above, CM is constructed as an additive index. The dependent variable varies from 0 points (complete absence) to 20 points (full collaboration in all forms). Table 4 depicts the results of the analysis. As discussed in the previous section, four key types of explanations (hypotheses) are emphasized. These explanations are operationally defined and were run as analyses in OLS regressions. The regressions were run in four stages (blocks I–IV): I) the municipal features, II) the unit features, III) leadership features (PAIE), and IV) the various individual features. The final analysis explained around 19% of the variation (Adjusted R Square), which was limited. The table shows standardized beta coefficients for each variable. The results of the regression analyses are summarized as follows.

	BLOCK I Municipal features	BLOCK II +Unit features	BLOCK III BLOCK I +Leadership features +Individual fe	
(Constant)				
Centrality (Norwegian statistics, 3 groups)	056	086***	078**	082**
Number of inhabitants (pop log)	015	031	014	006
Degree of delegation (index)		.179***	.141***	.140***
Experienced resource situation		.021	.005	012
Number of employees (unit)		.085***	.070*	.052
Branches (dummy kindergarten/schools)		281***	246***	235***
Branches (dummy health care)	120**	122**	096*
Branches (dummy culture)		.102***	.057	.067
Leader type: Producer (index)			031	033
Leader type: Administrator (index)			066*	054
Leader type: Integrator (index)			.022	.020
Leader type: Entrepreneur (index)			.262***	.260***
Job satisfaction				.092***
Gender (0 = male)				050
Age				057*
Adjusted R Square	.006	.120	.186	.187
Ν	1201	1051	1049	1038

Table 4: Municipal departments' participation in internal and external collaboration. OLS regression: Standardized beta coefficients for the result of endogenous and exogenous explanatory variables. Four block analyzes.

*** Sig. ≤ .001, ** Sig. ≤ .01, * Sig. ≤ .05

Dependent Variable: Collaborative Management: Sum joint projects/collaboration with other units in the municipality, similar units in other municipalities, non-governmental organizations or private industry, or municipalities in other countries, and participation in EU-funded projects. Cronbach's Alpha .578.

Cronbach's Alpha Delegation = .751

Cronbach's Alpha Producer = .543, Administrator = .594, Integrator = .587 and Entrepreneur = .603

Two variables were considered for the first hypothesis that involved **municipal features**. The first variable was *centrality*. Although it was not strong, this variable went some way toward explaining the variation in municipal collaboration (-.082**). The negative correlation indicated that fewer central municipalities were eager to collaborate compared to rural municipalities. This finding was as expected. On the other hand, the *municipal size* did not explain the variation. This was somewhat surprising, as the expected negative correlation between municipal size (i.e., number of inhabitants) and collaborative management was not supported. *All in all, Hypothesis 1 was only partially supported*.

Regarding the second hypothesis that explored unit features, the extent to which the degree of delegation, experienced resource situation in the unit, unit size, and branches (education, health and culture), were able to explain variation in municipal unit collaboration was measured. As shown in Table 4, degree of delegation explained the variation $(.140^{***})$. The tendency was significant and positive: the more delegation was present, the more collaboration was sought. Here, there was an observable connection between the exercise of municipal hierarchy and collaborative management. This supports the expectation that delegated responsibility creates a 'room for maneuver' that middle managers (also) use for collaboration. As described above, the variable is constructed as an index. More detailed analyzes of individual variables in the index show that it is especially the "additional income power of attorney" (the ability to dispose of any surplus on the department's accounts) and the opportunity to conduct "local wage negotiations" that is particularly strong (cf. Appendix 1 and Baldersheim et al. 2021). Both of these types of delegation express confidence in the middle managers in the municipality. Conversely, unit size did not appear to be relevant, though the correlation was positive. On the other hand, the unit types or branches did explain the variation. This confirmed that which was suggested in the descriptive analysis (Table 2). A total of three sectors were tested. By far the strongest effect was the education sector (kindergartens/schools). The coefficient was negative and significant (beta -.235***). The health sector also shows a negative correlation (-.096 *), while the cultural sector shows a positive correlation. This means that an important part of the variation in the municipal units' cooperation efforts can be explained by sector differences. However, the resource hypotheses (experienced resource situation) did not explain the variation. The resource dependency perspective highlighted in both urban regime theory and policy network theory, as measured here, was not a decisive factor in terms of whether municipal intermediaries participated in collaborations. All in all, Hypothesis 2 is supported. Features of the unit explain variation in the scope of municipal middle managers' collaboration.

The hypothesized relationship between leadership types and collaborative management was also supported (H3). However, only one type of leadership correlated positively with collaborative management. As expected, the most important leadership type was entrepreneurship (beta .260***). The main finding is that municipal middle managers who emphasize entrepreneurship (see Appendix 1 for details), at the same time participate in collaboration more than other types of managers. This variable is also constructed as an index. More detailed analyzes of individual variables in the entrepreneurship index show that it is especially the middle managers who emphasize "actively obtaining external funds" and (especially) "that we get to collaborate with voluntary organizations and / or private companies" that have a particularly strong impact (Baldersheim et al. 2021). The finding indicates support for connections between management theory and innovation theories that emphasize collaboration and "open innovation" as important for renewal and development (for example Ricard et al. 2017). The producer type of leadership also showed a negative beta coefficient, albeit not a strong one (-.033), as did the administrative type (the bureaucrat; -.054). In fact, both of these types of leadership were negatively associated with collaborative management. This could be because producer and administrator

types are anxious about losing control of the unit, while the entrepreneur is more willing to take risks and to work in networks and other kinds of collaborative structures. This is in line with research by Ricard et al. (2017), who found that one leadership type —transactional—was negatively correlated with networking (2017, p. 14). The integrator role also did not explain variation in the scope of collaboration; therefore, it is presumed that the integrator is more internally oriented.

In the final hypothesis that involved individual features, the analyses included job satisfaction, age, and gender. However, only job satisfaction explained the variation (beta .092***). The effect was positive and significant. The higher the job satisfaction, the greater the tendency to participate in various collaborations. However, the coefficients were negative for both gender and age. This indicates, as hinted at by Merton (956) and Esteve et al. (2012), that the willingness or ability to collaborate decreases with age. Alternatively, as age is linked to experience, increasing age could make collaboration less relevant. In terms of gender, men were slightly more collaborative than women. However, the correlation was weak, and a more detailed comparison of gender across the five types of collaboration did not reveal a clear pattern.

Considering the model and operational definitions, leadership appeared to be the most important variable explaining variation in municipal collaboration particularly entrepreneurial leadership. The survey results demonstrated that the entrepreneur—more so than other management types—sought out different forms of internal and external collaborative opportunities. At the same time, it requires that the entrepreneur be given a certain amount of room for maneuver or sufficient confidence - that allows for all these activities. And that is exactly what the analysis reveals through the variable delegation. The trend is significant and positive: more delegations make more collaboration probable, a room for maneuver that the entrepreneur in particular seems to be taking advantage of. Given previous findings that leadership is "the most important contributor to self-rated innovation capacity" (Ricard et al. 2017, page 17), the contours of an exciting positive relationship between entrepreneurial leadership, networks and innovation is evident in the municipal sector in Norway.

Limitations and Suggestions for Supplementary Studies

As indicated in the section above, this study represents some challenges that may be the subject of new and supplementary studies. First, the study was based solely on quantitative data. As Ashworth argues (2018, cf. Haug, 2018; Nederhand et al. 2018), qualitative studies of collaborations provide other, and typically richer, in-depth descriptions. Second, limitations also exist regarding the composition of variables in this study. Certain variables are emphasized in the explanations for variation and several other possible drivers are identified (e.g., O'Toole and Vij, 2012). In relation to the results of the present study, additional explanations should be tested for, preferably on other types of collaborations. Third, greater insight and data are required in terms of how municipal delegations are affected by top management. For instance, it is unclear whether collaboration is established based on mid-managers' initiative (i.e., voluntarily), or whether it is the result of mandated collaboration from the municipal apex. Forth, the data collected was limited in time, and addition data on time series are required to test the stability of the findings. A significant dynamic is evident in collaborations (Sullivan and Skelcher 2002; Haug 2018). Finally, as suggested by O'Leary and Vij (2012), multi-level analyses could enrich these insights, as could studying collaboration in international comparative studies.

Conclusion and the Way Forward

Despite these limitations, the findings of this study indicate that we must take the leadership into account when studying collaborative management at the local municipal level. The aim of this study was to chart and explain the patterns of collaboration in the daily operations of local government middle management in Norway. Comprehensive data on the collaboration realities for the entire Norwegian municipal sector were presented for the first time (representative sample of municipalities and administrative branches). Three questions guided the study: To what extent do municipal departments collaborate, variation between the sectors, and what explains variation in such collaboration efforts?

Collaboration was indeed evident among the departments: they were active in a variety of organizational and leadership collaborations yet divided in types and scope. Nearby collaborations were found to be the most common types of collaboration, and the further the physical distance, the less collaborations there were. The most important collaborations were joint projects/collaboration with other units in the municipality. The longer the distance, the less cooperation. About a third collaborate with similar units in other municipalities (professional collaboration), and with NGOs or private industry. Collaborations outside national borders rarely occurred. Furthermore, the study shows the following pattern: Different types of collaboration are highlighted in the literature as positive both for promoting innovation (development) and for building system capacity (operations). However, the extent to which municipalities succeed in this collaborative effort varies, not least between different sectors. Schools and kindergartens collaborate to a lesser extent than, for example, the cultural sector. A distinction was also evident between what Merton describes (1949/1956) as "locals" and the more externally oriented "cosmopolitans". Both groups are identified in this study.

At the same time, the study revealed an interesting *new group of middle managers* - "glocals" - who combine local and cosmopolitan orientation. This thus extends beyond the division developed by Merton. The thinking can perhaps be linked to Granovetter's classic study (1973; 1985) on "the strength of weak ties". However, "glocals" are especially rooted in more modern innovation literature on technology development and the network society, as it was developed by Castells (1996/2000) from the 1990s onwards. An interesting point in this literature is that successful innovators (entrepreneurs) often stand with one leg in the local and one leg in the global / international. External orientation provides access to new ideas, inspiration and learning. At the same time, local interest and collaborations are essential when new ideas are to be tested in the «municipal laboratory» (Baldersheim & Rose 2014). This study shows that there

is such a "glocal" group among the middle managers in Norwegian municipalities.

The variation is further explained by organizational characteristics and management factors. Trust and decentralized governance through power of attorney - delegation - created greater scope for collaborative management. Interestingly, the entrepreneur in particular appeared to be moving into this area. thus enabling greater innovation and development. Regime theory, policy networks, and governance perspectives are all emphasized in political science. though the theories have different focuses in terms of stakeholder, problem, and management perspectives. Agranoff (2012) suggests collaborative management as a holistic, useful concept. However, collaborative management is only part of the picture; the interaction between the hierarchy in the home municipality and collaborative management must also be recognized. Few studies have considered the relationship between hierarchical delegation and the consequences for collaboration. The results of this study suggest that it is difficult to explain variation in collaborative arrangements at the intermediate level in Norwegian municipalities unless consideration is paid to the importance of delegation and entrepreneurial leadership. Decentralized management - trust in the middle management level - stimulates collaboration and innovation.

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Descriptive Statistics							
Variable	Ν	Min.	Max.	Mean	Standard Deviation	Source (ID reference)	Years
Collaboration (index)*	1203	3.00	20.0	9.98	2.75	Survey	2012
Centrality (Norwegian statistics, 3 groups)**	1345	1	3	2.43	.954	Statistics Norway	2012
Number of inhabitants	1345	538	560000	101461	161801	Statistics Norway	2012
Experienced resource situation	1230	1	4	2.21	.928	Survey	2012
Degree of delegation (index)***	1340	1	32	18.06	5.09	Survey	2012
Number of employees (unit)	1055	1	740	55.13	70.45	Survey	2012
Branches (dummy kindergarten/schools)	1345					Survey	2012
Branches (dummy health)	1345					Survey	2012
Branches (dummy culture)	1345					Survey	2012
Leader type: Producer (index)****	1245	3	16	13.15	1.89	Survey	2012
Leader type: Administrator (index)	1245	4	16	11.89	2.07	Survey	2012
Leader type: Integrator (index)	1245	2	24	19.73	2.64	Survey	2012
Leader type: Entrepreneur (index)	1245	3	24	18.11	2.84	Survey	2012
Job satisfaction	1076	1	5	4.33	.770	Survey	2012
Gender (1= male)	1047	1	2	1.68	.468	Survey	2012
Age	1067	28	69	50.85	8.11	Survey	2012

Appendix 1:

*The collaboration variable (dependent variable) is calculated by the sum of joint

projects/collaboration with other units in the municipality, similar units in other municipalities, nongovernmental organizations or private industry, or municipalities in other countries, and participation in EU-funded projects.

**The *centrality* variable is calculated by Statistics Norway based on travel time to workplaces and service functions.

*** *Delegation* include the obligation to cover next year's budget deficit and the opportunities to redeploy gross budget; authorize additional revenue (adjustments on the expenditure side corresponding to additional revenue); transfer (part of) the profits to next year's budget, hire staff, conduct and approve local wage negotiations; conduct internal reorganizations; and specify performance requirements regarding resource use/economy, goal achievement, and working environment, among others (Baldersheim at al. 2021).

**** All *leadership* additive indices are based on response to the question: How do you act as a leader in relation to the employees in order to achieve the unit's goals? All indices showed a satisfactory Cronbach's Alpha. In total, the respondents could rank 22 response alternatives from (1) "completely insignificant," to (4) "of very high importance." The *producer* measures the extent to which employees are provided with opportunities to continue their education, and the leader continuously coordinates the work in a unit by following academic development, ensuring that working methods are updated, listening to users' views, and communicating them to the employees. The *administrator* (or bureaucrat) is defined through four response options: following regulations by the book, employees' understanding that their leader is monitoring, as well as assessing their performance on an ongoing basis, and consciousness of the need to adhere to allocated budgets. The *integrator* includes six response options: individuals' perception of tasks as meaningful and rewarding, praise handed down to employees by the leader in response to positive efforts, employees' knowledge that they have a safe workplace, time off for social gatherings, continuous coordination of work in a unit by the leader, the employees' ability to travel away from work

together to discuss issues in the unit, and cooperation across sector boundaries within the municipality by the unit. As to the final Index, the *entrepreneur*, six response options are included: freedom for employees to choose how their role is to be performed, the following of political signals by the leader and communication of them to employees, active attempts to obtain external funds for the operation of the unit by the leader, cooperation of the unit with non-governmental organizations and/or private companies, new initiatives and measures from individual employees/groups of employees to stimulate and reward, and finally, the opportunity for trial and error for employees.

Notes

¹ The article is based on a chapter in the Norwegian language book "Den kommunale mellomlederen. Selvstendig lagspiller" (The municipal middle manager. Independent team player) published by Fagbokforlaget in 2021 (Baldersheim et al., 2021).