Cooperation is no Panacea: Inter-municipal Cooperation, Service Delivery, and the Optimum Scale of Operation

A Study of how Cooperation Affects Performance in Local Service Delivery

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Summary

Inter-municipal cooperation (IMC) is one of the most widely-used organizational alternatives in local governments' attempts to adapt to ever-increasing demands for high quality and cost-efficient services. Although IMC is widespread, studies of its effects are largely lacking. The existing studies show contradicting results, causing more and more scholars to ask what determines whether or not cooperation is successful. This study contributes to filling this gap by asking, when and how shared service delivery is beneficial.

The study's empirical work is constituted of four separate articles. Each article uses one specific service as an empirical case for analyzing the effects cooperation on one or two distinct dimensions of performance. Together, these studies provide an empirical ground for comparing and discussing how the effects of cooperation may depend on cooperation size and tasks characteristics.

Using a transaction cost framework, I examine whether differences in modes of governance (i.e., cooperation, hierarchy, and market) affect performance in local service delivery. I examine (1) whether differences in the characteristics of services affect performance, i.e., whether different tasks have different levels of feasibility when it comes to being shared with other municipalities. The empirical cases are fire services, emergency primary care, and municipal auditing, where the first two represent tasks with low contractibility and high spatial dependence, and the third represents, by contrast, high contractibility, and low spatial dependence. The latter refers to municipalities financial and performance auditing who is assumed to be more feasible with use of both market and cooperation. I further examine how (2) cooperation in different sectors affects cost efficiency, input, and output quality, testing whether this form of governance promotes some types of performance more than others. Finally, I examine (3) how and to what extent the effect of cooperation depends on its number of members.

The study reveals that cooperation have different effects on different types of performance. The effect of cooperation depends on the size of each cooperation and vary between service areas. Cooperation comes with both costs and benefits; it is advantageous in some settings, but not in others. The present study examines, through four separate empirical studies (articles I-IV), whether the success of shared service delivery is conditioned by different service contexts and organizational settings.

The empirical studies on fire services (article I) and municipal auditing (article IV) examine whether mode of governance affects costs in two service areas that differ largely in complexity, spatial dependency, frequency, and asset specificity. The results support transaction cost claims showing that services with high contractibility (auditing) are most feasible with the market mode when it comes to spending. The results also support the assumption that different tasks have different optimum scales of operation when it comes to number of cooperating members. For auditing services, there are substantial scale economies linked to cooperation (i.e., the more members the better), but never exceeding the market in cost efficiency. The case of fire services, cooperation has a higher optimum number of members when it comes to quality than when it comes to cost. Scale economies are thus more limited than quality gains. The reason for this lies, arguably, in the fire service's low possibility for being subject to centralization.

Points for practitioners include the fact that there is a substantial possibility of exploiting economies of scale in services with high contractibility and a greater possibility of being delivered independently of geographical location; this scale benefit, however, does not exceed the cost efficiency provided by the market. By contrast, the potential for achieving scale economies through cooperation is limited for services that are highly dependent on physical proximity to their users. For these types of services, there is significantly higher potential for exploiting quality benefits of scale, but this depends on where the resources are situated. This is illustrated in the EPC article (III). The more members included in the cooperation, the lower the access to equipment. Conversely, large-scale

cooperation achieves the greatest access to personnel. Scale benefits are easier to achieve when the desired resource already exists in each member municipality, independently of whether the municipality cooperates or not. In the case of EPC, doctors are employed in each municipality and are mandated to participate in the EPC work shift arrangement. An increasing number of members in the cooperation almost automatically increases the pool of resources available to the shared service unit. The mechanisms and effects of cooperation are arguably different when it comes to resources that have to be allocated and prioritized at the inter-municipal level. The present study's findings indicate that having fewer members (or providing the service alone) makes it easier to prioritize and agree on investments. The more partners involved, the more difficult it becomes to carry out efficient collective action.

These findings advance the notion that there is no 'one best way' for designing organizational forms of local service delivery. The effect of cooperation depends on what type of task you share. There is also no 'one size fits all', because the effect of cooperation is highly dependent on the size of cooperation. Finally, cooperation cannot be considered a panacea because it cannot solve all the problems that small (or large) municipalities face in delivering services. Cooperation is not a universal solution for extracting service delivery benefits of scale, but, rather, depends on conditions linked to, at least, the task at hand, the form, and the size of IMC.

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Sammendrag

Kommuner samarbeider i større og større grad med hverandre. En av hovedårsakene til det er for å klare å innfri stadig høyere krav til kvalitativt og kostnadseffektive offentlige tjenester. Dette gjør interkommunalt samarbeid (IKS) til den sterkest voksende organisasjonsformen innenfor lokal forvaltning. Selv om mange har klare forventinger til hva interkommunalt samarbeid skal gi oss av resultater, eksisterer det få studier av hva som er de faktiske *effektene* av å produsere tjenester sammen med andre kommuner. Studiene i denne avhandlingen bidrar til å fylle noe av dette kunnskapshullet ved å undersøke empirisk hvordan bruk av IKS påvirker kommunal tjenesteyting. Studien undersøker hvordan (1) det å inngå i interkommunalt samarbeid versus å tilby tjenester alene eller ved å kjøpe den fra private tilbydere påvirker kvalitet og pengebruk. Den undersøker også om (2) effekten av samarbeid er avhengig av hva slags type oppgave det samarbeides om. Det gjøres ved å studere tjenestetyper som varierer i 'kontraktbarhet' og geografisk avhengighet. Det vil her si analyser av brann, legevakt og revisjonstjenester. Studien undersøker også om (3) effekten av IKS avhenger av hvor mange medlemmer som inngår i samarbeidet.

Resultatene viser at samarbeid ikke er en universalløsning, men kommer med både fordeler og ulemper. Effekten av samarbeid varierer mellom ulike typer kvalitet og kostnader og avhenger av (a) hva det samarbeids om, (b) hvordan samarbeidet er organisert og (c) hvor mange medlemmer det har. Tjenester med lav kontraktbarhet og høy geografisk avhengighet (brannvern) er har lite potensiale for økonomiske stordriftsfordeler knyttet til samarbeid. Her øker samarbeidskostnadene med antall medlemmer. Små samarbeid har en økonomisk fordel av å inngå kontraktsbasert samarbeid fremfor å opprette formelle samarbeidsorganisasjoner. Revisjonstjenesten, som kjennetegnes av høyere kontraktbarhet og lav geografisk avhengighet, har signifikante stordriftsfordeler knyttet til økning i antall medlemmer (jo flere medlemmer jo lavere kostander). Men kommuner som samarbeider klarer, uavhengig av antall medlemmer, ikke å produsere revisjonstjenester til like lave kostnader som det private markedet.

I hvilken grad samarbeidene klarer å hente ut kvalitetsmessige stordriftsfordeler av samarbeid avhenger av hvorvidt ressursene må prioriteres og investeres på

samarbeidsnivå. For bemanningsressurser i legevakt, som eksisterer på kommunalt nivå uavhengig av hvordan tjenesten er organisert, vil en økning i antall medlemmer øke tilgangen til ressursene. Det fører til at de mest medlemsrike legevaktene har størst tilgang til medisinsk personell. Det motsatte er tilfellet for ressurser som må prioriteres og investeres av samtlige medlemmer på samarbeidsnivå. Her gir økning i antall medlemmer lavere prioriteringseffektivitet. Studien peker samlet sett mot at det ikke finnes 'en beste' organisasjonsform eller størrelse for å oppnå god tjenesteyting, men at muligheten for at samarbeid skal være hensiktsmessig avhenger av hva det samarbeides om, form, størrelse og hva kommunene ønsker å få ut av samarbeidet.

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Blåka, S. (2017). "Service Quality, Inter-municipal Cooperation and the Optimum Scale of Operation: The case of local fire departments in Norway. In Trondal J. (ed.). The Rise of Common Political Order Institutions, Public Administration and Transnational Space. Edward Elgar Publishing

Blåka, S., D. I. Jacobsen and T. Morken (2021). "Service quality and the optimum number of members in inter-municipal cooperation. The case of emergency primary care services in Norway." Public Administration: 1-16.

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PART I

1. Introduction

Inter-municipal cooperation (IMC) is a response to increasing demands on municipalities to provide efficient public services and coordination and is described as the most prevalent form of service delivery among local governments in both Europe (Hülst & Van Montfort, 2007b; Swianiewicz & Teles, 2018) and the USA (Aldag, Warner, & Bel, 2020). IMC has supplemented the traditional hierarchy and does, in many areas, prevail the use of contracting to the private market (Homsy & Warner, 2014; Kim & Warner, 2016). The increase in shared service delivery is described as an adaptation to the challenges that small municipalities face in terms of suboptimal provision of local public services (Lage-Penas & Martinez-Vazquez, 2013). IMC aspires to extract scale benefits that materialize as cost savings, increased service quality, and regional coordination (Aldag et al., 2020).

Even though IMC has, for decades, been suggested as a way of dealing with difficulties linked to operating on a small scale (Ostrom, Tiebout, & Warren, 1961), and both scholars and practitioners point to the expected gains from cooperation, the literature acknowledges a gap when it comes to capturing the effects of IMC (Bel & Warner, 2015a; Warner & Hefetz, 2002). There has been (Dollery & Akimov, 2007; Hülst & Van Montfort, 2007b) and still is (Aldag et al., 2020; Teles, 2016) a call for more empirical evidence on the performance of shared local service models. Hülst and Van Montfort (2007a) concludes "that research into the performance of inter-municipal cooperation and into the factors that determine success and failure should be at the top of a future research agenda" (p. 237). Also, more recent reviews in the IMC literature advise scholars to seek new answers to "the challenges of scale and efficiency at the local level.

Particularly the reasons to why these solutions *sometimes* work" (Teles, 2016, p. 2).

Local governments, like many governments in general, are characterized by austerity, and IMC is often used to adapt to budget cutbacks (Bel & Warner, 2015a; Gray & Barford, 2018; Warner, Aldag, & Kim, 2021). The research on IMC's effect on cost is, however, described as scant and contradictory. How and to what extent organizational forms of government affect spending is thus an important question for both practitioners and researchers (Aldag et al., 2020; Bel & Warner, 2015b). Reviews of the literature shows that most studies concerning the effects IMC have focused on cost, using technical services (e.g., solid waste disposal, water supply) as cases (Bel & Sebő, 2021; Bel & Warner, 2015b). The results are described as divergent and inconclusive; some studies show that cooperation reduces costs, while some show that it increases them. Meta-studies of this literature have expressed an explicit need for empirical research on other types of services (Bel & Warner, 2015b). This taps into the assumption that different transaction specific task characteristics may have different feasibility for being subject to production by hierarchy, cooperation or the market (Williamson, 1996).

Research on the performance of cooperative arrangements and the institutional factors that determine performance is described as rare and fragmented (Hülst & Van Montfort, 2007a, p. 211). Studies of the effects of cooperation must go further than the classic comparison of markets, hybrids, and hierarchies (Williamson, 1991). This acknowledgement has also made scholars question more and more explicitly how different levels of integration and size of cooperation may affect performance (Bel & Belerdas-Castro, 2021; Bel & Sebő, 2021; Voorn, van Genugten, & van Thiel, 2019). Cooperation is an attempt to solve problems concerning scale. Cooperation, however, varies greatly when it comes to organizational form and number of members. An important issue requiring further empirical scrutiny is how dispersion of ownership (Sørensen, 2007) and service provision shared by multiple principals (Young, Peng,

Ahlstrom, Bruton, & Jiang, 2008) affect performance (Bel et al., 2022). The present thesis focuses on this issue by investigating the effect that the number of cooperating partners has on service delivery.

The lack of conclusive findings brings about the view that cooperation should not be considered a panacea, and has scholars debating whether studies of the effects of cooperation should more closely consider its specific contexts and conditions of operation. There is also broad agreement among scholars that the literature remains scarce and inconclusive when it comes to cooperation's effects on spending, as well as on dimensions of performance that extend beyond cost savings (Aldag et al., 2020; Bel & Warner, 2015a, 2015b; Hülst & Van Montfort, 2007b; Teles, 2016). Some even argue that cost savings due to cooperation are limited, and that this mode of governance should mainly be considered a tool for achieving better quality and access to services (Aldag et al., 2020). Very few studies focus on how IMC affects service quality. This has led Bel and Sebő (2021), in their review of studies examining the effects of IMC on cost, to conclude that they "have not been able to consider here questions of service quality, given that the empirical evidence is extremely scarce" (p. 27).

Following recent empirical studies, the argument and contribution of the present thesis is that the effects of cooperation may depend on *how you organize it* (see for instance, Bel et al., 2022; Voorn et al., 2019; Voorn, Van Genugten, & Van Thiel, 2017), *what you share* (see for instance, Aldag et al., 2020; Bel & Belerdas-Castro, 2021; Bel, Fageda, & Mur, 2014; Dixon & Elston, 2019) and *what type of gain you want* from shared service delivery (see, for instance, Aldag et al., 2020; Bel & Sebő, 2021; Dollery & Akimov, 2007). The existing gap in the literature is not only unsatisfactory from a researcher's point of view; it also leaves practitioners involved in developing and managing cooperative arrangements empty-handed (Hülst & Van Montfort, 2007a, p. 237).

This thesis contributes to filling the existing gap by asking *when and how shared service delivery is beneficial.* This question leads an investigation of how IMC affects different types of performance in local service delivery. The main questions posed are (1) how does cooperation affect service delivery? More specifically, (2) does the effect

of cooperation depend on what type of service is being shared, and (3) does the effect of cooperation depend on the size of the cooperation, i.e., its number of members?

These questions are examined empirically within Norwegian municipalities. Norway represents a national context characterized by a decentralized administrative tradition that grants municipalities high degrees of local autonomy and a generalist responsibility for providing a variety of public services that differ in complexity (Baldersheim & Rose, 2016; Leknes et al., 2013). The decentralization of service delivery and substantial organizational autonomy makes IMC a widespread organizational form for providing public services in the Nordic countries (Hülst & Van Montfort, 2007b; Leknes et al., 2013). The organizational variety and scope of IMC also make Norway a fruitful context for studying when and how shared service delivery is beneficial.

The papers in this thesis explore the research questions empirically by analyzing service areas that have not yet been explored and that differ largely in their characteristics from previously studied services (as well as from one another), namely, local fire services, emergency primary care, and auditing.

1.1 Scale of local government

Local government is generally considered the oldest and most enduring element in public administration. It represents the democratic institution closest to citizens and is, in many countries, the largest provider of public services (Hülst & Van Montfort, 2007b). The optimal size for local government is a fundamental debate in political science (Dahl & Tufte, 1973; Dixit, 1973) and dates back to ancient Greece. The advantages and disadvantages linked to smaller or larger scale, and the proper size of local authorities has had a central position in both theory and practice of public administration (Baldersheim & Rose, 2010b; Keating, 1995; King & Ma, 2000; Newton, 1982).

A common take on this tension is based on Dahl and Tufte's (1973) modern classic, *Size and Democracy*. Here, the authors argue that smaller political units enhance citizen effectiveness, thus creating better opportunities for democratic participation, while larger political entities offer better system capacity and are thus able to deal more effectively with other challenges, such as achieving economies of scale.

> This presumed trade-off lies at the root of many attempts to reform local government. On the one hand, large units are known to be necessary for the efficient and effective provision of public services. On the other hand, small units are believed to be more conducive to a sense of belonging, a high rate of individual participation, and close contact between political elites, leaders and ordinary citizens. (Røiseland & Vabo, 2019, p. 286)

Dahl and Tufte's simplistic model has been challenged over the years, and more recent publications call for a broader or more nuanced framework that more comprehensively incorporates the modern complexities of democratic legitimacy (Røiseland & Vabo, 2019). 'The boundary-problem is now even more complex, and particularly evident in inter-municipal settings' (Teles, 2016, p 27). We can, to some extent, consider the scale of local government a result of the territorial choices of each nation, where:

> Reformers of public administration are on a perennial quest for a better fit between the scale of problems confronted by governments and the scale of governmental institutions that are responsible for solving those problems. Such a fit, however, can never be a permanent one; societies change and so do the extent and nature of challenges confronting governments" (Baldersheim & Rose, 2010b, p. 1)

Numerous scholars have described the development of societal problems as increasingly global, complex, wicked, trans-border, and boundary-crossing (Peters, 2017). The concept of boundary-crossing problems refers to issues that require coordination across institutions and span from the need for global

governance of, for instance, pollution or pandemics (Egeberg & Trondal, 2018), to local governance of, for instance, controlling forest fires or virus outbreaks (Jacobsen, 2017; Pollock & Steen, 2021). This makes territorial and organizational governance choices an almost inexhaustible source of research questions (Baldersheim & Rose, 2010a), and "the issue of the appropriate scale for local government has regularly appeared on the agenda of public sector reformers" (Mouritzen & Rose, 2009, p. 1). The urge to reform must also be seen in light of the general developments in the public's expectations of local government, which have increased over the past decades and resulted in a larger scale of production of public services. This steady rise in demand has put pressure on western democracies to provide an increasing number of high-quality, low-cost services. The provision of these services has largely been delegated to local governments, thereby increasing pressure on their system capacity (Baldersheim & Rose, 2016). Especially smaller municipalities have been experiencing the incompatibility of their territorial scales of operation with the new demands for technological and economic efficiency in service delivery (Holzer & Fry, 2011; Hülst & Van Montfort, 2007b; Swianiewicz & Teles, 2018; Teles, 2016). An oft-cited example of this is fire services, along with other emergency services, where minimum standards are constantly increasing. In some cases, a municipality's population is simply too small for the municipality, itself, to provide basic services (Hülst & Van Montfort, 2007b, 11).

Accomplishing more with fewer resources is increasingly being considered crucial, and "efficiency and scale concerns are at the core of territorial reforms in Europe" (Teles, 2016, p. 32). The factors with which small-scale local governments struggle can thus be summarized as challenges linked to achieving high service quality and better coordination at low cost (Hülst & Van Montfort, 2007a, 2007b; Jacobsen, forthcoming).

1.2 Strategies for coping with challenges of scale

The most prevalent strategies (reforms) for dealing with challenges of scale can be divided into three categories: *cooperation, amalgamation*, and *competition* (Bel & Warner, 2015b; Hülst & Van Montfort, 2007b).

Amalgamation is a type of reform that has been used broadly both in Europe (Askim, Klausen, Vabo, & Bjurstrøm, 2016; Blom-Hansen, Houlberg, Serritzlew, & Treisman, 2016; De Ceuninck, Reynaert, Steyvers, & Valcke, 2010; Nelson, 1992; Steiner, Kaiser, & Eythórsson, 2016) and worldwide (Dollery & Crase, 2004; Mabuchi, 2001; Rosenfeld & Reese, 2016) to create larger and more robust municipal units (Klausen, Askim, & Vabo, 2016) and thus increase both effectiveness, efficiency and reduce governmental overlap and fragmentation (Rosenfeld & Reese, 2016). These mergers are either compulsory or voluntary, although, in most countries, amalgamation has had a compulsory character (Bel & Warner, 2015b). Contrary to expectations, research shows poor results from this upscaling. Cost savings are mostly limited to central administration (Blom-Hansen, Houlberg, & Serritzlev, 2016), and, in most cases, amalgamations lead either to cost inefficiencies (Bish, 2001; Dollery & Johnson, 2005; Fox & Gurley, 2006; Nakazawa, 2013) or no savings (Allers & Geertsema, 2012; Tavares, 2018). Some studies also observe that increasing steering capacity comes at the expense of various dimensions of political representation (Blom-Hansen, Houlberg, & Serritzlev, 2016; Blom-Hansen, Houlberg, Serritzlew, et al., 2016; Blom-Hansen, Houlberg, & Serritzlew, 2014). A recent review of this literature (Tavares 2018) point to few changes in the quality of local services and supports the classic expectation of trade-off between efficiency and democracy (Antonio F Tavares, 2018). The grim results of the, now extensive, literature on amalgamation have strengthened the call of scholars and practitioners for alternative organizational forms that allow local governments to tackle challenges of (small) scale. A common suggestion is that "possible alternatives to municipal amalgamations which take into account local self-government

aspirations include inter-municipal cooperation agreements and contracting out in the private and non-profit sectors" (Tavares 2018, p. 9).

This brings us to the other policy that addresses problems of scale, namely, privatization—and thus competition—in service delivery. This movement from publicly-produced service delivery to increased use of the market can be placed as a manifestation of New public management reforms (Hefetz & Warner, 2004). However, even though the decision to privatize is motivated mainly by expectations of saving on costs, results from research on the subject are mixed (Bel & Warner, 2015b). Many municipalities, especially small ones, are finding that the transaction cost linked to outsourcing outweighs or even exceeds potential efficiency gains (Bel & Belerdas-Castro, 2021; Bel, Fageda, & Warner, 2010; Bel & Miralles, 2003).

The third alternative to addressing challenges of scale, and the focus of this thesis, is cooperation. This form of governance is often presented as combining the "best of two worlds" (Hülst & Van Montfort, 2007b p 8). Cooperation promises to increase both system capacity (through sharing) and citizen effectiveness (through being small) (Dahl & Tufte, 1973; Sørensen & Torfing, 2016). It thus promises to sidestep some of the difficulties of amalgamation, i.e., the trade-off between cost and democratic quality (Tavares, 2018), the political costs of compulsory mergers (Dollery & Crase, 2004), and the strong politicization surrounding the debate on privatization (Blåka et al., 2013; Kishimoto, Petitjean, & Steinfort, 2017; Lobina, 2017; Mann & Warner, 2019; McDonald, 2016; McDonald & Swyngedouw, 2019).

This makes cooperation an auspicious and widely-adopted option. Summative, cooperation is described as the most prevalent form of service delivery among local governments. It is a common strategy for improving quality and coordination and for saving on costs in public services by extracting benefits of larger scale. It is, however, also a phenomenon that, both conceptually and empirically, can be difficult to grasp (Jacobsen, 2017).

1.3 Governance and performance in public administration

The challenges and developments outlined above are not restricted to the local level but, rather, represent general tendencies in government and society. Over the last three decades, there has been an explosion of interest in the concept of governance among public administration scholars (Bevir, 2011; Kwon, 2016; Levi-Faur, 2012). Numerous studies have documented the changes public government has undergone and the increasingly close (horizontal and vertical) intertwinement of government and other sectors (Kooiman, 1993; Pierre & Peters, 2005; Pierre & Peters, 2020; Røiseland & Vabo, 2008). This transformation can also be observed in the service delivery paradigm, which has enabled researchers to develop and test diverse service delivery mechanisms often characterized by network relations and increased use of the market (Kwon, 2016, p. 1). The most common explanation for this shift lies in the emergence of neoliberal reforms and globalization, which entail a move away from traditional hierarchical forms of organization and the adoption of network forms (Bellamy, 2017). Climate change, economic crises, war, terrorism, migration, and pandemics can all be described as wicked issues that challenge public governance (Egeberg & Trondal, 2018) and our existing territorial structures (Baldersheim & Rose, 2010b) and lead to a stronger need for cross-border problem-solving (Egeberg & Trondal, 2018).

Many administrative reforms have thus been considered counterweights to—and almost attacks against—the hierarchical structure of public administration (Peters & Pierre, 2003). They challenged the traditional perception of hierarchy as an efficient organizational model (March & Simon, 1958) by arguing that hierarchies are rigid and slow, incapable of change, and inefficient. The validity of this critique, along with what the alternatives to hierarchy are and what norms or indicators it is to be evaluated on appears to be a high priority on the agenda of public administration scholarship - and provides an apparently inexhaustible source of research questions (Peters & Pierre, 2003).

To assess the rationale behind this critique, we must understand its historical context:

> In most countries, the public bureaucracy found its organizational form at a time when the primary role of these organizations was the implementation of law. Public service production of the scale we know today did not exist; it is to a very large extent a feature of the latter half of the twentieth century. Hierarchy thus early on became the preferred organizational model as it is an efficient instrument for the implementation of law, a process where values such as uniformity, accountability and predictability are essential (Peters & Pierre, 2003, 6).

As expectations of public service delivery grew over time, so did demands for efficiency, budget cutbacks, and a focus on accomplishing more with fewer public resources. Thus, the structure of the public sector itself became a matter of administrative reform (Peters, 1996).

Peters and Pierre (2003) describe the field of public administration as standing at the interaction of theory and practice (p. 7). Scholars' theoretical debates are expected to have relevance for practitioners, and practitioners are expected to use research for seeing the larger issues underlying their day-to-day practices. Public administration also stands at the intersection of several academic disciplines. Disciplines such as political science, economy, sociology, psychology, and law all help illuminate public sector administration. Economy and management have, however, come to play a dominant role in thinking about public administration reforms and structures because the changes have tended to rely on procedures adapted from the private sector (Peters and Pierre 2003). The rational and intentional approach is central to public administration – with roots in traditions of Weber, Taylor, and Gulick. Organizational form is considered, most of all, a tool for performing tasks and achieving societal goals (Christensen, Lægreid, Roness, & Røvik, 2009). Also, when zooming in on local government, reviews of the literature show that much of the contemporary literature on inter-municipal cooperation has an instrumental focus (Aldag et al., 2020; Teles, 2016; Voorn et

al., 2019). This instrumental perspective poses a counterweight to theoretical traditions that view organizational concepts as "fashion" (Abrahamson, 1996); here, cooperation, along with other popular concepts, may be regarded as an organizational trend. Its function, as such, is to act as a symbol and to achieve legitimacy (Powell & DiMaggio, 2012; Røvik, 2007). An instrumental approach asks, more simply, *does it work*? It asks how problems can be solved and assumes that there is a causal relationship between design and desired objectives. The present thesis adopts public administration scholarship's focus on service provision mechanisms effects on results (see Teles, 2016, p. 87). A prerequisite for being able to establish a relationship between design and desired objectives (results) is, first, to define the design one wishes to examine the effect of. In this case, the design is inter-municipal cooperation.

1.4 What is cooperation between municipalities?

Cooperation is a concept that encompasses a variety of forms both within different theoretical traditions and within the empirical field of local government (Bel & Warner, 2015b; Jacobsen, forthcoming; Teles, 2016). Contemporary literature on the empirical field of IMC uses a variety of theoretical anchors (Teles, 2016). One risk of placing too many different concepts in one large cooperation category (network, collaboration, coordination etc.) is that such conceptualization makes it difficult to clearly describe the phenomenon one is actually studying (Jacobsen, 2017, forthcoming). Another is that it becomes what Pollitt and Hupe (2011) describe as a "magic concept", i.e., a concept with a high degree of abstraction and a strong normative character. Its strong normative character has promoted its popularity among both academics and practitioners. It is difficult to be negative to cooperation.

One useful way of 'un-abstracting' the concept of cooperation is to clarify its specific function. Klijns (2008) much-cited review of the network literature show

that the choice of theoretical tradition often depends on the type of cooperation that is being studied. IMC means, in short, that *two or more municipalities pool resources to solve a common task or challenge* (Bel et al., 2014; Hülst & Van Montfort, 2007b; Jacobsen, 2020). This includes a wide spectrum of tasks that are commonly divided by scholars into two categories; *service delivery* and *policy coordination* (Hülst & Van Montfort, 2007a; Teles, 2016). Policy coordination refers to strategic cooperation, with tasks such as planning and creating policies that span across municipal borders (Jacobsen, Kvelland, Kiland, & Gundersen, 2011; Jacobsen, forthcoming; Teles, 2016). These types of cooperations are often termed policy- and governing networks, and have most commonly been studied within political science and public administration (Klijn, 2008). Here, research often focuses on decision-making, power, and managing horizontal collaborations (Klijn & Koppenjan, 2015). Service delivery cooperation, which is the focal point of the present thesis, involves operational tasks, i.e., "the joint production of public services, where municipalities strive to overcome the limitations or inefficiencies of small-scale local government" (Hülst & Van Montfort, 2007a, 214). Joint service delivery is far more widespread than policy coordination networks (Hülst & Van Montfort, 2007a; Teles, 2016). It is characterized by interorganizational networks for sharing service delivery and is most commonly studied within organizational theory. This shared production has relatively clear tasks, formalized rules for interaction and is considered an organizational form in itself, rather than a loose set of relations among actors (Klijn, 2008, p. 517; O'Toole Jr., 1997). Focus if often set on performance indicators, marketlike incentives and corresponds to the New public management literature in literature on inter-organizational service delivery (Klijn, 2008, 517; Klijn & Koppenjan, 2015).

Shared service delivery is thus a form of cooperation that is more integrated as an interorganizational unit than the networks, collaborations, and coordination that many theories of interorganizational relations describe. These theories often focus on more loosely-formed alliances where goals and outputs are less clear

(Cropper, Ebers, Huxham, & Ring, 2008; Keast, Brown, & Mandell, 2007; Provan et al., 2008).

Even though it comes out as highly formalized when framed by the aforementioned theoretical traditions, shared service delivery should not be considered a single, unitary mode of governance (different from in-house, production, and outsourcing) (Powell, 1990). Differences in the organizational features of IMCs also make these cooperations very different from one another (Hülst & Van Montfort, 2007b; Hülst & Van Montfort, 2012; Teles, 2016). These formal structures within the category of cooperation represent design elements that are assumed capable of being intentionally formed and of increasing the probability of attaining certain goals (Egeberg, 2007; Jacobsen, 2017). Any deliberate design of cooperation into a cooperative arrangement will, by definition, imply the setting of rules - here termed as formalization. The degree of formalization can, however, vary (Jacobsen, 2017, p. 206). Empirically, organizing of IMC are often divided between joint or relational contracting (no new formal organization is created) and creating a new joint inter-municipal organization (Bel et al., 2022; Bel & Warner, 2015b; Hülst & Van Montfort, 2012).

The prevalence of cooperation places it at the top of the researcher agenda for many scholars in the empirical field of local government (Jacobsen, forthcoming; Swianiewicz & Teles, 2018). As Teles (2016) puts it, "one cannot claim to understand contemporary local governance if collaboration isn't on its research agenda" (p. 8). IMC is used widely, in different institutional forms and settings (Hülst, Van Montfort, Haveri, Airaksinen, & Kelly, 2009; Hülst & Van Montfort, 2007b; Hülst & Van Montfort, 2012). Its scope is mapped in various national contexts, showing differences in the total use of IMC. For instance, France, which makes the most comprehensive use of IMC, uses more than thirty percent of the total spending from the municipal sector through cooperative arrangements (Swianiewicz & Teles, 2018). In Norway, approximately five to ten percent of total municipal budgets was spent through IMC (Jacobsen, 2020). Cooperation is

not a new phenomenon; in many countries, it is as old as local government itself. However, the general trend over the last two decades has shown a clear growth in the use of both governance- and service-delivering inter-municipal cooperation (Hülst & Van Montfort, 2007b; Jacobsen, forthcoming; Swianiewicz & Teles, 2018). Cooperation has thus emerged as an important alternative to the traditional hierarchical model and use of the private market. In some service areas, it has outperformed both the hierarchy and the market mode in its scope and stands as the most popular organizational form of service provision (Leknes et al., 2013; Monkerud, Indset, Stokstad, & Klausen, 2016).

Cooperation is viewed as a result of intentional organizational design. It is created deliberately to achieve certain societal goals (Egeberg, 2020). Shared service delivery is mainly aimed at attaining different dimension of enhanced system capacity. A crucial question, then, is whether and to what extent the implemented reform can achieve the desired objectives. In the IMC setting, this question resonates with the scholarly questions that ask whether and under what conditions cooperation enables municipalities to extract scale benefits in their provision of public services.

As previously outlined, the general trend over the last decades has shown the public sector shifting away from bureaucratic hierarchy and towards markets and networks (Bevir, 2011, p. 15). In this thesis, I compare cooperation to the classic form of service provision (bureaucracy) and to the NPM model (use of the market). In doing so, I aim to determine whether cooperation succeeds at achieving some of its intended results compared to the hierarchical and market modes of delivering public services.

1.5 Service delivery through hybrids, markets, and hierarchies

A main question in all administrative reform, and in the organization of the public sector, is what organizational form is the most efficient when it comes to

providing public services and creating public value. One of the theoretical frameworks explicitly aimed at answering these questions is transaction cost theory. One of the basic questions this framework asks is what kind of governance structure should be chosen for different tasks in different environmental settings to optimize performance. Attention is focused on how to accomplish more with fewer public resources, and thus on how the mode of governance may increase or decrease efficiency. Williamson (1975, 1991) divides the structuring of the provision of public services into three modes: market, hierarchy, and hybrid (cooperative) forms of governance. The present study focuses on the effects of the hybrid mode versus the hierarchy and market modes. These three can be sorted by their degree of integration of production. Hierarchy can be defined as an organizational structure in which every entity in the organization is subordinate to another entity, creating an unbroken chain of command. All production is, here, integrated in the organization. On the other end, there is the market, which is popularly described as a platform "where buyers and sellers can meet to facilitate the exchange or transaction of goods or services" (Kenton, 2021). The production of the service is separate from its provision. Production thus happens outside the organization, indicating low integration. In the middle, there is the hybrid mode, which refers to a situation in which the organization produces a good or service together with other organizations. Powell, in his oft-cited 1991 article, argues that Williamson's work "took seriously the notion that organizational form matters a great deal, and in doing so, moved the economics of organizations much closer to the fields of law, organization theory and business theory" (p. 296). Williamson's take on the hybrid mode of governance has been subject to discussion and criticism for failing to conceptualize hybrids sufficient enough to be treated as its own (network) mode of governance (O'Toole Jr, 1997). The increasing number of publications since then concerning hybrids, networks, clusters, etc., have not necessarily clarified the matter (Ménard, 2009, p. 87). This thesis builds on the premise that there has to be a demarcation consisting of substantial operational differences to make theory a sufficient tool for empirical studies (Powell, 1990).

As argued by Powell, and as attempted in this thesis, the conceptualization of the hybrid (or cooperation) mode builds on organizational perspectives. The aim is to use the theoretical framework as a tool for better conceptualizing and generalizing the empirical phenomenon.

1.6 Different forms of cooperation

Even though the hybrid is presented, analytically, as one unitary mode between hierarchy and market (Williamson, 1991), it can be viewed as a main mode that varies in its degree of integration. In interorganizational relations, there is a common divide between cooperation as (1) agreements between organizations (no new organization is created) and (2) the creation of a new formal organization at the interorganizational level (Sandfort & Milward, 2008). These categories for structuring interorganizational relations are also applied in Bel et al.'s (2022) division between institutional forms of cooperation in European countries. The first one, *joint contracting*, refers to contractual agreements to shared service production, i.e., joint production without the creation of a new organization. In most cases, this manifests as a buyer-seller situation between municipalities or a relational contract where the 'making' of the specific service is delegated to one member (Bel et al., 2022). Joint contracting aspires to the extraction of scale benefits of cooperation without the cost of creating and running a joint organization. The downside of this form is that contracts are inevitably imperfect and can never cover all situations (Grossman & Hart, 1986). Changing circumstances or needs may lead to perennial rewrites and haggling, thereby impairing performance (Bel et al., 2022; Cunha Marques & Berg, 2011). The second form, *joint organization*, refers, in general, to the creation of an autonomous organization with joint ownership (Dancin, Reid, & Ring, 2008). Service is provided through the joint organization, which has its own management and employees, and where control is exerted by ownership. It can be characterized by being its own legal entity, controlling its own resources, and having its own employees and own set of rules (Jacobsen et al., 2011; Jacobsen,

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forthcoming). From the perspectives of both agency (Fama & Jensen, 1983) and transaction costs (Williamson, 1985, 1991), the puzzle is determining whether these different organizational adaptations affect performance. Do joint organizations raise costs because they duplicate functions that already exists in their member organizations? Do contractual agreements raise costs because they are more exposed to asymmetrical information and the possible cost of constant renegotiation? Comparative studies of how these different forms of cooperation design affect shared service provision are lacking (Bel & Sebő, 2021; Hülst & Van Montfort, 2007b).

This thesis empirically examines the effects of cooperation versus hierarchy and market, along with the effects of different forms of cooperation. The actual *effects* of cooperation, then, require further elaboration.

1.7 The effects of cooperation

It is assumed that cooperation is created with the intention of solving specific problems or achieving specific goals; it is a mean to an end. But this does not mean that all goals are clear or that all effects are planned (Jacobsen, forthcoming). This points to the classic problem of the unintended consequences of social action (Merton, 1936). The *intended effects* of shared service delivery are often summed up by the three aforementioned factors: quality, cost, and coordination. Shared service delivery is driven by the expectation of creating these effects through the extraction of benefits of scale (Aldag & Warner, 2018; Holzer & Fry, 2011; Warner & Hefetz, 2002). The most frequently discussed and empirically scrutinized benefits are economies of scale (Bel & Sebő, 2021; Bel & Warner, 2015b; Hirsch, 1959). Cooperation is an adaptation to the previously described challenges related to returns on scale and sub-optimal jurisdiction or population size in service delivery (Lage-Penas & Martinez-Vazquez, 2013). One of the core tasks of the public sector is to allocate and redistribute resources on the behalf of citizens (Lasswell, 2018; Weber, 1978). An important point to

consider when studying public administration is how to organize public institutions to generate the most efficient uses of these public resources. A common expectation here is that an increase in system capacity creates an increase in efficiency (Dahl & Tufte, 1973). As described in article I, in the present thesis the general argument is that small production, which is closely related to small size, may lead to spare capacity and thus to higher unit costs. Larger production units may exploit their capacity better than smaller units (Council of Europe, 1995). This would lower production costs for municipalities that create joint service provision (Brown & Potoski, 2003). In this sense, economies of scale are closely linked to cost efficiency, since the average production cost per unit decreases as production increases (Bel & Warner, 2015b; Douma & Schreuder, 2008; Feiock, 2007). Many of the same mechanisms may also equip larger units to exploit quality benefits of scale (Jacobsen, forthcoming). Municipalities may use budgetary savings from economies of scale to buy better service quality. They may also achieve both lower cost and higher quality. Larger units may use their economic capacity to invest in better services, such as specialized equipment. A larger scale can also enhance quality by, for instance, increasing ability to attract professional staff and thus creating more specialized milieus (Jacobsen, 2017).

While the intended effects of cooperation are centered on benefits of scale, the literature shows that cooperation also comes with *unintended effects.* In spite of the reformers' expectations that cooperation represents 'the best of both worlds', where municipalities are able to increase system capacity and thus extract economies of scale whilst maintaining citizen effectiveness in small-scale local democracies, a considerable amount of literature shows that these solutions challenge citizen effectiveness by "harnessing the democratic control of the involved municipalities" (Teles, 2016, 3). Scholars have discussed and analyzed the implications of cooperation for democracy, naming consequences such as loss of information, political control, etc., and asking how these networks can be made democratic (Sørensen & Torfing, 2009). More recent reviews (Jacobsen,

forthcoming) of this literature show that cooperation in many cases inhibits political steering and diminishes the possibility of holding democratic representatives accountable both in the context of local government (Blåka & Winsvold, 2013) and in general (Goldsmith & Eggers, 2005). Cooperation has also been shown to increase fragmentation, indicating that responsibility is spread out and therefore withers (Bevir, 2010; Cohen & Rogers, 1992; Sørensen & Torfing, 2016), and may hollow out the municipal organization (Jacobsen, 2015; Rhodes, 1996). The overall picture painted by the literature is that cooperation comes with a democratic downside (Teles, 2016).

The aim in this thesis is not to further examine the effects of cooperation on democracy. Rather, the thesis is focused on cooperation's ability to create system capacity by creating scale economies. It asks under what conditions, if any, cooperation has its expected positive operative effects.

Recent literature also show that cooperation may have unintended downsides when it comes to operative effects on service delivery (Bel & Sebő, 2021; Bel & Warner, 2015b; Jacobsen, Forthcoming; Voorn et al., 2019). It can result in various coordination problems (Brown & Potoski, 2003; Lowery, 2000) and decrease municipalities' ability to prioritize the services (Jacobsen, forthcoming; Oates, 1972, 1999; Tavares & Feiock, 2018). Cooperation may also lead to an increase in transaction costs, which can be defined as the "comparative costs of planning, adapting and monitoring task completion under alternative governance structures" (Williamson, 1996, p. 142). Cooperation constitutes various forms of "collective action" (Feiock, 2007, 2013) that can generate costs related to information sharing and negotiation and hinder efficient decision making, which single organizations are less exposed to (Bel & Sebő, 2021; Bel & Warner, 2015b). The creation and operation of political interaction in new interlocal arenas are, in some studies, stated as costly (Tavares & Camöes, 2007). In considering these downsides or unintended effects of cooperation, the matter of what conditions may lead such costs to exceed the benefits of cooperation emerges.

1.8 What determines whether cooperation works?

The ambiguity surrounding the effects of cooperation challenges the perception many reformers seem to have of cooperation as "the best of two worlds" (Hülst and Van Montfort 2009b) and a universal ("magic") (Pollitt and Hupe 2011) solution to problems linked to scale. Some researchers argue that "it seems undeniable that the benefits of shared services have been oversold in the recent years; and highly likely that, in some cases, investment of time, attention and finance required for collaboration might have been better spent elsewhere" (Dixon & Elston, 2019, p. 34). This drives contemporary research to further question what determines the effects of cooperation and to advise scholars to seek new answers regarding the conditions under which cooperation succeeds (Teles, 2016). It coincides with the critical reflections arising in the field that state that cooperation should not be considered a panacea but may be dependent on other conditions that have not yet been properly identified (Aldag et al., 2020; Dixon & Elston, 2019; Steen, Teles, & Torsteinsen, 2017).

The question of conditions can be situated in the more general scientific debate on defining the scope conditions of a general theory. Even though political scientists largely agree that causal mechanism are crucial to understanding causation, an important issue that researchers must address is how general specific empirical results may apply (Falleti & Lynch, 2009). This reflects the emphasis many scholars have placed on the need to adapt the phenomenon of interest to the context in which it is observed (Adcock & Collier, 2001; Goertz, 1994; Locke & Thelen, 1995).

This thesis attempts to answer calls for more empirical work to test and nuance some of the arguments regarding the advantages of cooperation (Teles, 2016). It advocates a need to take into considerations conditional effects, i.e., under what conditions cooperation is advantageous. This is connected to defining the scope conditions, which, in this case, raises the question as to what degree the effects of

cooperation should be considered general effects and to what degree they are dependent on other contextual factors. The conditional factors analyzed empirically in this study are cooperation size and characteristics of the task at hand.

1.9 It depends on the size: number of members and the multiple principal problem

Cooperation has, in empirical studies, mainly been treated as a dichotomous category, i.e., as differing from market and hierarchy (Bel & Sebő, 2021). Even though this dichotomy represents core categories in studies of public administration, numerous mappings show that the cooperation mode differs largely when it comes to factors such as its number of members, people jointly affected, and geographical jurisdiction (Hülst & Van Montfort, 2007b; Hülst & Van Montfort, 2012; Hülst & Van Montfort, 2007a; Leknes et al., 2013). This section argues that, given that the motivation for creating shared service provision is to increase production volume in order to obtain scale benefits, research should not only analyze the effects of cooperation or not but incorporate the dimension of size and the number of members in the interorganizational unit.

Larger size here implies more municipalities. In practice, this leads to a situation where the service-providing unit must relate to not one, but several, owners or principals. This challenge creates the basis within the fraction of the principal-agent framework (Fama & Jensen, 1983), which focuses on the principal-principal perspective (Waterman & Meier, 1998; Young et al., 2008). Shared service delivery assumes the inclusion of at least two owner municipalities (principals). Following the multiple principal perspective, Voorn et al. (2019) show that inclusion of several principals may impair performance. Reasons for this may lie in coordination problems and weaker incentives for both agents (Bernheim & Whinston, 1986; Dixit, 2002; Stole, 1997) and principals (Schillemans & Bovens, 2011; Young, Peng, Ahlstrom, & Bruton, 2002).

Multiple principals may thus raise agency costs and bring a larger wealth transfer from principals than would occur under one principal (Voorn, van Genugten et al., 2019, p. 678).

Another possible problem of having multiple principals is that it might lower the overall ability to prioritize services (Jacobsen, forthcoming). A fundamental argument for decentralizing responsibility for services and tasks to local government is that decision-making enacted close to citizens will result in higher adaptation to local preferences and overall prioritization of services (Oates, 1972, 1999). The composition of the total service offer in a municipality is adapted to optimize the preferences of the municipality's population. One municipality may decide to grant certain services higher priority than neighboring municipalities would because its inhabitants have a strong preference for these services. This calls for a political body that can allocate resources and prioritize services efficiently. When a task is transferred from a single municipality to several, the ability to efficiently prioritize the quantity and quality of the service is, arguably, impaired. The decisions that spring from each political body at the municipal level must, in the case of IMC, also be negotiated at the inter-municipal level (Jacobsen, forthcoming). The decision, thus, must go through two sets of negotiations, increasing both the number of actors and the possibility that one partner will use its vetoing power to prevent further investment in the service. This can be a challenge to both establishing an IMC and agreeing on further prioritization of investments and quality development. This reasoning applies especially in the IMC context, because all members must reach consensus and all members, in principle, have the opportunity to withdraw from the cooperation. Investments must be accepted by all member municipalities. It may be asked, here, whether cooperation decreases the priority of the service provision so that is adapted to the preferences of the principal with the lowest prioritization of the service. Higher prioritization of the service would then force other members to pay for the investment both for themselves and for the members that do not want

to make the investment. Thus, the more members, the lower the allocative efficiency.

The conceptual question here is how the number of members in cooperation affects the cost and quality of service delivery. This thesis attempts to establish new empirical ground to the questions of if, and at what point, multiple principal problems exceed the potential scale benefits from cooperation.

The next question lies in the possible effects of differences in service-specific contexts. Bel and Belerdas-Castro (2021) point out that "the potential effects of cooperation likely differ across services, because the optimal scale is different for each one" (p. 5). Scholars ask whether the 'optimum scale of operation' differs between services (Hülst et al., 2009) based on seminal works on how the appropriate scale may depend on the good considered (Ostrom, 1976). Do the optimum mode and size of governance depend on the characteristics of tasks?

1.10 It depends on what you share: differences in task characteristics

More and more scholars are asking whether the divergence in performance outlined above may come as a result of differences linked to the types of tasks on which municipalities cooperate (Bel & Belerdas-Castro, 2021; Dixon & Elston, 2019; Swianiewicz & Teles, 2018). As Aldag et al. (2021) put it, "it depends on what you share". Some service areas might be more compatible with the cooperation form of governance than others.

Within the transaction cost framework, a basic focus is set on the contractibility of a task (Williamson, 1985, 1991, 1999). When is it better to outsource a service and when is it better to perform it within the organization? Whether or not cooperation is able to realize economies of scale may thus depend on the characteristics of the tasks on which municipalities are cooperating. This is a matter of great importance for scholars and practitioners. As Brown and Potoski (2005) put it: "An important decision confronting public managers is choosing when to contract for service delivery" (p. 326). Initially, this framework suggests

that a service transaction specific characteristic influences the chances of contract success. Certain characteristics are compatible with low integration, which means that it has high contractability. Conversely, services with low contractability are feasible with high integration of production.

The present thesis thus seeks to determine whether tasks with different characteristics are affected differently by cooperation, and whether it is easier to extract scale benefits from some services more than others. Reviews of the literature show that most studies on the effects IMC have focused on cost, using technical services (e.g., solid waste disposal, water supply) as cases (Bel & Sebő, 2021; Bel & Warner, 2015b). The articles constituting this thesis empirically analyze local fire services, emergency primary care, and auditing. These are service areas in which cooperation is widespread, effects have not yet been properly explored, and task characteristics differ largely from those associated with previously studied services.

The transaction-specific characteristics often used to determine the feasibility of tasks within different organizational modes are *asset specificity*, *frequency*, *complexity*, *geographical dependence*, and *uncertainty* (see, for instance, Brown & Potoski, 2003; Brown & Potoski, 2005; Bel and Belerdas-Castro, 2021). Emergency services and auditing differ in these characteristics not only from previously studied service areas, but also from one another. Emergency services refers to fire services and emergency primary health care. Auditing refers to the obligation municipalities have to make auditors provide financial assessment of annual accounts and conduct systematic assessments of municipalities productivity and goal achievements based on laws, regulation and political decisions. The transaction specific task characteristics, service areas, and assumed organizational fit are summarized in table 1.

Table 1. Task characteristics, services, and assumed organizational feasibility.

Task characteristic	Description	Services that score high	Service types that score low	Assumed organizational fit with high score	Assumed organizational fit with low score
Uncertainty (need for redundancy)	Uncertainty refers to a service's fluctuation in demand. Some tasks, such as emergency care, require fail-safe service delivery and will, therefore, have to provide redundant capacity on a regular basis. Auditing, by contrast, has a low need for redundancy. The higher the need for excess capacity, the greater the expected possibility of gaining scale benefits from cooperation.	Emergency services	Administrative services	Cooperation	Market
Geographical dependency	This indicates the geographical dependence between service and user. A low score indicates greater possibilities for centralization. Therefore, low spatial dependence may facilitate the use of the market and potential scale benefits linked to cooperation. High dependence does not create the same expected possibilities for extracting scale benefits or utilizing market mechanisms.	Home-based care; emergency services	Accounting; auditing	Hierarchy	Market; cooperation
Frequency	Frequency refers to how often the service is used or must be offered. The higher the frequency, the greater the incentive to integrate production.	Waste collection; emergency services	Auditing	Hierarchy	Market; cooperation
Complexity (ease of measurement)	Complexity refers to a task's ease of measurement. Here, it can be argued that it is more difficult to measure and contract, for instance, one unit of fire prevention or emergency care service than one unit of audit service. Low contractibility makes in-house production feasible.	Emergency services; health care	Auditing; waste collection	Hierarchy	Market; cooperation
Asset specificity	Asset specificity emphasizes the degree to which investments can be exploited beyond the specific service field. The lower the possibility for exploitation beyond the specific service, the higher the incentive to cooperate by sharing investment costs, and the higher the likelihood of monopoly markets. Cooperation will, here, arguably be more feasible than both the market and hierarchy.	Emergency services	Auditing; accounting	Cooperation	Market; hierarchy

Source: Compilation based on article IV.

Emergency services are characterized by *uncertainty*, and, therefore, by a need for having on-call personnel independently of whether or not an emergency occurs. The service unit can, to a very limited extent, foresee the amount of work in advance (Warner, 2011). This is a characteristic that is assumed difficult to contract, although scale benefits can be expected from the sharing of the service. Tasks with high need for redundancy may, however, not be suitable for sharing if the service is also characterized by high *geographical dependence*. In the municipal context, a characteristic that is typically expected to enable scale economies is a service's potential for centralization (Dixon & Elston, 2019). Administrative services such as auditing and accounting, which have little dependence on geographical proximity to inhabitants, are assumed more likely to extract cost efficiency from both cooperation and privatization than services such as home-based care and emergency response, which are dependent on their proximity to people (Jacobsen, forthcoming). Tasks that are *frequently* performed by the organization are feasible with integration; the less one uses a specific skill or specific equipment, the more cost efficient it is to share or simply to buy what is needed when it is needed. *Asset specificity* refers to the extent to which these assets can be used beyond the service in question. For example, fire services can be characterized with high score on asset specificity because it is hard to utilize equipment such as fire trucks in other services. The cost of investments also makes privatization less feasible because one risks low degrees of competition or monopoly markets. Sharing would, presumably, be most feasible here, because it opts for scale benefits linked to more members utilizing the assets and avoids market failure (Williamson, 1991). Brown and Potoski (2005) have found that "the costs of negotiating, implementing, monitoring, and enforcing contracts are higher when services have outcomes that are difficult to measure" (p. 327). This is a matter of a task's degree of *complexity*: The easier a service features are to gauge, the more feasible it is to be subject to outsourcing or co-production.

The overall assumption derived from the transaction cost perspective is that emergency services inhabit more characteristics that makes them less feasible

than auditing when it comes to cooperation; auditing is a task that, arguably, fits lower-integrated organizational forms, i.e., cooperation and outsourcing to the private market. The question that the collection of articles jointly tries to empirically scrutinize is whether the effect of mode of governance and size of cooperation differ among services with different characteristics. In doing so, the papers aim to establish new empirical ground for determining the conditions (if any) under which co-producing services is optimal. The final matter on which this thesis attempts to shed light is on what types of performance (if any) shared service delivery is optimal. Does the effect of cooperation depend on what type of goal that is being measured? The present thesis aims to broaden the field of research on IMC by empirically analyzing how cooperation affects broader measures of performance in addition to cost. These performance dimensions are framed as input and output quality (Kelly & Swindell, 2002; Rowley, 1998). The argument and contribution is that the effects of cooperation should not be considered uniform, but, rather, seen as varying among types of performance.

1.11 Differences in performance characteristics: inputs, outputs and cost

Public organizations are seen as having been intentionally designed to achieve a set of goals or solve specific societal problems (Egeberg, 2020). These goals may, however, differ widely. They may even stand in opposition to one another (Benington & Moore, 2011).

Shared service delivery is often described as a 'middle way' strategy to pool resources and thus enhance performance without going through full mergers (Dixon & Elston, 2019). Baldersheim and Rose (2010) describe this mode as 'trans-scaling' rather than 'up-scaling'. Cooperation is thereby used as a tool for creating scale benefits, which means that the larger the co-production unit is, the more resources it can allocate to, which it can use either for lowering costs while maintaining quality or for increasing quality while maintaining costs (Jacobsen,

forthcoming). At least this is what many reformers assume. Researchers describe the effect of cooperation more as an open landscape in which a multitude of different research questions require empirical examination (Teles, 2016, Aldag et. al 2020). Even though the goals of shared service production are broad and dependent on the specific service context, the literature remains scarce when it comes to measuring the effects of cooperation using performance measurements other than cost (Bel & Sebő, 2021). Aldag et al. (2020) conclude that broader benefits, such as different forms of service quality, may in some cases be more important than cost savings, but there is a lack of empirical research identifying these benefits (p. 286). Researchers discuss whether potential cost savings are used to buy better quality (Jacobsen, forthcoming), but also whether cooperation may make some aspects of public value poorer. Even though cooperation may improve some performance indicators, it may impair others (Aldag et al., 2020; Bel & Sebő, 2021; Bel & Warner, 2015b).

From a productivity perspective, this increase in quality can mean an investment in production factors such as equipment, competence, and labor (Williamson, 1985). These factors have traditionally been used as performance measurements and defined as a form of *input quality* (Kelly & Swindell, 2002; Rowley, 1998) indicating "what efforts the organization puts into the production". As outlined in Article III, reaching a certain level of production is especially important for tasks characterized by asset specificity and a need for redundancy (see, also, Williamson, 1979, 1991, 1999). The question then becomes whether shared service delivery manages to increase its access to these inputs, which often means increasing capital and human resources. This expectation of scale benefits is common, but it is being challenged by the expanding literature showing the unintended consequences of cooperation. The question that the empirical studies constituting this thesis examine is whether and how cooperation affects input quality when cost and other relevant factors are held constant. Are municipalities able to extract scale benefits from cooperation?

Output quality, on the other hand, refers to the features of the unit of service that is being produced (Kelly & Swindell, 2002). This type of quality is a more direct measure of what one wants to get out of the service. It points to elements that the policy program defines as indicators of good results, for instance, how long it takes to extinguish a fire or the rate of fire inspections or chimney sweeping. The input is, here, held constant, and the focus is on the output. Public institutions deal with transboundary problems. Cooperation is an organizational form that promises a greater possibility of adapting jurisdiction to the actual tasks and challenges at hand. Many problems such as fires cross borders, subjecting services like fire protection to discussions about jurisdiction and cooperation or lack thereof (Hülst & Van Montfort, 2007b). This study examines whether cooperation among multiple jurisdictions provides better adaptation to realizing optimal quality, measured in outputs that affect citizens and society.

When it comes to multiple measures of performance, the literature is scarce and theory does not provide a uniform suggestion. This does not allow for clear assumptions but, rather, raises some questions. These questions, in examining some of the core operative goals of shared service delivery, i.e., increasing quality and decreasing cost (Bel & Sebő, 2021; Bel & Warner, 2014, 2015b), attempt to untangle the growing scholarly assumption that cooperation is too complex a phenomenon to have one uniform effect.

1.12 Research question: when and how is shared service delivery beneficial?

The arguments outlined earlier build on an overall assumption that cooperation cannot be considered a panacea. It may be successful in some cases and not in others. The main aim of the present thesis is to show that the effects of cooperation depend on organizational and contextual conditions. This is a response to the rising acknowledgement in the literature that not enough is

known about how cooperation between local governments works to be able to design better governance. It is necessary to know what the effects of cooperation are in order to know whether IMC should be encouraged (Teles, 2016). Thus, this thesis aims not only to contribute its findings to the field of research, but also to provide useful information for policymakers and practitioners in local government.

The thesis is broken down into four articles that, in sum, investigate how cooperation, compared to market or hierarchy, affects cost or service quality, and how this effect depends on the organizational form and the size of cooperation. It takes on an organizational approach (Egeberg, 2004), which here focuses on how organizational and transaction- specific contexts (Williamson, 1991, 1996) affect performance. Thus, it is mainly attentive to how formal elements of organizations, that is, the formal structures "that are deliberatively constructed to obtain wanted effects or to fulfill objectives" (Jacobsen, 2017, p. 199), affects these objectives. The thesis identifies several objectives, framed as cost efficiency, input quality, and output quality, and empirically analyzes how organizational form affects these different performance goals of cooperation.

In addition to examining how cooperation affects different types of performance compared to hierarchy and market, the thesis examines how and to what extent the effects of cooperation depend on (1) the type of task being shared and (2) the size of cooperation.

Table 2 outlines the dependent and independent variables and service area in each of the thesis's four empirical studies. The empirical study analyzes fire services, emergency primary care, and municipal auditing, which represent the variations on tasks characteristics, described in section 1.10.

Table 2. Overview of variables and service area in each article.

Article	Independent variables: Mode, organizational form, and size of cooperation	Dependent variables: Performance	Service area
I	• Cooperation versus hierarchy • Joint contracting versus joint organization • Number of members in cooperation	Cost	Fire
II	• Cooperation versus hierarchy • Number of members in cooperation	Output quality	Fire
III	• Cooperation versus hierarchy • Number of members in cooperation	Input quality	Emergency primary care
IV	• Cooperation versus market • Number of members in cooperation	Cost	Auditing

Previous reviews of the literature on task-specific variables describe these as difficult to measure consistently and in an integrative way (Shelanski & Klein, 1995). This is also the case in the present thesis, and the possible effects of differences in task characteristics are analyzed indirectly, i.e., as the sum of four separate studies (articles I–IV). The effects of task characteristics are thus not tested directly, as none of the articles compares two or more tasks in the same empirical study. Rather, this is tested indirectly by studying different tasks in different empirical studies. Articles I, II, and III compare cooperation to hierarchy (service provision by one single municipality). Article IV compares cooperation to market mode (outsourcing). Number of partners (size) tests the marginal effects, i.e. whether the effects of cooperation vary depending on the number of participants. This variable is measured in every empirical study. Organizational form is analyzed empirically only in the first article, which measures its effects on cost by splitting the cooperation category into whether municipalities organize cooperation as contractual agreements (no new organization is created) or as new cooperative organizations (Bel et al., 2022).

2. Methodology

2.1 Design: the search for causality

Most questions posed by scientist are causal in nature: "We want to know whether one event is a consequence of another event or whether the treatment influences the outcome" (Pokropek, 2016, p. 1). These could be questions about whether a vaccine really protects against a specific virus, whether social background affects achieved life expectancy, or whether welfare reforms reduce social differences. This thesis builds on a model that assumes that organizational structure can affect organizational performance (Egeberg, 1984). It thus seeks to study causality (Lewis, 1974), i.e., how an independent variable (here: organizational form) affects the dependent variable (here: performance). Even though a large part of social science focuses on establishing causal relationships, this is a field where the ability to draw conclusions about these relationships is seen as difficult (Morgan & Winship, 2015).

Causation is often summed up in three ideal dimensions that must be fulfilled to have a causal relation; (1) correlation, (2) control over all external influential factors and (3) establishing a timeline (Pokropek, 2016). In this study the only necessary condition for a causal relationship that is fulfilled initially is (1) correlation. The independent variables co-vary with the dependent variables. To fulfill (at least to some degree) the other two dimensions, the study applies control variables and instruments in regression- based analyses (Bollen, 2012).

Ideally, causality should be studied in a controlled experiment (Morton & Williams, 2010). The controlled experiment is often referred to as a 'gold standard' for causal identification, where the researcher will have full control over what receives treatment and when this treatment is received (Borgen, 2013). In the case of the present thesis, it means that the ideal empirical design would have been to study identical municipalities where some have been randomly allocated to change production of the given service to, respectively, cooperation

and privatization while the rest maintain hierarchical production mode. Studying the effects of the transition comparatively with complete control over all potential underlying variables that can affect the outcome would have revealed the causal relationship. However, experiments often cannot be executed in social research because they are either too expensive or unenforceable for ethical or practical reasons (Pokropek, 2016, 1). The latter is clearly also the case in this study. This study, as most empirical studies within political science, therefore is forced to rely on a number of observations of the phenomenon of interest (Morgan & Winship, 2015). The most common way of seeing whether the correlation between observations is a causal one is to control for other possible underlying factors (Skog, 1998). By using control variables, we thus try to create similarities to the (2) ideal; control over externalities.

A control variable is a variable that is not of interest to the study's aims but is expected to influence the results – it affects both the independent and dependent variables. The control variable is thus used in the analyses to hold this possible influence constant to be able to better isolate the effects of the independent variable (Hellevik, 2002). The use of controls is, however, highly questioned in political science (Clarke, 2005), mostly because it is impossible to create a perfectly controlled model. This ties great uncertainty to all multivariate regression analyses. Even so, it is commonly thought of as the best solution given the challenges described (see Hellevik, 2002).

In this thesis control variables are used to tackle some of the most common effects on performance in municipal service delivery. Table 1 provides an overview of the control variables used in each article. The set of controls are adapted to each corresponding analyses service context, level of analyses and availability of data.

Table 3. Control variables used in each article.

Article I	Article II	Article III	Article IV
Free revenues, Population, Geographical area, Density, Number of call-outs, Competence level, Sweeping rate, Inspection rate	Free revenues, Population, Geographical area, Density, Number of call-outs, Operating costs, Economic growth, Competence level, FTE	Varying number of members, Co-located with hospital, Co-located with ambulance, Net operational profit, Population, Density, Co-located with County administration	Free revenues, Population, Density

These controls can, very simplistically, be thought of as controls linked to different aspects of size and production (see Aldag et al., 2020; Bel & Warner, 2015b); they attempt to control for the potential benefits of being large scale municipalities with large scale production capacities. They provide common and direct measure of scale of government, and an indirect measure of an entity's output (Aldag et al., 2020). In the case of fire services, there also exist data on more direct amount of production. Demographic controls indicate how municipal borders and population are distributed. For services that have high spatial dependency (in this case, emergency primary care and fire services), population density and geographical area are expected to affect performance because low density and large areas make emergency response more challenging (Bel & Belerdas-Castro, 2021). For auditing, a service with low spatial dependency, density is used as a proxy for urbanization and thus for complexity, which is considered a cost-driving factor in municipal auditing (Johnsen, 2021). For the studies on fire services, quality indicators and cost are held constant to control for the possibility of the one suppressing the other. This was not possible in the other studies due to lack of data. The control variables aim to hold constant effects that are characterized by the research field as important drivers of performance.

2.2 Dealing with possible endogeneity

The last dimension for fulfilling causality is (3) establishing a timeline. There is a need to emphasize that this study is not a study of organizational change. In articles I, II, and IV, the empirical analyses are done by conducting cross-sectional linear regressions comparing municipalities that provide services through different modes of governance. Article III is conducted as a panel study with fixed effects. This allows for the observation of the independent variables controlling for changes and fluctuations between years. Time span is, however, relatively short, with few changes in the independent variables. This lack of before-and-after-observation makes it more difficult to determine the direction of the causal relationship. In the case of how organizational design affects performance, causality can go both ways. This creates potential problems of reverse causality. In this particular case it means that even though we expect cooperation to effect performance, we cannot exclude the possibility that level of performance affects the decision to cooperate (Bel et al., 2014; Geys & Sørensen, 2016). This describes the possible problems of endogeneity and is a much-debated issue in the social sciences. The challenge is often that it is easy to underestimate the consequence of endogeneity and difficult to address it correctly (Paxton, Hipp, Marquart-Pyatt, & Marquart-Pyatt, 2011). As Bel et al. (2014) put it, "there may be a simultaneous determination of costs (performance) and the decision to cooperate. In this regard, the estimation technique must take into account the potential bias due to the inclusion of endogenous explanatory variables" (p. 97).

A common way of dealing with this potential problem across a broad spectrum of disciplines (Bollen, 2012; Paxton et al., 2011; Pokropek, 2016)—and in studies of effects in local government, in particular (Bel et al., 2014; Geys & Sørensen, 2016)—is an instrument variable approach. This is also how the empirical work in this thesis addresses this problem. In short, an instrument variable, or an instrument, is a variable that is correlated with the dependent variable only through the explanatory variable. It is used to avoid biased inferences caused by

a correlation between the error term and the independent variables (Borgen, 2013). This is done by running the analyses in two steps. First, the endogenous explanatory variables are estimated using exogenous instruments. This regression picks up how the endogenous explanatory variable changes with changing levels of the exogenous instruments (thus establishing the relationship between both variables, or the explanatory power of the instrument on the instrumented variable). Second, the estimated values from the endogenous variables (rather than the actual) are included in the equation of interest (Bel et al., 2014, p. 98). This second regression establishes how the variation in the explanatory variable that is due to variation in the (exogenous) instrument affects the outcome variable of interest (thus – in the ideal scenario – clearing out any potential effects from the endogenous part of the explanatory variable).

Different theoretical traditions have different perspectives on why and how organizations make decisions. The instruments used in the articles analyses build on the assumption that there are some factors that cause organizations to choose particular designs. It is assumed that there exist some contextual factors that contribute to either inhibiting or promoting cooperation. When it comes to why municipalities choose to engage in IMC, the instruments rests on literature describing demographic (Arntsen, Torjesen, & Karlsen, 2018), organizational (Bel & Warner, 2015a), economic, and political drivers of or barriers to cooperation (Arntsen et al., 2018; Bel & Warner, 2015a).

The cooperation variables are thus instrumented by several instrument variables. To make sure the model is not "overidentified" because of this (see Bollen, 2012; Borgen, 2013), an overidentification test has been applied to all instruments in every analysis, in addition to underidentification tests. All instruments used in the different empirical studies are summarized in table 4. A more specific background for the inclusion of each instrument is further explained and theorized in each specific paper. To summarize, the *demographic instruments* can be said to show that geographical closeness to neighboring municipalities, larger jurisdictional area, and population growth are factors that drive

municipalities toward shared service delivery; the *economic instrument* shows that municipalities with low overall cost per capita attract more cooperation partners; the *political instruments* tap into how citizen engagement, diversity, and left-wing politics drive the decision to cooperate; and the *organizational instruments* show that prior experience with internal organizational change and cooperation in other sectors drives municipalities to share service delivery.

Table 4. Drivers of and barriers to cooperation. Instruments used in the empirical analyses (measuring increasing value on all variables)

Dimension	Instrument	Driver or barrier for cooperation	Paper
Demographic	Historical population growth	Driver	I and II
	Distance from neighboring municipalities	Barrier	II
	Latitude (Northern area municipalities cooperate less)	Barrier	I
	Geographical area	Driver	III
Economic	Earlier total cost for municipalities	Barrier	II
Political	Voter turnout	Driver	I
	Female Mayor	Driver	III
	Mayor from right-wing party	Barrier	III
	Vote share of left wing parties	Driver	IV
	Percentage of spending used on private health care	Barrier	IV
Organizational	Change in administrative structure	Driver	I
	Experience with IMC in water, drainage, and solid waste management	Driver	IV

2.3 Measurement and validity

Researchers constantly make complex choices on how to link concepts to observations, connecting ideas with facts. These choices raise the question of measurement validity: "Do the observations meaningfully capture the ideas contained in the concepts?" (Adcock & Collier, 2001, p. 529). This section discusses the core concepts measured in this thesis, i.e., performance and organizational form.

2.4 Measuring performance in public service delivery: what is a good service?

It is almost a cliché to state that the creation and definition of public value is, along with society in general, increasing in complexity (Benington & Moore, 2011). Public governments are democratic institutions wherein a multitude of concerns and voices to all times needs to be joggled and pitted against each other. The values expected from the public sector are described as multidimensional in that values like productivity and efficiency have to be balanced against less tangible values like openness, justness, and predictability (Jacobsen, 2019). In this sense, the public sector is responsible not only for providing things, like services, but for creating good societies (Moore, 1995). Alongside the growth of new public management reforms, developments in the public sector over the past decades can be described as an increase in demand for *performance* (Radin, 2000). This is accompanied by an increased emphasis on *measuring* performance (Heinrich, 2012).

Performance measurement and studies of government performance is a favorable topic of criticism, both among scholars, legislators, professionals, politicians, and citizens (Heinrich, 2012; Pollitt, 2000; Røiseland & Vabo, 2016). What aspects society chooses to measure affects what is considered important (Ordóñez,

Schweitzer, Galinsky, & Bazerman, 2009; Van Thiel & Leeuw, 2002). With this comes the acknowledgement that performance in service delivery must consist of a multitude of different dimensions that might vary in importance, depending on factors such as political regime, type of service, professional standards, values specific to a particular society, historical period, etc. Scholars who seek and analyze performance indicators must keep this in mind. In this sense, performance measurement will always be imperfect (Pollitt, 2000). What such indicators *can* accomplish is to show what kinds of performance can be expected from certain organizational forms, and thus to test whether different modes of governance promote different goals. This can then provide better grounds for decision-making among policy makers. It will be up to society (politicians and other policy makers, professionals, citizens), and not just scholars, to debate what the service or program should be accomplishing (Blom-Hansen, Houlberg, & Serritzlev, 2016; Steen et al., 2017).

Despite its many challenges and pitfalls, performance measurement is considered our most valuable means of evaluation. "It is hard—if not impossible—to form reliable judgement as to the quality of public services without measurement" (Pollitt, 2000, p. 140). With regard to the question of whether one form of governance is better than another, it is necessary to specify complex societal challenges and problems and to break them down into measurable dimensions. It is also necessary to make explicit that the effects of governance structures may depend on what is being measured, as some organizational forms are expected to be better-suited to certain objectives than others (Røiseland & Vabo, 2016). By analyzing how different modes of governance can have different strengths—in the sense that they affect different dimensions of performance in different ways—this thesis may provide some nuance to the current understanding of the effects of cooperation.

This thesis takes an instrumental view of reality, with the basic premise that some aspects of the world (here, some aspects of performance) can be measured. There can, of course, be various rationales or motives for governments and actors

to participate (or not to participate) in cooperation. Such reasons can be individual, political, or institutional (Røiseland & Vabo, 2016), and can include receiving goodwill, having altruistic motives, or assessing other benefits (Bel & Warner, 2015a; Hülst & Van Montfort, 2007b; Jacobsen, 2014). The instrumental view presumes that public governance can be designed, and that different designs may be more feasible for solving certain societal problems than for solving others. Even though the instrumental view cannot fully explain variance in the selected dependent variable, it should be able to contribute to conceptualizing how government should be organized in order to achieve the desired (measured) policies (Egeberg, 2020).

Another discussion in the literature concerns whether researchers can state that organizational structure can causally affect goals (performance) that lie outside the organization. "It is less difficult to measure what is going on in the organization than to go outside and begin measuring outcomes, impacts and the attitudes of citizens to those impacts" (Pollitt, 2000, p. 135). Here, scholars and managers are striving to provide some middle ground for public sector performance measurement (Heinrich, 2012). It is a challenge to measure the actual impact governance has on service delivery. But that does not mean that scholars should not attempt to use proxies for measuring factors that they (or policymakers, professionals, or citizens) expect will affect society and are in line with societal goals. In a review of the literature on performance measurement, Heinrich (2012) states that the more prominent features of performance measurement are focused on quality, outcomes, or results. What must be made explicit is what is being measured and how the results are to be used and interpreted. Public services must be acknowledged as having diverse, complex, and evolving goals (Benington & Moore, 2011), and performance must be defined and measured broadly (Brignall & Modell, 2000; Heinrich, 2012); one indicator may be affected differently by one organizational form than by others. This diversity in measure allows for a better understanding of and finetuning of how different governance mechanisms affect different aspects of service

delivery. "As with so many things in the public sector, the real trick may be in finding the balance between different approaches" (Peters & Pierre, 2003, p. 6). Thus, there is not (and should not be) a singular strategy or archetype for measuring performance (Heinrich, 2012).

2.5 Objectivity and genericness of performance measurement

Quality of services is a type of performance whereby a common distinction is set between perceived and objective quality. Perceived quality refers commonly to citizens' or costumers' judgement of or satisfaction with a product or service (Rowley, 1998). This type of quality measurement is widely used in studies of both single (e.g., Jain & Gupta, 2004; Rowley, 1998) and interorganizational (Roehrich et. al 2020) performance. Customer satisfaction is arguably the most important factor in a market system because it drives the purchase decision. But performance in the context of public services is more complex, with many considerations that must be weighed against one another. Public services are also often highly professionalized, which means that citizens are less qualified to make all the necessary assessments (Kelly & Swindell 2002; Rowley, 1998). Researchers have demonstrated this empirically by detecting considerable inconsistency and volatility in citizens' views (Beck, Rainey, & Traut, 1990; Heinrich, 2012). This indicates that policy makers or managers are not likely to get a clear picture on whether or not performance is improving simply by tracking citizen satisfaction ratings (Heinrich, 2012, p. 31).

Objective quality, on the other hand, usually consists of a set of performance measurements indicating a service's progress or accomplishments. These measurements are defined internally, usually by professionals (Rowley, 1998). In most cases, this does not contradict the values that the majority of citizens consider important goals of a service (Heinrich, 2012).

Classic performance indicators (Hatry, 2006; Kamensky, 1993) include information on (1) *inputs*, i.e., what resources, such as staff or equipment, the organization puts into the production; (2) *processes*, i.e., activities such as workload; (3) *outputs*, i.e., items 'produced' by the program or organization, such as units of service delivered; (4) *efficiency*, i.e., productivity and an organization's ability to produce services or other goods without wasting materials, money, time, or energy—this could, for instance, mean a decrease in costs while maintaining a constant amount of production; and (5) *outcomes*, i.e., end goals (see, also, Heinrich, 2012, p. 25; Pollitt & Dan, 2011). This thesis does not examine how a program's organizational form affects its processes or outcomes. It does it provide answers as to whether cooperation affects larger societal end goals (such as whether it makes people healthier or hinders casualties, pollution, or corruption in society). Rather, it examines how organizational form affects measurable factors (inputs, outputs, and efficiency) that are presumed to contribute to these larger outcomes. The performance measurement and, thus, the dependent variable for each article are presented in table 5. Each operationalization is described in more detail in each paper.

Table 5. Measurement of different types of performance in the selected services.

	Article I	Article II	Article III	Article IV
Service	Fire services	Fire services	Emergency primary care	Auditing
Dependent variables (Performance indicators)	Efficiency (Cost)	Output quality (response time, sweeping rate, and inspection rate)	Input quality (access to medical equipment and personnel)	Efficiency (Cost)

It is a common argument that in quantitative observational studies, reporting should clearly demonstrate the model's fit to its theoretical foundations. "Modeling based on a solid theoretical foundation is critical if researchers want to make meaningful interpretations of their results. In its absence, researchers are likely to make ad hoc interpretations that are of little academic interest" (Mele et al., 2020, p. 817). I argue that this is a more straightforward task when the

performance measurement is cost. Cost per capita is a measure of production efficiency that transfers between empirical service areas and, here, tests theories on the relationship between cooperation and costs. The results obtained from the empirical analysis can be interpreted in light of the selected theories (see, also, Mele et al., 2020, p. 817).

This is, arguably, more challenging when it comes to measuring service quality. One of the challenges when studying different empirical fields (here, fire and EPC) that have substantially different definitions of quality is making these definitions comparable. This taps into broader discussions of balancing the need for generalization and precision (Weick, 1989), and has been central in discussions in the literature of quality in public services (Rowley, 1998). While it can be difficult enough to identify and quantify appropriate dimensions for specific services, an attempt to find more generic dimensions of service quality to make comparisons between service fields possible is even more challenging (Rowley, 1998). It can also be asked whether a strong focus on theoretical validation may make the measurements less useful for the field of study (Lindblom, 1987). On the one hand, this thesis can be considered an attempt to respond to a call for identifying more uniform ways of measuring quality (Aldag et al., 2020). The attempt is not without flaws. The measurement of performance is attempted to place itself close to reality. Behind this reasoning lies the acknowledgement that performance must have relevance for the practitioners or people affected by it (Lindblom, 1987). The qualitative differences between empirical fields and access to data challenge the genericness of the dimensions of quality. These dimensions differ—not only empirically, but also conceptually, varying between inputs and outputs. Despite these challenges, it represents research on a subject where little empirical work has been done and is thus of significant relevance for practitioners and researchers alike.

2.6 Performance in interorganizational relations

Within the interorganizational relations (IOR) tradition, defining and measuring performance have traditionally been considered challenging (Keith G Provan et al., 2008). First, there is often confusion over what goals have been achieved at the interorganizational level, as well as over whether this performance is a result of cooperation or would also have occurred in absence of cooperation. Secondly, performance data on the interorganizational level are often difficult to obtain. We can argue that this potential problem is a general problem in studies of governance. Pollitt (2000) asks a similar question: "How may performance be assessed when a program is being delivered by an assortment of quite different types of organization, rather than by a single organization or a homogenous set of organizations?" (p 137).

Studies of performance are described as somewhat of the 'Holy Grail' of IOR research. One reason for which such studies are described as particularly challenging is that they often study networks with low or varying degrees of formalization and with diverging and unique goals (Provan & Milward, 1995; Provan & Milward, 2001). The complexity and measurability of interorganizational performance do, however, depend on the type of IOR considered. Klijn (2008) shows that service delivery networks operate with relatively clear outcomes, compared to governing and policy networks. One characteristic of inter-municipal service delivery is that consists of more concrete and comparable tasks (Jacobsen, forthcoming).

Using Williamson's (1985) categories of shared service delivery, the latter can, to a greater extent, be considered 'just' another organizational alternative to the traditional hierarchy, delivering the same services. This offers a basis for comparing performance in different governance modes, since all of the specific services share goals and produce the same thing. Contrary to policy networks,

much of local service provision is subject to central regulations and to specific professional service standards.

Independently of the research tradition, an impediment to studying multilevel governance (Liesbet & Gary, 2003) and interorganizational relations (Cropper et al., 2008; Keith G Provan et al., 2008) is that such research contains multiple levels of analysis. Researchers must consider the possible implications of measuring cooperation at the member or cooperation levels.

A challenge in attempting to measure performance from cooperative arrangements is to determine at what level it can and should be measured, i.e., at the level of the cooperation or at the level of the participant (Provan et al., 2008; Turrini, Cristofoli, Frosini, & Nasi, 2010). It can be argued that what constitutes the 'best' level will depend on what one aims to compare and at what level it is possible to measure performance in the specific case at hand. If the aim is to compare different modes of governance at the service units, performance should be measured at the level of the cooperation. If, on the other hand, the aim is to compare whether participation in an inter-municipal cooperation is better (or worse) than standing alone, the analysis should be conducted at the level of the individual participants (Isett, Mergel, LeRoux, Mischen, & Rethemeyer, 2011; Provan, Fish, & Sydow, 2007).

The empirical studies in this thesis vary in their levels of analysis. The reason for this variation is that the independent variables are measured at different levels. The studies of fire services and auditing are analyzed at the member level. They are studies of whether individual municipalities increase *their* performance in service provision by engaging in (various sizes and forms of) inter-municipal cooperation. The level of interest is the individual member organizations. The unit of analysis is, thus, each individual municipality. The studies measure how producing certain types of services in cooperation with other municipalities versus producing it alone affects performance for each municipality.

The quality indicators in the EPC article (III) are situated at the interorganizational level (production unit). This means that, in contrast to many studies on the effects of IMC (and article I, II and IV in this thesis), this study does not focus on the municipal level and thus does not explicitly focus on the effects of IMC for each municipality. Instead, it studies performance for the service-providing unit (in this case medical equipment and personnel for each EPC). The results of the empirical studies should be interpreted with these differences in level of analysis in mind.

This thesis argues that market, hierarchy, and network forms of governance have different strengths and weaknesses and promise different things. Furthermore, performance measurement demands a pluralistic approach (Røiseland & Vabo, 2016), meaning that the contributions from this thesis can only be considered a grain of sand in a whole that constitutes public sector performance research. The role of researchers is, through various scholarly traditions, to provide empirical evidence that, in its totality, may shed light on how the governance and organization of public administration affects what is seen as important in public service delivery.

Another thing that requires elaboration is the operationalization of cost and scale economies. A common definition in the field is that "economies of scale exist when average cost decreases as production increases" (Bel & Warner, 2015b, p. 55). In many countries, municipalities are responsible for a range of complex tasks (Hülst & Van Montfort, 2007b). A characteristic of complex tasks is that they are difficult to gauge. This is makes them difficult for practitioners to contract (Brown & Potoski, 2005). It also makes it difficult for scholars to measure their performance for research purposes. For tasks such as emergency services, it is difficult to establish a unit price per, for instance, fire service. Even though auditing services can be labelled with easier measurability, we lack explicit data measuring the amount of auditing produced. As in other studies in the field that analyze cooperation's effects on cost (Bel & Belerdas-Castro, 2021;

Sørensen, 2007), cost is, in this thesis, measured as operational cost per capita; whether or not scale economies can be achieved is investigated by testing how cooperation affects the operational expenses municipalities have per inhabitant. This is not a direct measure of transaction cost, which Williamson (1996) defines as "comparative costs of planning, adapting and monitoring task completion under alternative governance structures" (p. 142). Transaction cost is considered a difficult objective to fully capture, resulting in broad operationalization of its concepts (Jacobsen, forthcoming). In the present thesis, the concept builds on the idea that the variance in cost that is explained by cooperation, all else being equal, represents the cost (or decrease in cost) linked to the cooperative (or other governance) arrangement.

2.7 Cooperation, scale and size

Dahl and Tufte (1963) begin their discussion of the dimensions of size and democracy with the idea that "a territorial entity has several dimensions of size: population, area, density, and others" (p. 17). They further elaborate that "most discussions of the relationship between size and popular government use population as their criterion size". Number of inhabitants lies at the core of considerations about local government scale and amalgamation. When scale is used as an independent variable here, it is not as an up-scaling but, rather, as what Baldersheim and Rose (2010) describe as 'trans-scaling,' i.e., cooperation between units. The scale of cooperation is not measured by its number of inhabitants, but by its number of cooperating jurisdictions. In the studies conducting analyses at the member level (fire services and auditing), scale of cooperation controls for both size of the jurisdiction and number of inhabitants in the single municipal unit. In the study conducting analysis at the service level (EPC, article III), it controls for size of jurisdiction and population in each service area (municipal or inter-municipal).

An issue that must be made explicit is how one can measure scale economies and other benefits of scale when the level of measurement is single municipalities. Articles I, II, and IV are empirical studies of how organizational form affects performance on a member-organizational level. Here, all control variables are measured at the single municipal level. The audit study (IV) shows that even though it is possible to control for population at the municipal level, it is in this particular study, not possible to separate the effects of number of members from the population size of the region covered by the inter-municipal cooperation in the IV analyses, because this gives IVVIF-values that are too high. This shows that the effect of number of members and population size in the cooperation area are too intertwined to be separated properly when accounting for the possible reverse causality using an IV-analysis.

2.8 Validity of tasks characteristics

Table 6 shows how the selected services score on different dimensions of task characteristics. As described in section 1.10, emergency services have an overall high score and thus represents tasks with low contractibility, while auditing has a low score and represents a task with high contractibility. This is a simplification for the purpose of creating a conceptual model. There will never be a perfect fit between reality and theory (Chalmers, 2013). For instance, as outlined more thoroughly in papers III and IV, fire services have even stricter central regulations than emergency primary care when it comes to maximum response time, making it score higher on geographical dependence than EPC. They are, however, both placed in the 'high' category because they both are considered services that needs to be in spatial proximity to its users.

Table 6. Selection of service characteristics.

Task characteristic	Low	High
Uncertainty	Auditing services	Fire services, Emergency primary care
Frequency	Auditing services	Fire services, Emergency primary care
Asset specificity	Auditing services	Fire services, Emergency primary care
Geographical dependence	Auditing services	Fire services, Emergency primary care
Complexity	Auditing services	Fire services, Emergency primary care

The development described earlier states that the public sector has expanded in its responsibilities. The increased provision of public tasks and services to inhabitants has, especially in the Nordic states (which are decentralized welfare states), mostly been carried out at the local level (Eythórsson, Kettunen, Klausen, & Sandberg, 2018). This expansion has manifested in a variety of different services provided by municipalities (Hülst & Van Montfort, 2007b; Leknes et al., 2013). A general development is that these tasks provided by local government have become more and more complex. Health and social services, which occupy the largest post in municipal budgets, are, as emergency services, described as difficult to gauge. Ever-increasing technological development also increases the asset specificity of services. Information technology contributes to decreasing geographical dependence in some services, such as administration, planning, and certain services that are directed at citizens. It is, for example, no longer necessary to have a tax office in each municipality. Some tasks, such as home-based health and social services, are, however, still dependent on spatial proximity to their users (Jacobsen, 2020; forthcoming).

2.9 Data sources

An advantage of using 'objective' measurement is that it is generally considered reliable. Studies show that the more objective survey questions are (number of employees, vehicles, money, kilometers, etc.), the higher the reliability is (Alexander, Bergman, Hagströmer, & Sjöström, 2006). This does not mean, however, that more objective variables are not subject to challenges with reliability.

Table 7 provides an overview of the data used in the empirical analyses. Each variable from the different data sources is described in greater depth in each article. This section provides an overview of the different sources used in all empirical work. Norwegian municipalities are mandated to report various economic data yearly to Statistics Norway. As in other countries, it is more difficult to create useful categories for some sectors than for others (Holz, 2003; Kawai & Tasaki, 2016). This is the case for the service area of emergency primary care, and the reason for which there is no economic variable available for measuring spending regarding this specific task. It is considered too difficult to separate EPC's economic activity from the general primary health offer to provide reliable data from each municipality (Holmøy, 2006).

Mapping reliable data on IMC's organizational foundations has proven to be challenging (Jacobsen et al., 2011; Leknes et al., 2013). This was also the case in this study. It was, in the case of all three service areas, necessary to manually check the entire cooperation constellation in terms of members. The national out-of-hours services registry, from which the organizational variables for the EPC study were retrieved, suffered from sources of error when it came to measuring the organizational form of IMC.

The only case in which the dataset had enough variation and high enough reliability to analyze organizational form of cooperation was fire services (for more in-depth information on the data collection, see article I).

Table 7. Overview of data sources

Data source	Type of variables	Variables	Article
Statistics Norway	Dependents, independents, controls, instruments	Economy, Demography, Workload (fire services).	All articles
Norwegian Directorate for Civil Protection	Dependents, independent, controls	Input and output quality, organizing of IMC	1 and 2
Norwegian Association of Local and Regional Authorities	Instrument	Change in administrative structure	1 and 2
NSD (Fiva, Halse, & Natvik, 2020)	Instruments	Democracy, demography	1, 3, and 4
National Center for Emergency Primary Health Care	Dependent, Independent, Controls	Input quality, organizing of IMC, location	2
The Norwegian Association of Municipal Auditors	Independent variables	Organizing of IMC	4

2.10 Generalization and transferability: what are local governments in Norway a case of?

An important issue when it comes to generalizability is determining to what population one aims at generalizing the selection (Ruddin, 2006). Does the studied phenomenon have transfer value to other or larger groups in society (Skog, 1998)? In this case, does the population one aims at explaining encompass all municipalities in Norway? Scandinavian municipalities? European municipalities? Municipalities all over the world? Small municipalities or larger municipalities? Organizations in general?

This section is devoted to discussing the transferability of the empirical study. It does not provide a definitive answer to all aspects local governments in Norway can be representative of but raises some question of how general the cases and findings can be claimed to be. Transferability is important for scholars in terms of how widely these findings can contribute to the accumulation of knowledge, as well as for practitioners, in terms of the practical applicability of the findings.

Conceptual transferability

Theoretical concepts are used to simplify the world in order to make sense of it. They enable inferences from the knowledge accumulated by scholars in relevant disciplines. Such inferences are obtained by building models that increase understanding of the specific empirical object of study and expand knowledge of a more general societal phenomenon (Chalmers, 2013; Van de Ven, 2018). In this thesis, simplification has been a matter of viewing municipalities as organizations that take on different organizational forms and produce services that vary in different transaction-specific characteristics. These theoretical concepts are, in principal, not limited to a specific case (Tsang, 2014). This lays the grounds for arguing that the results, in principle, can have potential transfer value to all organizations characterized by similar organizational forms and task characteristics, and that produce similar things. Whether and to what extent this argument holds, however, must be empirically tested.

Transferability in the empirical field

European countries vary on a variety of dimensions that provide different territorial and institutional frameworks for local governance (Baldersheim & Rose, 2016; Ladner et al., 2019). Comparative studies show that there are great differences among nations' number of governing levels, size of jurisdictions, and division of tasks (Baldersheim & Rose, 2010b).

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Norway is often described as representative of the Scandinavian administrative tradition, which is characterized by a decentralized administrative welfare model that makes local government the largest provider of public services (Bel et al., 2022). The principle of the generalist municipality (*generalistkommuneprinsippet*) has a strong hold in the Scandinavian model compared to many other European countries (Baldersheim & Rose, 2016). This indicates that all municipalities, regardless of size, have the same functions, which include responsibility for a wide range of complex tasks that require a high level of competence. Based on data from Statistics Norway, Norway is a country that, as of 2021, consists of approximately 5.4 million people inhabiting 359 municipalities. During the period over which this research was being conducted, Norway went through an amalgamation reform that reduced the number of municipalities from 428 (in 2014) to 359 (in 2021). The average number of people in each municipality is 15,000 (up from approximately 12,000) and the median number is just over 5000 (up from approximately 4,600). Norwegian municipalities vary considerably in size, in terms of both number of inhabitants and population density.

From a European perspective, average municipal size, in terms of population, varies from approximately 1,700 in the Czech Republic to 148,000 in Great Britain. In a comparison of 31 European countries, Norway is placed close to the median (Baldersheim & Rose, 2016). Norway's municipalities are generally smaller than Denmark's, Finland's and Sweden's in terms of number of inhabitants (Eythórsson et al., 2018; Erlingsson, 2021; SOU, 2020). At the population level, it can be asked whether size can affect municipalities' chances of extracting scale benefits from cooperation (Bel et al., 2022), and size may affect which problems are seen as trans-boundary (Baldersheim & Rose, 2010b). Norwegian municipalities are, geographically, larger than Danish ones but smaller than the Swedish and Finnish average. Geographical area and population density can be of importance to the transferability of results, especially for services with a high need for physical proximity (Klausen, Renå, & Winsvold,

2014). When it comes to local autonomy, the Nordic countries, along with Switzerland, Germany, and Lichtenstein, constantly rank highest among the European countries (Ladner et al., 2019). This is reflected in what is termed 'decentralization.'

The extent and institutional features of IMC have undergone comparative mappings and analyses in the European context (Bel et al., 2022; Hülst & Van Montfort, 2007a; Teles & Swianiewicz, 2018). Unfortunately, there are no equivalent comparative analyses concerning the USA or developing countries (Bel & Sebő, 2021). Shared service delivery has "proven to be popular in countries where municipalities have substantial responsibilities in the field of service delivery" (Hülst & Van Montfort, 2007a, p. 227). The decentralized service production in Scandinavian countries thus creates an environment in which IMC may prosper. Earlier mappings show that, on average, Norwegian municipalities are included in 11 different IMCs that generate approximately ten percent of each municipality's expenses to service provision (Bel et al., 2022; Leknes et al., 2013).

Another aspect of transferability from the national context is the actual services, meaning, here, fire protection, emergency primary care, and auditing. The quality indicators for fire and EPC build on measurements that are empirically and conceptually anchored in international literature (Kelly & Swindell, 2002). As mentioned earlier, cost is commonly measured as cost per capita, as in Bel and Belerdas-Castro's (2021) study of the effects of cooperation on Spanish fire services. The likeness in measurement of cost increasing the studies comparability.

Another aspect is the comparability of the institutional features of IMC. Recent studies show how European countries differ in IMC governance arrangements and in the types of services provided through these arrangements. In a comparative study of Norway, the Netherlands, Germany, Poland, the Czech Republic, Italy, and Spain, a main division of the institutional arrangements

within IMC is set, as outlined earlier, between contractual agreements and joint organizations (Bel et al., 2022).

As described in Bel et al. (2022, p 15); in the Norwegian context, shared service delivery is organized as single services, and the scope of IMC varies between service areas. Shared service delivery can be categorized under four main legal forms of cooperation. The first three entail creating an IMC organization, and the last one involves delegation (no IMC organization is created). First and most commonly, municipalities form inter-municipal companies, either with limited liability (regulated by private law) or with unlimited liability (regulated by public law). The latter form was created to facilitate stronger control by owners than the company model regulated by private law allowed, by making the supervisory board more influential. The third form of cooperation, 'task communities' (*oppgavefellesskap*), was incorporated into the municipal act in 2020. Whereas companies are always legal entities, task communities can choose whether the IMC shall have its own legal status. It is subordinate to a board consisting of representatives from the participating municipalities. While the company models are aimed at extensive service provision, task communities are aimed at less formalized, smaller scale cooperation. This legal model replaced the former '§ 27-cooperation[1],' where municipalities created a joint board. The present study was conducted between 2014 and 2020 and does not include task communities in its research material. Fire services were measured in 2017, and thus participate in cooperations as joint boards and companies. All '§ 27-cooperations' are required to change organizational form by 2023. Task communities are an attempt to adapt to some of the challenges linked to the '§ 27-cooperations', for instance by making it mandatory to specify whether the cooperation was its own legal subject[2].

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[1] This legal form is described more in-dept in the appendix 'Organizing of inter-municipal cooperation in Norway'

[2] https://www.samfunnsbedriftene.no/advokattjenester/selskapsrett/%C3%B8vrige-selskapsformer/hva-er-forskjellen-pa-iks-og-kommunalt-oppgavefellesskap/

The fourth form of cooperation involves the delegation of tasks and is regulated by the municipal act and defined as administrative host municipality cooperation (*vertskommunemodellen*), where member municipalities delegate responsibility for a task to one municipality. This form of contractual agreement puts one municipality in charge—often a large one. This form of delegation is also present in Italian *convenzione*, Polish *porozumienie międzygminne*, Dutch *centrumgemeenteregeling*, and German *zweckvereinbarungen* (Bel et al., 2022). The assumed challenge of these forms is the aforementioned possible asymmetry in influence and information, which may impair performance and create costs linked to renegotiation. A more detailed description and notes on the legal forms specific to the Norwegian context are provided in the appendix: 'Organizing of inter-municipal cooperation in Norway'.

3. Findings and reflections

The main question this thesis seeks to answer is *under what condition can shared service delivery be beneficial*? The answer to this question is sought by analyzing how cooperation in different contexts affects different types of performance. The study's empirical work is constituted of four separate articles. Each article uses one specific service as an empirical case for analyzing the effects cooperation on one or two distinct dimensions of performance. Together, these studies provide an empirical ground for comparing and discussing how the effects of cooperation may depend on cooperation size and tasks characteristics. This section provides a compression of the study's findings. The compression helps to clarify the variation between services with different task characteristics, cooperation sizes, and performance characteristics.

Fire services (articles I and II) represent a type of service with high spatial dependency and low contractibility. The general analyses, which compare cooperation with the traditional hierarchical model, show that cooperation affects costs negatively and quality positively (good initial news for cooperation). But when the analyses are nuanced and the marginal effect of each member is calculated, the picture changes:

Figure 1: Cost (Article I)   Figure 2: Quality (Article II)
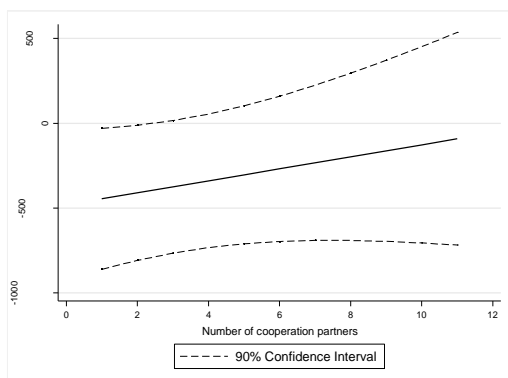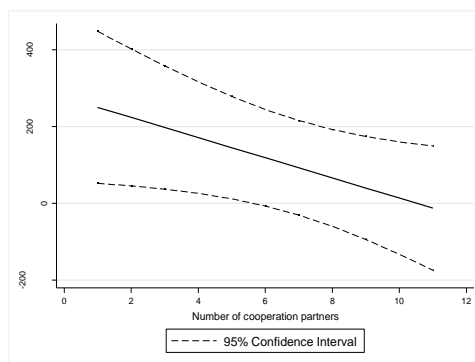
Figures 1 and 2 show that when members are included, costs increase and quality decreases, indicating that, in this case, the more partners that are included, the costlier service provision becomes, and an increase in members leads to poorer performance. Figure 3 shows that there is a statistically significant cost benefit in entering contractual agreements with other municipalities, as long as these cooperative arrangements include few members. Joint contracting is thus most cost beneficial in small cooperations.

Figure 3: Marginal effect of contract partners on costs (Article I)
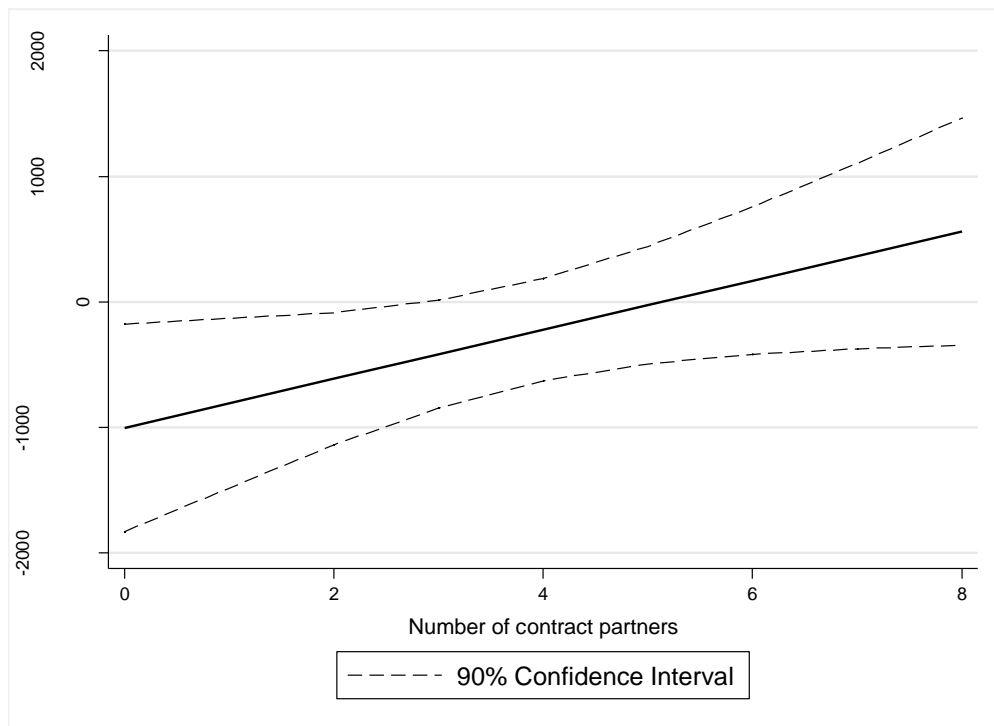
Emergency primary care (article III) represents the same task characteristics as fire services. The dependent variables show two dimensions of input quality. The general effect, here, shows that cooperation affects both dimensions negatively. When the analyses are nuanced and the marginal effect is calculated, the results diverge.

Figure 4. Medical equipment   Figure 5. Work force
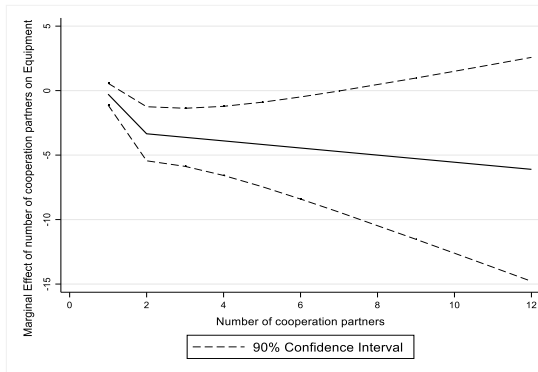
(Article III)   (Article III)
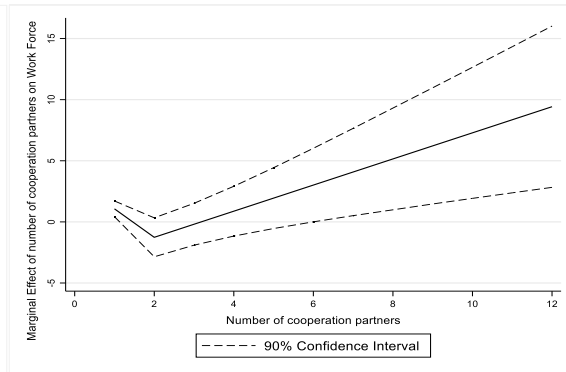
Figure 4 shows that when the number of members increases, access to medical equipment decreases. By contrast, cooperation has to reach a certain number of members to achieve the optimum scale of operation when it comes to work force (figure 5). The study shows that the effect of number of members varies with the type of performance.

Auditing (article IV) represents a case with low geographical dependence and high contractibility. The general effect shows that cooperation has a positive effect on costs, indicating that the market mode is less costly. When the analyses are nuanced and the marginal effect is calculated, the effect curves, indicating significant scale benefits linked to cooperation (but never exceeding the market mode).

Figure 6. Cost (Article IV)
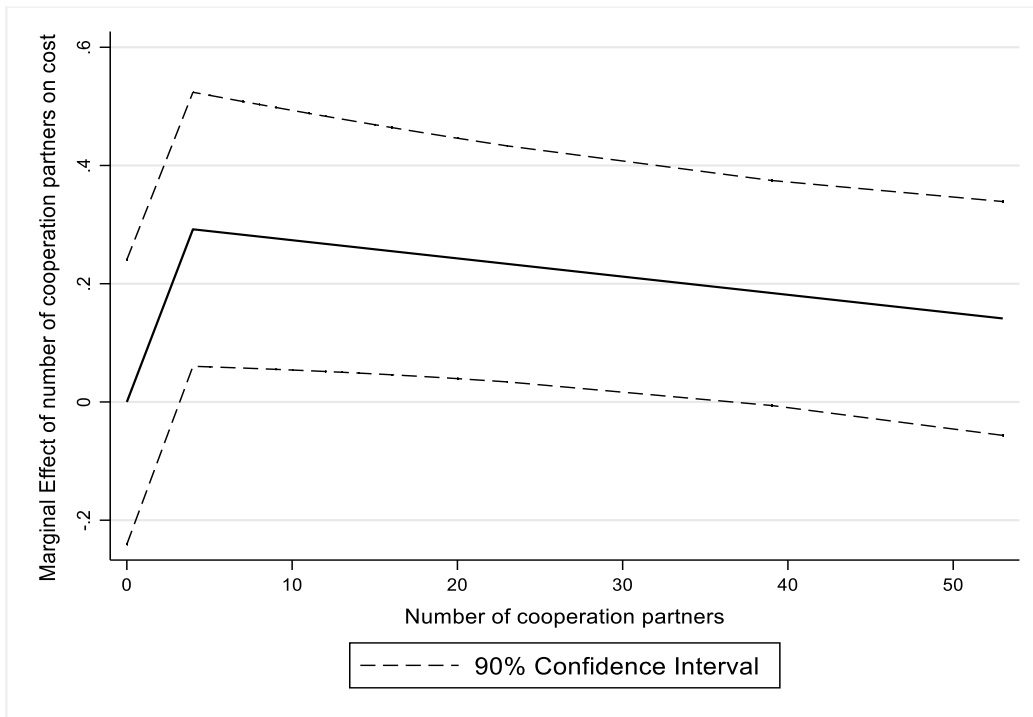
Figure 6 shows that privatization decreases cost in auditing services. Increase in cooperation size lowers costs for cooperating municipalities. Cooperation (regardless of the number of members) does not, however, achieve costs as low as those provided by the market.

The results from all four articles are summed up in table 7. First, the studies jointly show that the effects of cooperation vary between service areas. For fire services, costs increase with the number of members, in contrast to auditing, where there are significant economies of scale linked to an increasing number of members.

Secondly, in many cases, the general effect of cooperation (or not) and the number of members go in opposite directions. This indicates that the number of members is an important factor to take into account when studying the effects of cooperation.

Table 7. Summary of studies

Study	Article I: Blåka (2017). Does cooperation affect service delivery costs? Evidence from fire services in Norway.	Article II: Blåka (2017). Service Quality, Inter-municipal Cooperation and the Optimum Scale of Operation: The case of local fire departments in Norway.	Article III: Blåka, Jacobsen, & Morken (2021). Service quality and the optimum number of members in inter-municipal cooperation. The case of emergency primary care services in Norway.	Article IV: Blåka (under review). Does cooperation affect service delivery costs? Privatization, cooperation, and the optimum number of members in Norwegian local auditing services.
Academic outlet	Public Administration	In Trondal J. (ed.). *The Rise of Common Political Order Institutions, Public Administration and Transnational Space.* Edward Elgar Publishing	Public Administration	Under review
Service	Fire services	Fire services	Emergency primary care	Auditing
Dependent variables (Performance characteristics)	Cost	Output quality (response time, sweeping rate, and inspection rate)	Input quality (access to equipment and personnel)	Cost
Independent variables:				
Mode of governance	Cooperation versus hierarchy Form of cooperation	Cooperation versus hierarchy	Cooperation versus hierarchy	Cooperation versus market
Marginal effects variable	Number of cooperation partners	Number of cooperation partners	Number of cooperation partners	Number of cooperation partners
Control variables	Free revenues, Population, Geographical area, Density, Number of call-outs, Competence level, Sweeping rate, Inspection rate	Free revenues, Population, Geographical area, Density, Number of call-outs, Operating costs, Economic growth, Competence level, FTE	Varying number of members, Co-location with hospital, Co-location with ambulance, Net operational profit, Population, Density, Co-location with county administration	Free revenues, Population, Density
Method	Study conducted with a database of 427 municipalities. Data for 2013 (cross-section). An instrumental variables approach is used to deal with possible reverse causality. A two-stage least squares estimation is used to analyze costs, controlling for the decision to cooperate.	Study conducted with a database of 427 municipalities. Data for 2013 (cross-section). An instrumental variables approach is used to deal with possible reverse causality. A two-stage least squares estimation is used to analyze output quality, controlling for the decision to cooperate.	Study conducted with a database of 198 EPCs. Panel data for 2014, 2016, and 2018 (542 units). An instrumental variables approach is used to deal with possible reverse causality. A fixed effects two-stage least squares estimation is used to analyze input quality, controlling for the decision to cooperate	Study conducted with a database of 352 municipalities. Data for 2020 (cross-section). An instrumental variables approach is used to deal with possible reverse causality. A two-stage least squares estimation is used to analyze costs, controlling for the

				decision to cooperate.
Level of analysis	Member	Member	Cooperation	Member
Main findings	Cooperation contra municipal production decreases cost, but an increase in number of cooperating partners increases cost. Cooperation without IMC organization lowers cost.	Cooperation contra municipal production enhances output quality, but an increase in number of cooperating partners decreases output quality.	Cooperation contra municipal production decreases input quality. An increase in number of cooperating partners decreases access to medical equipment but increases access to personnel when number of members reaches a certain level.	Cooperation contra privatization increases cost. Increase in cooperation size lowers cost for cooperating municipalities.

3.1 Discussion

Inter-municipal cooperation has increasingly been seen as a middle-way strategy for balancing the cost of decentralized service delivery with the need for accountability and responsiveness to citizens (Andersen, 2011; Dixon & Elston, 2019). Cooperation does not replace existing entities in public administration but creates more or less institutionalized links between them (Hülst & Van Montfort, 2007a). From an organizational theoretic view, these supplementing structures are organizations' adaptation to the interdependency of different entities (Mintzberg, 1989). From a territorial perspective, cooperation, or 'trans-scaling,' is an adaptation to the challenges that arise from the decision to have small local government entities (Baldersheim & Rose, 2010b). Independent of these perspectives, cooperation is viewed as a way of achieving desired effects. The findings in this thesis support earlier discussions that argue that these supplementary arrangements come with both costs and benefits (Aldag et al., 2020; Hülst & Van Montfort, 2007a; Teles, 2016). Cooperation is advantageous in some settings, but not in others. The empirical work here shows, through multiple performance indicators, that the tasks characteristics and institutional features of the cooperation determine whether and to what extent shared service delivery is beneficial.

The claim *it depends on what you share* (see, also, Aldag et al., 2020) is supported by the divergence found in the empirical cases that differ in transaction-specific characteristics. The papers on fire services (article I) and auditing (article IV) examine whether mode of governance affects costs in two service areas that differ largely in complexity, spatial dependency, frequency, and asset-specificity. The results support transaction cost claims showing that services with high contractibility (e.g., auditing) are most feasible with the market mode when it comes to spending. It also shows that, in general, services characterized by high geographical dependence (e.g., fire and EPC) have more limited potential for creating benefits of scale when it comes to cost and some dimensions of quality. In practical terms, this suggests that administrative services such as auditing (or information technology, accounting, tax offices, etc.) that are not dependent on physical proximity to the municipal organization can decrease spending by being outsourced to private companies. This is also supported by the service high contractibility (having low asset specificity, frequency, and complexity). Results show that fire services, which are highly geographically dependent and otherwise have low contractility are, in general, initially able to extract both quality and economical scale benefits from cooperation when compared to single-municipal production. These findings are, as shown in section 3, nuanced when the marginal effect of cooperation size is measured.

The classic and ongoing discussion of optimal size and scale is a central element in local government studies, both in theoretical and practical terms (Dahl & Tufte, 1973; Dixit, 1973; Tavares & Feiock, 2018). The operationalization of what constitutes the size of an entity also varies (Hülst & Van Montfort, 2007b; Hülst & Van Montfort, 2012; Hülst & Van Montfort, 2007a). The focus here is, as previously stated, a cooperation's number of member municipalities. The goal has not been to detect one optimum scale of operation, but, rather, to test the assumption that different contexts and conditions will have different optimum scale.

The results support this assumption. For auditing services, there are significant scale economies linked to cooperation (i.e., the more members, the better), although they never exceeding the market in cost efficiency. The market mode is thus more cost-efficient than cooperation. In the case of fire services, scale benefits are exhausted at a low number of members. For fire services, cooperation has a higher optimum number of members when it comes to quality than when it comes to cost. In this case, scale economies are more limited than quality gains. This supports the argument that transaction costs exceed potential scale economies for services that have little potential for being centralized. As discussed in greater depth in the articles, fire services are subject to clear state regulations when it comes to maximum response distances. This supports the interpretation that a high number of members results in suboptimal spending because the service must, at any rate, be provided near inhabitants and in all areas. The costs of cooperation do in these cases exceed the benefits.

The EPC article (III) also shows that the number of members affects service quality. When we simplify the analyses and look at cooperation versus hierarchy, it states that EPCs provided by single municipalities are better at providing access capacity and investing in equipment than EPCs organized as cooperations. Again, this effect is nuanced when the cooperation category is opened up and the marginal effect of number of members is analyzed. Then it provides evidence of the claim that cooperation affects different dimensions of performance differently. Increasing cooperation size promotes some aspects of service quality and impairs others. The findings allow for the interpretation that the possibility of a cooperation's extracting resources due to increasing scale depends on the level at which these resources are situated. In the case of EPC, the more members that are included in the cooperation, the lower the access to equipment becomes. By contrasting, large-scale cooperation achieves the best access to personnel. In fact, cooperation has to reach a certain size before reaching the optimum scale of operation. This interpretation is supported both by transaction cost scholars and the multiple principal perspective. Scale benefits are easier to achieve when the

resources in question is situated and exists in each member municipality independently of whether the municipality cooperates or not. In the case of EPC, doctors are employed in each municipality and are mandated to participate in the EPC work shift arrangement. An increasing number of cooperating members almost automatically increases the pool of resources available to the shared service unit. The mechanisms of allocating resources are different when it comes to resources that have to be allocated and prioritized at the inter-municipal level. The findings indicate that having fewer members (or being alone) makes it easier to prioritize and agree on investments. These findings are also echoed, to some extent, in the existing literature from the empirical field. Swianiewicz and Teles (2018) describe that smaller cooperations, in terms of members, were found "easier and smoother" (p. 340). One reason for this was "related to the low number of partners which need to agree on crucial decisions". The more partners involved, the more difficult it becomes to create what Feiock (2007; 2009) describes as efficient collective action. Cooperation and an increasing number of principals impair the ability to allocate resources. This supports the argument in section 1.9, stating that cooperation's prioritization of a service will not be greater than the preferences of the principal with the lowest prioritization of the service. The more cooperating members, the higher the likelihood of the inclusion of a member with low prioritization of the task.

Organizational form also influences cooperation's ability to extract scale economies. This echoes basic organizational assumptions that smaller organizations can benefit more from simple forms of organizing than larger ones (Mintzberg, 1979). This finding can also be interpreted using agency and transaction cost assumptions. "While trust breaks down with an increase in the number of actors, formal rules reduce transaction costs and allow a greater number of actors to cooperate" (Bel and Warner, 2015 p. 58). For municipalities in cooperations with few members, cooperation through contractual agreements is more cost efficient than establishing new interorganizational entities. The findings support inter- organizational perspectives and the assumption that an

increase in the size and number of actors increases an organization's complexity, such that the organization opts for more formalized structures (Provan et al., 2008). Small organizations (in terms of number of members) are feasible with simpler arrangements, thus through joint contracting rather than establishing full-scale joint organizations.

These findings support the increasingly widespread argument that cooperation is no panacea. The findings show, empirically, that there is no 'one-size-fits-all,' because the effects of cooperation are highly dependent on the size of cooperation. Furthermore, the findings support and provide new evidence to the literature advocating that "services should be treated differently when it comes to selecting the mode of provision" (Dixon & Elston, 2019, p. 26). The success of cooperation depends on what is shared, what is desired, and how it is organized. Zooming out from the local government setting, it can be argued that these findings have validity for public administration and governance theorists, more generally. It gives some body to the challenges posed by Christensen and Lægreid (2012) in asking whether post-npm reforms and governance have been proposed with a 'one best way' orientation. The present research supports the claim that there is no one best way, but, rather, several conditions that determine the success or failure of cooperation.

3.2 Conclusions and contributions

The present study's main findings can be summarized by the three following points: First, the effects of cooperation depend on the type of task that is shared. High contractibility and potential for centralization enable scale economies due to co-production but cannot compete with the cost efficiency provided by the market. There are scale benefits for tasks with low contractibility and high geographical dependence, but these benefits are more quickly exhausted with an increase in the number of cooperating members.

Secondly, smaller cooperation (in terms of number of members) can benefit economically from the co-production of services through relational contracting, as opposed to creating new organizations at the interorganizational level.

Third, the possibility of extracting scale benefits depends on where the resources that are to be allocated are situated. Cooperation will be beneficial if the resources of interest exist in each member municipality independently of whether the municipality cooperates or not. In this case, an increase in the number of members will expand the pool of available resources. However, the multiple principal problem arises if the resources have to be created and prioritized at the interorganizational level. The more principals involved, the more difficult it becomes to agree on investments, and the lower priority of the service quality becomes.

These findings contribute to the ongoing debate among local government scholars as to what conditions determine the success of failure of IMC. They also provide new empirical ground supporting the claims of both transaction cost theory and the multiple principal perspective. Cooperation comes with a cost, and multiple principals create multiple principal problems.

There is a growing emphasis on the notion that research needs to provide useful information (Egeberg, 2020; Teles, 2016), both to the scientific community and to the practitioners and policy makers designing reforms and implementing public policy. With regard to IMC, the argument is that it is necessary to know what its effects are in order to know when and how it is beneficial to use it (Teles, 2016). Even though researchers should strive to translate findings into practical knowledge, it is important to acknowledge, both in general and in the case of IMC, that neither general nor specific conclusions provide definitive answers. The world is too complex to accommodate the expectation that 'all will go well in service performance' if policy makers follow the advice through findings from researchers—which, in this case, is derived from studies conducted at the population level (Bogenschneider & Corbett, 2011). Statistical models are imperfect and will never fully encompass the reality, goals, or struggles of each

unique municipality. But they can shed light on some general causal mechanisms that are useful to consider when designing governance.

The findings herein can translate into practical knowledge for policy makers because they advise the latter to consider a task's contractibility and suitability for centralization before deciding whether and on what scale to cooperate. Policy makers should also consider cooperation size when designing the organizational form and thus the legal basis for cooperation. Evidence from this research suggests that transaction costs will be lower for small scale cooperations if they choose a simple structure, meaning joint contracting rather than the creation of joint organizations.

Lastly, policymakers should consider what goals they intend for a service to attain when deciding whether and on what scale they want to engage in IMC, because different governance modes boost different dimensions of a service's performance. Large-scale cooperations can be beneficial if the resources that are to be allocated are situated at the member level and exist independently of cooperation; in this case, an increase in the number of members will increase the pool of available resources. However, these large-scale cooperations struggle if the resources need to be created and invested in at the inter-municipal level. This knowledge can be utilized. An appropriate question for policy makers, practitioners, and researchers to ask next is not just whether large-scale cooperation is undesirable if developing service quality is in focus, but whether it is possible to create governance mechanisms that counteract this systematical inefficiency in ability to prioritize the service. The knowledge that large collaborations can lead to poor prioritization can provide an opportunity for developing mechanisms to ensure efficient prioritization.

The introduction to this thesis emphasized that IMC has often been portrayed as 'the best of both worlds,' and that its trans-scaling has been considered a better alternative than the up-scaling enacted by amalgamation; indeed, the amalgamation literature shows depressing results in terms of benefits of scale and democratic accountability. This thesis does not present cooperation as an

unproblematic alternative to mergers (or privatization). Cooperation is not a universal solution for extracting service delivery benefits of scale, but, rather, depends on conditions linked, at least, to the task at hand and the form and size of IMC.

3.3 Limitations

The methodological limitations of the present study have been discussed in section 2 and in each corresponding article. This section addresses the conceptual limitations of zooming in on very specific effects. Doing so creates a narrow focus that some may argue inhibits the possibility of seeing the bigger picture.

It is a common impression among scholars and practitioners that IMC is "mostly about the way we deal with service delivery" (Swianiewicz & Teles, 2018, p. 343), and is a way of creating benefits of scale and solving problems that span over territories (Baldersheim & Rose, 2010b). Obviously, these problems extend much further than the ones addressed in this thesis. An obvious limitation of this study is its narrow focus when it comes to effects. There is a vast body of literature that discusses the democratic implications of IMC with the use of concepts that this study has not analyzed, such as accountability, political representation, and citizenship. Thus, the empirical evidence from this thesis provides a contribution solely on operative effects and can be placed within the public administration research tradition (see, also, Teles, 2016). Furthermore, performance literature dimensions span way further than the ones addressed here, i.e., inputs, outputs, and efficiency (see also Heinrich, 2012). This thesis has focused on isolating some dimensions of performance that are expected to be affected by cooperation. It is, of course, possible that cooperations have some other advantages which could, for instance, make them more costly; – that this study has not managed to hold constant. It could be the case that specific IMCs

tend to create a good work environment and are able to refine some types of competences or make cooperation in other fields easier.

This study also differs when it comes to the organizational mode to which cooperation is compared. In Norway, the provision of emergency services is not subject to privatization, and the municipalities that provide auditing through hierarchy are too few to analyze statistically. Consequently, auditing is analyzed by comparing cooperation to the market mode, while emergency services are analyzed by comparing cooperation to hierarchy. There is, thus, no one integrated analysis of all modes.

Further, this study does not take into account all specific motivations each municipality may have for cooperating, or that these motivations can be broader than providing efficient and high-quality services. It does not study motivations; rather, it studies effects independently of a possible variety of motivations. Building on the notion that public values are complex and may contradict one another (Benington & Moore, 2011), policymakers may have several motivations for engaging in cooperation that that fall outside the scope of this research. Motivation may, for instance, concern keeping jobs in the region or taking a stand against privatization. The empirical work here, as in all research, is limited by its access to data, and will therefore only provide glimpses of reality. Like most studies that are based on a high number of observations and analyses at the population level, this study is limited in that it does not explore in depth the mechanisms that entail causality. The interpretation of results rests largely on theories and assumptions made by others in the specific field of research. It is, thus, appropriate to conclude this thesis not simply with the contribution of the findings, but by taking a step back and discussing how both the findings and the limitations can contribute to setting the agenda for future research.

3.4 Avenues for future research

This thesis raises more question than it provides answers. It shows that the effects of cooperation are not universal but depend on various factors. It does this by nuancing a few characteristics linked to the organizational form, tasks, and performance of cooperation. All these dimensions have potential for development. As pointed out in article IV, "The conclusion that administrative services characterized by a low need for geographical proximity, asset specificity, frequency and complexity are more suitable for contracting needs further empirical scrutiny." The validity of this assumption needs to be further tested by studying other types of shared administration. There is also a wide variety of service areas in which cooperation is widespread, but in which scale benefits cannot be expected as seen through this framework. This is the case in health and social services characterized by high geographically dependence (Zeiner & Tjerbo, 2014). There is also a need for further development of performance measurement. Reviews of the empirical field calls for broader measurement of performance; this may also cultivate a deeper understanding of the effects of cooperation in both the service areas analyzed in this study and others (Aldag et al., 2020; Bel & Sebő, 2021). IMC is a field in which empirical contributions on effects are lacking.

Future studies can also benefit from greater implementation of the aspect of time in their analyses. As previously stated, this is not a study of organizational change. The analyses herein more or less take 'still pictures' of the effects at certain points in time. This is not only challenging because it does not capture the before-and-after transition from one organizational form to another. It also does not take into account the fact that organizations and their ability to perform may evolve over time (Meyer & Zucker, 1989). If the phenomenon is examined through literature on organizational change, it could be argued that change, in itself, demands extra capacity, and that an increase in performance can only be expected once all new elements have been established over time (Jacobsen, 2021; Meyer & Stensaker, 2006). Both establishing and negotiating contracts and

creating a new organization may demand more resources in the beginning. Due to lack of data, this study does not incorporate how the duration of cooperation might affect performance. There is literature explaining the factors that determine the duration of shared service delivery (Aldag & Warner, 2018), but studies explaining whether and how the duration of cooperation affects performance are lacking.

A related issue is whether transaction costs are affected by the duration of cooperation. Another important question is what actually defines transaction costs in the IMC setting. In many studies of the effects of IMC, transaction costs can be viewed as something similar to a black box. Cost is empirically measured as unit prices, total costs for municipalities, or cost per capita (Bel & Warner, 2015b). Additionally, potential cost increases/decreases due to cooperation (all else being equal) are interpreted as lowering or increasing transaction costs. The empirical field can benefit from future studies that further examine the actual content of cooperation costs. The Norwegian context demonstrates that cooperation demands various forms of political supervision. The use of ownership strategies (*eierskapsstrategi* and *eierskapsmeldinger*) enhances political control (Leknes et al., 2013). It does, however, imply extra work that may not be sufficiently captured in the service-specific cost measurements. One way of detecting these types of cooperation costs is to use a more inductive approach and conduct more in-depth studies of the mechanisms of cost. In a European setting, cooperation varies when it comes to scope; some cooperations include one service while others include a range of services (Hülst et al., 2009; Teles, 2016). Norwegian, German, Finnish, and Belgian shared service delivery are mostly characterized by being unifunctional (single services), in contrast to, for instance, Italy, the Netherlands, Portugal, and France, where it is more common for cooperative arrangements to be multifunctional (Bel et al., 2022; Teles, 2016). From the previous theoretical considerations and recent reviews of the literature, it can also be asked whether the running of multifunctioning cooperation could reduce the number of cost- driving arenas and transactions

(Bel et al., 2022).

Increased knowledge on the cost-driving features of cooperation has both academic and practical relevance. This includes increasing empirical understanding of the possible effects of trust, shared values and norms, and social networks, etc., on transaction cost (Bel & Warner, 2015b). This thesis claims that a low number of cooperating partners, for reasons of efficiency, can rely on trust and thus on simpler structures, while greater numbers need to create more formalized structures. This claim must be further analyzed, both in dept and in a broader set of contexts. Additionally, features explaining the conditions for the success (or failure) of a cooperation should not be restricted to comparing cooperations but may also include features of each member. This taps into a question that is not analyzed in this thesis but is discussed in the literature (see Arntsen, Torjesen, & Karlsen, 2020; Camões, Tavares, & Teles, 2021), namely, are some municipalities a better fit for each other than others? Do some features (and combinations of features) make cooperating partners achieve better performance? This can refer to similar political orientation, common labor market areas, spatial factors, or overall integration of the cooperating region (Okuda & Thomson, 2007; Oudin, Andréassian, Perrin, Michel, & Le Moine, 2008). Another significant factor in determining effects that has not been examined in this thesis is the question of how costs and benefits are distributed among members (Provan et al., 2008; Scheer, Kumar, & Steenkamp, 2003). The question of *cui bono* (who benefits) has been a classic issue within the field of political science (e.g., Blau & Scott, 1962; Dahl, 1963), but lacks empirical scrutiny (Jacobsen, forthcoming). As discussed earlier and pointed out by Bel and Belerdas-Castro (2021), "intermunicipal cooperation can be more beneficial for smaller municipalities, as these suffer most acutely from suboptimal size". It can be expected, then, that small municipalities will benefit from scale economies, while the larger ones that have realized these benefits may to a higher degree experience the (transaction) costs related to cooperating (Bel & Warner, 2015b). This claim is supported by the literature (Bel & Costas, 2006), but can

benefit from further empirical investigation. Future studies should also broaden the concept of benefits and examine who is likely to benefit most and who least from cooperation (Reinalda & Verbeek, 2003 p. 216).

One of this thesis's central findings is the effect of cooperation size. The number of cooperating members has a significant effect in all four studies. Comparable international studies are, however, largely lacking. Number of members impairs cost efficiency in Sørensen (2007) (Norway), cooperation 'intensity' (Camões et al., 2021) (Portugal), and the possibility of reaching agreements (Wilson, 2018) (Albania). There is a need for further empirical evidence on what and how general conditions determine the extent of the multiple principal problem. Is the effect of cooperation size dependent on other demographical or institutional features in different national contexts? The question of integration of the interorganizational relation (joint contract or joint organization) also needs to be expanded, in terms of both the service areas and national contexts examined. The variations in institutional settings for IMC have increasingly caught the attention of scholars (Bel et al., 2022). The effects extracted from this thesis show that the distinction between cooperation with and without its own organization is of significance for cooperations performance and should be further studied in the European context. The institutional similarities in many European countries provide a fruitful avenue for international comparative research.

Another question that this thesis discusses but does not answer adequately is the question of possible trade-offs. This is not a new question (Dahl & Tufte, 1973), but one that social scientists struggle with finding appropriate ways of addressing (Bel & Sebő, 2021). In the performance literature, this question can be spotted in critical assessments of whether one type of performance displaces another (Brignall & Modell, 2000; Van Thiel & Leeuw, 2002). Some even approach this question by stating that practitioners should "be careful what [they] wish for" (Phan, Siegel, & Wright, 2016, square brackets my own). Narrowing focus to a few specific goals may thus lead to unintended and negative consequences for other dimensions of performance. Future studies should dig deeper into this

problem not only by measuring performance 'all else equal,' but also by capturing the actual trade-off using multiple dependent variables in an integrated analysis. To what degree, if any, does the achievement of one goal suppress another? There is also a need to broaden understanding of possible trade-off effects. What are the goals and implications of cooperation, and how do they play out against one another? Municipalities are political organizations. They thus have a clear democratic dimension, and possible trade-offs do not only apply to what degree an increase in quality may eat of the potential cost benefit. Possible questions about trade-offs should also include, in the tradition of Dahl and Tufte, the democratic effects of cooperation. The four studies that form the basis for this thesis show that cooperation is not a universal solution to enlarging system capacity. The next question, then, is how the effects of cooperation on the service production variables play out against citizen effectiveness. Studies of democratic governance include terms such as *citizen effectiveness*, *accountability*, *transparency*, and *responsiveness*. Future studies should tap further into the possible trade-offs between system capacity and citizen effectiveness, questioning whether there exists a trade-off or whether cooperation either promotes or impairs both.

The effects of cooperation (intended or unintended), i.e., the concepts researchers should study, should also not be regarded as exhausted. What researchers are increasingly arguing is that cooperation is a complex phenomenon, in both its goals and its institutional features. Determining the effects of cooperation should not rest on established theoretical concepts alone but should also be subjected to in-depth inductive studies in order to shed light on what cooperation is meant to accomplish (and who defines this).

In summary, there is a need for research on a broad number of effects, and a need to dive deeper into defining what these effects are (both the positive and the negative), how they play out against one another, and what the mechanisms make them play out in the particular ways in which they do. The IMC research agenda is, of course, much broader than what has been outlined here, and is described in

much broader terms in more substantial overviews of the field (Jacobsen, forthcoming; Teles, 2016; Teles & Swianiewicz, 2018). The present outline is based on reasoning from work on three specific services in one national context. Even so, it coincides with the work of other scholars in painting a picture of the future of research on the effects of IMC as a wide-open landscape.

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APPENDICES

Appendix 1: Organizing of inter-municipal cooperation in Norway.

	with IMC-organization			without IMC-organization[1]
Legal framework of Norwegian IMC	Inter-municipal companies[2] (limited liability)	Inter-municipal companies[3] (unlimited liability)	Task communities[4] ("Oppgave-fellesskap")	Inter-municipal contract ("Host" municipality cooperation[5])
Most important by dimension	Uses the same legal framework as private companies	Most widespread legal form	New form that (together with the other categories) replaces the former inter-municipal boards ("§ 27-samarbeid")	For tasks that require delegation of authority to exercise legal decisions towards individuals "enkeltvedtak" (such as decisions in child protection services) delegation through the "Host municipality cooperation" is (if not specified by specific law) the only legal form of IMC
Public or private law	Private	Public		
Right to raise fees?	Yes, if allowed by statutes			No
Disclosure obligation / external auditing	No	Yes		
Covered in official statistics[6]	Yes		No	
Typical Mode of public service production	Joint provision			Delegation of task
Joint governance or delegation of governance	Joint governance			Delegation/one member responsible for service provision
Typical fields of use[7]	Auditing, waste-disposal	Auditing, waste-disposal, fire services, water-management	Legislated in 2020. No data available	Accounting, child protection, fire services, agriculture management
Governance	The member municipalities hold shares and exercise	The company form mandates distinction between	In this model members may choose to only	Municipalities (the members) agree with another

	their authority through the "Annual General Meeting" ("Generalforsamling)", which is the company's «supreme body»	owners (supervisory board), executive board and general manager. Each municipal council appoints their own representatives (the supervisory board) who appoints an executive board consisting of minimum three members	appoint a supervisory board who represents both owner- and "task community" (executive) interests	municipality (the host) that this municipality shall perform tasks and make administrative decisions on behalf of members.

Retrieved from Germa Bel et al. (2022), online appendix

[1] Municipalities also purchases services from other municipalities by contractual agreements (private law). The scope of these agreements is difficult to map (Leknes et al., 2013). They are by the Norwegian Ministry of Local Government and Modernisation not defined as cooperation but purchase and sale of services between municipalities (Ryssevik & Jones, 2020). Even though the practical differences between these contracts and administrative host municipality cooperation may be discussed (D. I. Jacobsen, Forthcoming), we have chosen to leave these agreements out of the main organizational forms of cooperation.

[2] This form also allows for public-private ownership. Former studies estimate approximately 27 percent of all IMC is organized as inter-municipal companies with limited responsibility (Leknes et al. 2013).

[3] Estimates show that this form constitutes 32 percent of the total number of IMCs (Leknes et al. 2013). To what extent the two company forms listed in this table differs in democratic influence have been subject to discussions in the legal field (Høivik, 2005).

[4] "Task communities" does in principle not have to create its own legal status, as opposed to inter-municipal companies and firms who always are own legal entities. This makes this legal form non-consistent with the definition of IMC-organizations as own legal entities.

[5] The municipal act opens up for both administrative host municipality cooperation and a Host municipality cooperation with a joint elected political committee. The latter model means delegating political power to the IMC- and therefore creation of a «interface board» - which puts this type of «Host» municpality cooperation closer to an IMC with IMC-organization. This form of cooperation is however seldom used for shared service provision and is therefore not treated as one of the main legal forms in this presentation. Leknes et al. (2013) estimated that administrative host municipality cooperation constituted 16 percent of all IMCs.

[6] Yes = registered in the Norwegian business- and enterpriseregister, «Brønnøysundsregisteret»

[7] Based on data from the Database for Municipal organization («Organisasjonsdatabasen») managed by the Norwegian Ministry of Local Government and Modernisation, reported in: (Blåka, Tjerbo, & Zeiner, 2012; Monkerud et al., 2016). These two reports show that tasks characterized with high asset specificity such as waste disposal (84 percent) and need for redundancy such as emergency primary care (70 percent), crises centers (78 percent) and fire services (50 percent) are commonly subject to cooperation. This also apply for administrative tasks such as accounting (80 percent) and IT-services (48 percent).

PART II

RESEARCH PAPERS

Blåka, S. (2017). "Does cooperation affect service delivery costs? Evidence from fire services in Norway." Public Administration 95(4): 1092-1106.

Blåka, S. (2017). "Service Quality, Inter-municipal Cooperation and the Optimum Scale of Operation: The case of local fire departments in Norway. In Trondal J. (ed.). The Rise of Common Political Order Institutions, Public Administration and Transnational Space. Edward Elgar Publishing

Blåka, S., D. I. Jacobsen and T. Morken (2021). "Service quality and the optimum number of members in inter-municipal cooperation. The case of emergency primary care services in Norway." Public Administration: 1-16.

Blåka, S. (under review) "Does cooperation affect service delivery costs? Privatization, cooperation, and the optimum number of members in Norwegian local auditing services."

PAPER I

WILEY pa public administration

ORIGINAL ARTICLE

Does cooperation affect service delivery costs? Evidence from fire services in Norway

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The objective of this study is to develop our understanding of how cooperation between local governments affects service delivery costs. The current study provides three contributions to the existing literature: (1) we assess the relation between inter-municipal cooperation and service delivery costs for fire services; (2) we evaluate whether different forms of cooperation affect costs differently; and (3) we analyse how the number of cooperation partners affects the cooperation–cost relation. Theoretically, it is argued that cooperation promotes scale economies, but that increasing transaction costs from additional cooperation partners may outweigh these potential benefits. The data show that there are significant economies of scale linked to cooperation, but that this depends on the organizational form of the cooperation as costs are lower for contractual agreements than for joint organizations. Furthermore, cost benefits decrease significantly as the number of cooperation partners increases, and more so for contractual agreements than for joint organizations.

1 | INTRODUCTION

Local authorities in Europe play a central role as providers of public services. Over recent decades, these authorities have also faced higher requirements to produce cost-effective and high-quality services due to both political and economic pressure (Hulst and Montfort 2007b; Hulst et al. 2009). Meeting these demands has been a challenge, especially for the many small municipalities in most European countries, as they struggle with factors such as small-scale economies and attracting high competence personnel (Hulst and Montfort 2007a). One common solution to these problems is to increase municipality size through amalgamations, although empirical studies show mixed results for their effect on service delivery costs (Bish 2001; Carr and Feiock 2004; Dollery and Johnson 2005; Fox and Gurley 2006; Holzer and Fry 2011; Blom-Hansen et al. 2014; Bel and Warner 2015, p. 52). Another proposed policy option is privatization or outsourcing of public service delivery. Here, as well, the results from empirical research are mixed, as many small municipalities find that increasing transaction costs outweigh efficiency gains in the production of services (Bel and Miralles 2003; Bel and Warner 2015, p. 55).

A third strategy to cope with these challenges—and the one central to this study—is inter-municipal coopera-tion, which is often presented as something that potentially combines the best of two worlds (Hulst and Montfort 2007b). On the one hand, joint provision of services is a way to create economies of scale and increase service qual-ity (Hulst and Montfort 2012, p. 122). On the other hand, the original municipal structure with many small units is maintained, thus making it possible to reap the democratic gains of small communities (Baldersheim and Rose 2010). Empirically, we have witnessed an increase in both the amount and organizational variety of inter-municipal cooperation for producing public services and managing trans-boundary problems (Hulst and Montfort 2007b; Bel and Warner 2016).

Even though inter-municipal cooperation has a long history (Ostrom et al. 1961) and is used by municipalities worldwide, the literature remains inconclusive concerning its effects on service production and operating costs (Bel and Warner 2015, p. 53). Bel and Costas (2006), Bel and Mur (2009), Dijkgraaf and Gradus (2013), Bel et al. (2014) (Spain) and Zafra-Gòmez et al. (2013) (the Netherlands) find that cooperation induces cost savings, while Sørensen (2007) (Norway) and Garrone et al. (2010) (Italy) find the opposite result. However, all listed studies focus on solid waste collection (except for Garrone et al. 2010 who also include water and energy), and empirical data from other service fields is largely missing. In addition, we lack multivariate empirical studies assessing the connection between the exact organizational form of cooperative arrangements and service delivery costs (Bel and Warner 2015; Hulst and Montfort 2007b). This article contributes to filling these knowledge gaps by studying how distinct forms of inter-municipal cooperation affect costs in a service field that previously has received little attention (i.e., fire services).

This study addresses three specific research questions. First, is inter-municipal cooperation a less costly way of fire service delivery than the hierarchical mode (single municipality)? Second, do distinct forms of inter-municipal cooperation—that is, joint organizations and contractual agreements—affect service delivery costs differently? Third, how does the size of the cooperative arrangement (i.e., number of members) affect service delivery costs?

2 | INTER-MUNICIPAL COOPERATION AND COST

Inter-municipal cooperation can be defined as a form of inter-organizational relations, which includes two or more municipalities that pool their resources to solve a common task or challenge (Jacobsen 2014a, p. 15, see also for instance Bel et al. 2014; Hulst and Montfort 2012). The municipality thereby represents the organizational level—they are either single producers of services or members of a cooperative arrangement jointly producing services. Interest in inter-organizational relations and entities is hardly a new phenomenon. It 'has existed for as long as there have been identifiable organizations to relate to each other' (Cropper et al. 2008, p. 6). Their form may vary from alliances between organizations to the creation of new companies with shared ownership (Cropper et al. 2008). What unifies inter-organizational relations research is that 'in one way or another, it focuses on the properties and overall pattern of relationships between and among organizations that are pursuing a mutual interest while also remaining independent and autonomous, thus retaining separate interests' (Cropper et al. 2008, p. 9).

A common theoretical explanation for the creation of inter-organizational relationships is that cooperation is a result of strategic choice (Powell 1990). An organization will enter into inter-organizational relations if it expects that the benefits of doing so exceed the costs. These benefits are often argued to derive from economies of scale (Hirsch 1959; Powell 1990). Challenges related to returns on scale and sub-optimal jurisdiction size are common problems in government-provided services (Lage-Penas and Martinez-Vazquez 2013). The general argument is that small production, which is closely related to small size, may lead to spare capacity and thus higher unit costs. Pro-duction units of larger size may exploit their equipment capacity better than smaller units. This would lower produc-tion costs for municipalities that create joint service provision (Brown and Potoski 2003). In that sense, economies of scale are closely linked to cost efficiency, since the average production cost per unit decreases as production increases (Feiock 2007; Douma and Schreuder 2008; Bel and Warner 2015, p. 7).

There are, however, clear limitations to the benefits available via economies of scale. The most obvious is the size of the participating municipality (e.g., Petersen et al. 2015). While many European municipalities are (very) small, some may be large enough to realize scale benefits even if they do not cooperate. From a rational point of view, such municipalities would be likely to abstain from cooperative arrangements. Yet, they may also participate in such arrangements for other reasons (gaining goodwill, accessing other benefits, altruistic motives, etc.) (Hulst and Montfort 2007b; Jacobsen 2014b; Bel and Warner 2016).

Nonetheless, what matters for organizational efficiency is not just to minimize production costs, but the sum of production costs and transaction costs (Williamson 1991). Transaction costs can be defined as 'comparative costs of planning, adapting and monitoring task completion under alternative governance structures' (Williamson 1996, p. 142). Transaction cost theory (Williamson 1975, 1985) has had a major influence on studies of inter-organizational relations (Barringer and Harrison 2000; David and Han 2004; Hennart 2008) and is widely applied in analyses of local government service production (e.g., Brown and Potoski 2003; Lamothe et al. 2008; Warner 2011; Hefetz and Warner 2012; Hefetz et al. 2012; Petersen et al. 2015). Such empirical studies show that inter-organizational agreements may decrease production costs, but at the same time generate 'cooperation costs' that single organizations are less exposed to. These costs are related to general aspects of cooperation such as information sharing, negotiation and monitoring (Feiock 2007; Bel and Warner 2015). Hulst et al. (2009, p.270) elaborate on this by stating that:

> cooperation itself also brings along extra costs compared to service delivery by individual local governments. In most of the countries included in our sample the establishment of a joint organization requires drawing up statutes that contain provisions concerning its aim, the decision-making authority attributed by the municipalities, the governing bodies, the funding of the organization, the modification of the statutes and the dissolution of the organization, amongst others.

The creation and survival of cooperation is dependent on the partners' ability to coordinate and divide tasks and costs when all partners are autonomous actors. This type of political interaction is always costly (Tavares and Camões 2007, p. 538). Cooperation makes it necessary to create new political arenas that single municipal service providers do not have to establish. When we consider these transaction costs related to cooperation, the question becomes whether and when such costs may exceed the economic benefits of cooperating (i.e., from economies of scale).

Extending the transaction cost perspective, one may also argue that some types of service would benefit more from larger scale than others. First, different municipal services will display distinct characteristics in terms of asset specificity and hazards of probity (Williamson 1979, 1999). Asset specificity refers to what degree investments in capital goods (for instance, buildings, machines, helicopters, etc.) and specialized personnel can be exploited beyond the specific service field (Brown and Potoski 2005). Hazards of probity refer to the need for fail-safe service delivery. Some public services—such as fire services and disaster management—simply must not fail, and municipalities will therefore need to provide capacity (capital goods and personnel) that on a regular basis will be layed off (Warner 2011, p. 425). High degrees of asset specificity and the need to provide excess capacity is costly, and represents a clear incentive to cooperate to share costly investments (Williamson 1999), even for larger municipalities (Brown and Potoski 2003).

Second, some municipal services may be costlier to monitor than others. One challenge when studying public services in general is that it is difficult to establish a clear standard on what constitutes both correct processes and outcomes (Provan and Milward 2001). This is even more true when studying highly complex service provision such as child welfare (Jacobsen and Kiland forthcoming) or mental health (Provan and Milward 1995). Services where it is difficult to establish clear, measurable standards present a high degree of uncertainty to participants, in turn spurring more time and resources for discussing what indicators should be used, handling divergent views among participants, resolving conflicts, as well as renegotiating contracts. As a consequence the economic benefits of cooperation are most likely to outweigh transaction costs of cooperation in service fields where some objective or commonly accepted standards for 'good work' can be elaborated.

3 | FORM AND SIZE OF COOPERATION

Variation in the actual organization of cooperative arrangements has attracted a lot of attention within the framework of inter-organizational relations (Cropper et al. 2008; Sandfort and Milward 2008). A common distinction is drawn between contractual agreements (i.e., a buyer–seller arrangement) and joint organization (i.e., an autonomous organization with joint ownership) (Dancin et al. 2008; Sandfort and Milward 2008). These cooperative arrangements are not only different from ordinary in-house municipal production and provision of services, but are also very different from each other. That is, even though these organizational forms are often empirically lumped together in the same category of 'cooperation' between hierarchy and market (Williamson 1991), they represent highly distinct modes of governance. The question then arises whether such distinct types of inter-organizational relations affect service delivery costs differently.

Under contractual arrangements, the production and provision of the actual service takes place within the framework of a single organization (i.e., a municipality) characterized by hierarchical relations. Thus, no new organization is created. Still, the hierarchical leader with responsibility for the service within each municipality will have to relate to several contract partners, not only to the administrative and political principal in one municipality. Under joint organization, the service is provided by a single organization with its own resources and capacities. This organization is usually a legally autonomous unit, managed by a hierarchical leader subordinated to a board consisting of representatives from the participating municipalities (Hulst and Montfort 2012; Bel and Warner 2015).[1]

A contractual cooperative agreement between municipalities in practice often means contract-based purchase and sale of services between municipalities. Such cooperation may be considered as resembling a market relation (in line with Williamson 1975). What differentiates this form of cooperation from joint organizations is mainly that the latter are characterized by a symmetric relationship between all members. Instead of delegating responsibility by buying services, members create joint organizations where control and management is executed through ownership—hence placing it further away from a market relation, but not as far as a hierarchical relationship.

From a transaction cost perspective, the creation and operation of new joint organizations may generate higher costs than contractual agreements. Even though both contractual agreements and joint organizations require resources linked to information, negotiation and monitoring (Feiock 2007), creating and operating a joint organization furthermore involves costs linked to hiring administrative personnel and management. It also requires gathering an assembly of representatives and boards—which means that each municipality needs to provide and pay suitable directors and other board members in new political bodies (Hulst and Montfort 2012; Jacobsen 2014a). This does not apply in the same sense to contractual agreements, where these tasks are integrated in already existing organizations—the member municipalities. One can therefore expect that municipalities that choose to organize their cooperation as new formal organizations face higher transaction costs than municipalities creating contractual agreements—all else being equal.

Finally, one may expect that transaction costs depend on the number of cooperating organizations. First, more cooperation partners are usually associated with higher complexity, increasing the need for coordination and political interaction (i.e., more people who will have to agree), which in turn will raise transaction costs (e.g., Feiock 2007; Tavares and Camões 2007). Second, classical contributions in organization theory (Mintzberg 1979) state that the greater size of an organization is generally linked to increased formalization. This again tends to induce higher transaction costs. We should, however, also be open to the possibility that the effect of the number of cooperation partners depends on the organization of the cooperative arrangement. As noted earlier, setting up a joint organization is a costly affair, and these transaction costs may become high per cooperation partner when there are only two or

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[1]One may argue that joint organization leads to a relatively independent new organization, and thus reflects a form of integrated service delivery rather than cooperative service delivery. Yet, it is important to keep in mind that the relevant level of observation in our analysis is the cooperation partner (i.e., the municipality). This is important since under independent service delivery, integration takes place at the level of the municipality, while with joint organization it takes places at a level above the participating municipalities. As such, joint organization may best be viewed as a cooperative form of integrated service delivery.

a few members to share them. In contrast, it will be less costly to draw up a contract between two or a few partners. Nonetheless, once a joint organization is set up, it will represent a rather stable framework where accommodation of new participants might be quite easy. As the number of participants increases, however, contracts will become ever more complex to draft and monitor, implying increasing transaction costs associated with cooperation size.

4 | THE CASE OF FIRE SERVICES

As noted above, different services will have different cost functions as well as distinct characteristics concerning asset specificity, hazard of probity and measurability of processes and outcomes. Bel and Warner's (2015) review of empirical contributions on cooperation's effects on cost shows that most studies analyse solid waste collection, while other sectors are largely lacking. This study focuses on fire services. Fire services are different from solid waste collection along several dimensions. First, emergency services are characterized by uncertain and fluctuating demand (Hagen 2009; Blåka et al. 2013), and leave no room for failure. Both elements require providing the laying-off of both expensive capital goods and highly specialized personnel on a regular basis. This is unlike solid waste collection, where one can more easily plan utilization of capacity well in advance (Warner 2011, p. 425).

Second, Hulst et al. (2009) and Bel and Warner (2015) argue that in many cases local government services are highly dependent on geography (i.e., physical distance). Fire services are good examples of this. In most European countries, fire services need to comply with regulations concerning localization of response forces at a maximum distance from populated areas to guarantee a certain response time (Hulst et al. 2009). Unlike solid waste collection, this creates limitations when it comes to geographical distribution of services and thus the scale of optimal operation.

One could also argue that it is more difficult to measure both processes and outcomes of fire services than solid waste collection (Williamson 1979, 1985). Feiock (2007, p. 53) argues explicitly that fire services will generate higher transaction costs than solid waste collection because of the measurement difficulties associated with fire services. Brown and Potoski (2005, p. 327) also state that 'the costs of negotiating, implementing, monitoring, and enforcing contracts are higher when services have outcomes that are difficult to measure and when services require asset specific investments'. In these cases, the contract management costs and the heightened risk of failed contracts may outweigh their potential benefits (Brown and Potoski 2005). While it is relatively easy to identify units produced within solid waste collection (number of garbage cans to be collected, number of kilometres on each route, etc.), the units are more difficult to delineate when it comes to fire services. How should one determine, for instance, how much one unit of fire prevention is, or how much it should cost (e.g., Feiock 2007)? Thus, it is possible that transaction costs associated with cooperation over fire services may be higher than for solid waste collection.

Finally, fire services are interesting objects of study in themselves as earlier studies show that this is a task often organized as cooperation between municipalities in countries all over the world (Honadle 1984; Dollery and Akimov 2007; Hulst and Montfort 2007b; Hulst et al. 2009). A traditional and commonly used way of organizing the cooperation is to perform fire communications cooperatively, while each municipality maintains its own fire department (Honadle 1984). The above studies of cooperation on fire services do not, however, go beyond mapping the existence of cooperative arrangements.

5 | THE EMPIRICAL STUDY

The empirical case in this study is fire services in Norway, which is a country with about 5 million inhabitants living in 428 municipalities. The dispersed settlement and variation in population size as well as the demand that municipalities produce equal services creates challenges when it comes to their ability to deliver public services at a sufficiently low cost. This has over the years led to an increase in formalized cooperation between municipalities

(Jacobsen et al. 2011; Jacobsen 2014a). Mappings of the scope of cooperation between Norwegian municipalities show that accounting, ICT, solid waste disposal, emergency care and fire prevention are the sectors where cooperation is most widespread. Among these, local fire services are among the services with the highest organizational diversity (Blåka et al. 2012). Currently, over 60 per cent of Norwegian municipalities provide fire services in cooperation with other municipalities. This cooperation takes place in a variety of ways, but one basic distinction, also used in the theoretical discussion, is between cooperation as joint organizations and as contractual agreements (Jacobsen 2014a; Vinsand and Langset 2014).

Our empirical model linking cooperation to service delivery costs is specified as follows (with subscript i for municipality):

$$Cost_i = a + b_1 Coop_i + [b_2 CoopNumber_i +] b_3 Controls_i + e_i.$$

The dependent variable ($Cost_i$) follows the standard approach in the literature to look at total operating costs for fire services per capita (Holzer and Fry 2011). Included in these total operating costs are costs associated with sweeping chimneys and other actions to prevent fires and explosion accidents, as well as costs for emergency preparedness for fires and other accidents (Statistics Norway 2013, p. 38). This reflects the fact that tasks provided by local fire departments are subject to extensive state regulation and consist primarily of emergency work and fire prevention (Norwegian Ministry of Justice 2012). Fire prevention means that the municipalities are responsible for providing information for the public, conducting inspections to prevent fire and sweeping inhabitants' chimneys. Emergency work means that the local fire departments act as response force in case of fire or accidents (Norwegian Ministry of Justice 2012).

One weakness with using operating costs as the dependent variable is that it does not directly capture transaction costs. Unfortunately, we do not have cost measurements directly related to political and administrative transactions at the service level, only at the municipal level. Yet there is a very high and significant correlation between operating costs in fire services and general political and administrative costs (0.5 and 0.6), which mitigates potential concerns about our cost measure. Even so, the results should be interpreted with this measurement weakness in mind. Another factor of importance is how expenses are divided between cooperating members. In contractual agreements, this is not a problem because the municipalities operate with cost numbers at the municipal level. Yet in joint organizations these numbers are aggregated to the cooperation level. Here we rely on calculations made by Statistics Norway, who use each cooperating municipality's stake/shareholding in the organization to calculate operating costs.

The independent variables of central interest—$Coop_i$ and $CoopNumber_i$—measure the extent of cooperation engaged in by municipality i. Cooperation organized as joint organizations is operationalized by including all cases where municipalities create companies with limited liability and shared ownership or set up inter-municipal corporations with unlimited liability for the owner municipalities. We also define cooperation as a joint organization if members establish a joint board that represents all participating municipalities (see Jacobsen 2014a for further elaboration). Contractual agreements, instead, are operationalized as the absence of a joint ownership structure for cooperation. This is the case if municipalities develop some sort of purchase or sale agreement, or they choose to delegate the operational responsibility for a service to a host municipality (Jacobsen 2014a; Vinsand and Langset 2014). Using these operationalizations, the different aspects of inter-municipal cooperation are coded as follows:

1. Cooperation versus non-cooperation ($Coop_i$): Municipalities that have organized fire services as inter-municipal cooperation (any form) are given the value 1, while municipalities providing services on their own are given the value 0.
2. Cooperative form (alternative specification of $Coop_i$): Two dichotomous variables are constructed: (a) Municipalities that organize their fire services as joint organizations are given the value 1, and all other municipalities the value 0; (b) Municipalities that organize their fire services as contractual agreements are given the value 1, and all other municipalities the value 0.

3. Cooperation size (*CoopNumber_i*): The number of municipalities in the inter-municipal fire service cooperation. Municipalities that provide fire services on their own (do not cooperate) are given the value 1, while the municipalities that cooperate with one other municipality are given the value 2, and so forth.

Data collection was initially based on mappings found at the Norwegian Directorate for Civil Protection.[2] This database includes inter-municipal companies providing fire services as well as some joint boards and agreements of shared service delivery. For the municipalities that are not registered in this database (258 municipalities), data were collected by visiting each municipality's web page. The municipalities that described how they organize their fire services and did not state that they cooperate with other municipalities were registered as non-cooperative municipalities. Municipalities without information about the organizational form of their fire services on their web page were contacted by email (local fire chief). The ones that did not respond to this email were contacted by phone. In the end, information on cooperation in fire services was obtained for 427 out of 428 Norwegian municipalities.

The set of control variables (*Controls_i*) includes a measure of actual workload, which is of great importance for actual spending. A commonly used output measure in fire services is the number of call-outs (Found 2012). This—fires and fire alarms—is the activity with the strongest consequences for fire service costs, as having firefighters on assignments is more expensive than having them on call. The number of call-outs is thus included as a control for output in our analysis. In addition, total costs are also tightly connected to the quality level of the fire services in a municipality, as some municipalities may choose to provide, for instance, preventive fire services above the minimum legal norms (Kelly and Swindell 2002). To capture these cost-driving factors, we control for indicators of service quality such as the competence level of staff (the percentage of employees with the necessary competence to supervise specific objects), sweeping rate (chimneys swept as a percentage of total chimneys in the municipality), and inspection rate (number of public buildings inspected as a percentage of total buildings in the municipality).

Fire service costs will also be affected by local variations between municipalities. Even though municipalities are subject to the same regulations, they operate under various demographic conditions that may affect fire service delivery costs independent of how they choose to organize their fire services. One relevant aspect thus is that Norwegian municipalities differ widely in population size (ranging from about 200 inhabitants in Utsira to more than 600,000 inhabitants in Oslo).[3] As larger municipalities will have better opportunities to exploit economies of scale, service delivery costs will depend on the size of the municipal population (Deller 1992; Ladd 1992; Petersen et al. 2015). We thus control for number of inhabitants in the municipality (log transformed). The cost of fire services may also depend on the density of population (number of inhabitants per square kilometre) and physical area (square kilometres) because fire departments have a specified compulsory response time to attain. More densely populated municipalities and a larger physical area of the municipality imply that more fire services must be geographically distributed, which increases costs. Finally, a municipality's general economic situation may affect fire service delivery costs. Wealthier municipalities have more resources that they can use in service provision, and thus can provide services of better quality to their citizens than poorer municipalities. We operationalize this via the so-called 'free income per capita', which is computed by Statistics Norway as the amount of money a municipality 'has left' when all mandatory services have been provided at the minimum specified quality level.

Before turning to the results, we will draw attention to an important methodological concern when estimating the effect of cooperation on service costs: the problem of endogeneity (e.g., Bel et al. 2014; Geys and Sørensen 2016). We hypothesize that cooperation will affect costs, but we cannot exclude the possibility that costs may also affect the decision to cooperate. This represents a possible reverse causality problem. One way of dealing with this

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[2]http://kart.dsb.no/default.aspx?gui = 1&lang = 2

[3]On average, Norwegian municipalities have almost 12,000 inhabitants, but over half of the municipalities have fewer than 5,000 inhabitants. From a European perspective, this variation in population size is not excessive. For instance, municipal population sizes in Spain and France span from small two-digit figures to cities with millions of inhabitants. These enormous differences may make comparison of our results with such countries difficult. Even though the number of inhabitants is used as a control variable, all comparisons between countries should be done with this variation in mind.

problem is to use an instrument variable approach (Bel et al. 2014, p. 98). This effectively requires the estimation of two regression models. In a first stage, we regress the possibly endogenous cooperation variables on a set of instruments. These instruments should be sufficiently strongly correlated with the independent variables, but should not be correlated with the error term (see also Geys and Sørensen 2016).

$$Coop_i = \alpha + \beta_1 Instruments_i + \beta_2 Controls_i + \varepsilon_i$$

$$CoopNumber_i = \gamma + \delta_1 Instruments_i + \delta_2 Controls_i + \vartheta_i$$

Then, in a second stage, we insert the predicted values of the first-stage regression instead of the original cooperation variables.

$$Cost_i = a + b_1 \widehat{Coop}_i + \left[b_2 \widehat{CoopNumber}_i + \right] b_3 Controls_i + e_i$$

We rely on four instruments for this analysis: (1) Historical change in the municipality's administrative structure. This indicates how willing the municipality is to adapt to organizational changes. Under the assumption that municipalities making such changes have a stronger capacity for novel organizational forms, they can be expected to have a higher probability of entering into inter-municipal cooperation (e.g., Meyer and Stensaker 2006). (2) Voter turnout at the last municipal election. This is a measure of inhabitants' engagement in local affairs. Higher engagement strengthens citizens' scrutiny over municipalities' activities, which is likely to provide a stronger incentive to find cooperation partners to reduce costs. (3) The latitudinal position of the municipality. Municipalities located in northern Norway generally have poorer infrastructure and face larger distances between establishments, which makes cooperation more difficult (Blåka et al. 2013). (4) Historical population growth in the period 1995–2009. Faster population growth arguably strengthens the need for cooperation to ensure that municipalities can maintain their operational capacity. The first stage results, not shown here for reasons of space, indicate that all instruments prove to be statistically significant in the hypothesized direction (details upon request).

Table 1 provides an overview of the variables used in the analysis (including the instruments) and their summary statistics.

6 | ESTIMATION RESULTS

Table 2 summarizes the results for five regression models (always estimated using 2SLS to accommodate potential endogeneity). Model 1 simply estimates the general effect of cooperation on operating costs per capita. Model 2 further introduces the number of cooperation partners. Model 3 then distinguishes between different forms of cooperation, whereas models 4 and 5 again add the number of participants in the respective cooperative arrangements. Throughout the analysis, non-cooperating municipalities constitute the reference category. Note also that the number of cooperation partners ($CoopNumber_i$) can only be positive when cooperation is present ($Coop_i = 1$) (see above). Hence, when both variables are included in the same regression model, their coefficient estimates cannot be interpreted in isolation. To clarify this joint interpretation, we will show graphical representations of the marginal effect of adding additional cooperation partners on operating costs.

The results for model 1 show that cooperation in general does not have a statistically significant effect on service delivery costs. Yet, this model represents the average effect of cooperation, and thus does not take into account potential variation due to the number of cooperation partners. Model 2 suggests that this is an important omission. Including the number of cooperation partners, we now observe that the effect of cooperation becomes statistically significant at conventional levels. Still, as mentioned, this result should be interpreted carefully, since it is no longer independent of the effect of the number of cooperation partners. Figure 1 provides a graphical representation to aid our interpretation. This indicates that cooperation leads to significantly lower operating costs only when there

TABLE 1 Descriptive statistics

	Source	N	Mean	SD	Minimum	Maximum
Dependent variable						
Operating costs for fire services per capita	Statistics Norway	425	896.0353	422.8253	99	3,483
Independent variables						
Cooperation		427	0.686	0.465	0	1
Contractual agreement		427	0.304	0.460	0	1
Joint organization	Norwegian Directorate for Civil Protection and municipal websites	427	0.382	0.486	0	1
Number of members in cooperation		424	3.64	2.82	1	11
Number of members in contractual agreements		424	1.08	1.97	0	8
Number of members in joint organizations		424	2.25	3.29	0	11
Control variables						
Free revenues per capita	Statistics Norway	427	55,086.9	10,918.84	41,803	129,744
Population (log)		427	8.5	1.16	5.38	13.33
Geographical area (km^2)		427	757.22	899.40	6.18	9,707.35
Population density		427	46.68	27.28	.26	100
Number of call-outs per capita		427	.0041	.0038	0	.03
Instrument variables						
Voter turnout 2011	NSD	426	.68	.05	.54	.84
Latitude		427	62.35	3.50	58.03	71.04
Historical population growth (period 1995–2009)	Statistics Norway	421	.45	13.53	−32.29	51.23
Change in administrative structure in 1995–2010	Norwegian Association of Local and Regional Authorities	413	0.855	0.353	0	1
Quality variables						
Competence level		419	92.86	18.33	0	100
Sweeping rate	Norwegian Directorate for Civil Protection	422	47.30	25.80	0	100
Inspection rate		421	75.23	34.98	0	215.1

Note: All variables are measured in the year 2013, except some of the instrument variables. NSD is Norwegian Social Science Data Services (data taken from Fiva et al., 2015).

are at most two cooperation partners. Afterwards, coordination has no significant effect on costs. Clearly, therefore, the number of cooperation partners has a positive effect on costs (hence, the more partners that are included, the costlier service provision becomes), which is consistent with the assumption of increasing transaction costs when extra partners are included.

When the cooperation dummy is split into separate indicator variables for the two different organizational forms (model 3), we find a stronger negative effect on costs for contractual agreements than joint organization (hence, contractual agreements appear less costly than joint organizations). Again, however, it is important to include the number of cooperation partners within each type of cooperative arrangement (models 4 and 5). This indicates that in both cases there is a negative baseline effect of cooperation (decreasing cost) and a positive effect

TABLE 2 Empirical results from the estimation of the determinants of cost. 2SLS regression

	Model 1 Cooperation	Model 2 Cooperation and their number of members	Model 3 Joint organizations and contractual agreements	Model 4 Joint organizations and their number of members	Model 5 Contractual agreements and their number of members
Inter-municipal cooperation					
Cooperation	−361.50 (252.68)	−481.0 (267.0)*			
Joint organization			−357.2 (254.7)	−393.7 (426.4)	
Contractual agreement			−408.2 (317.6)**		−1,003.5 (500.6)**
Number of members		35.4		59.5	195.5
		(38.2)		(52.3)	(115.9)*
Control variables					
Free income	0.02 (.005)***	0.02 (0.005)***	0.02 (0.005)**	0.02 (0.005)***	0.02 (0.007)**
Number of call-outs	17,675.2 (5094.5)***	16,730.9 (6739.1)***	17,680.9 (5146.7)***	16,730.9 (6739.1)***	8,821.2 (8112.1)
Number of inhabitants	−63.2	−59.6	−66.0	−26.2	40.8
	(35.2)*	(34.5)*	(38.5)*	(38.7)	(68.9)
Area	0.07	0.07	0.07	0.1	0.1
	(.03)***	(.03)***	(0.03)**	(0.03)***	(0.05)**
Population density	−0.7	−0.6	−0.7	−1.6	0.3
	(1.5)	(1.5)	(1.5)	(1.6)	(1.9)
Quality indicators					
Competence level	−0.8	−0.4	−0.9	0.9	−0.2
	(1.1)	(1.2)	(1.2)	(1.4)	(1.4)
Sweeping rate	−0.3	−0.1	−0.3	1.6	−1.2
	(0.9)	(0.9)	(1.0)	(1.1)	(1.3)
Inspection rate	0.6	0.5	0.6	0.3	−0.2
	(0.7)	(0.7)	(0.7)	(0.6)	(0.9)
Constant	733.5	604.8	786.2	−355.7	421.3
	(612.7)	(613.9)	(659.3)	(561.5)	(1,039.3)
F	16.38	14.8	5.6	15.9	5.9
N	399	396	399	278	243
Highest VIF value[4]	5.77	5.64	6.00	4.84	5.73
Underidentification test[2] (Chi-sq(4))	11.990***	12.876***	12.628***	11.234***	12.628***
Overidentification test[3] (Chi-sq(3))	2.933**	2.466***	1.955***	2.835***	1.955***

Note: Dependent variable is measured as operating costs per capita. The main independent variable *Cooperation* is an indicator variable equal to 1 for municipalities engaged in some form of inter-municipal cooperation (0 otherwise). In models 3 to 5, we split this into two distinct indicator variables equal to 1 for municipalities engaged in joint organization of services (0 otherwise) or cooperating using contractual agreements (0 otherwise); in both cases non-cooperation is the reference category. We also tried running the analysis with an interaction term (size times cooperation), which had no significant effect and gave no increased explanatory power to the models. *Underidentification test* is the Kleibergen-Paap LM statistic while the *overidentification test* is the Hansen J statistic. *** indicates significance at 1% level, ** at 5% level and * at 10% level. Robust standard errors in parentheses.

of the number of members in the cooperation (increasing cost). Yet, these findings are both substantively and statistically stronger for contractual arrangements compared to joint organizations (in fact, the observed effects are never significant for joint organizations). This is consistent with our theoretical argument that municipalities organizing
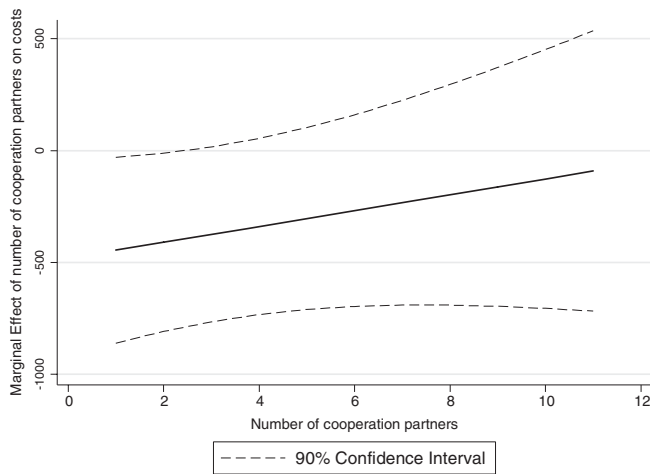
FIGURE 1 Marginal effect of cooperation partners on costs.

their cooperation as new formal organizations face higher transaction costs than municipalities creating contractual agreements—all else being equal.

Figures 2 and 3 again show the marginal effect of additional cooperation partners on service delivery costs. Figure 2 confirms that cooperation via joint organization never results in statistically significant cost benefits (relative to non-cooperating municipalities). Figure 3, however, shows that there is a statistically significant cost benefit in entering contractual agreements with other municipalities as long as these cooperative arrangements do not include more than three participants. When the size of the cooperation group becomes larger, the increase in transaction costs cancels out any (additional) benefits from increased economies of scale.

7 | CONCLUSION

This study compared three distinct organizational forms or governance modes—that is, independent service delivery, cooperation via contractual agreements and cooperation via joint organization—for fire services in Norway. While Williamson's (1975) concern was mainly focused on the question of whether organizations should 'make or buy', we
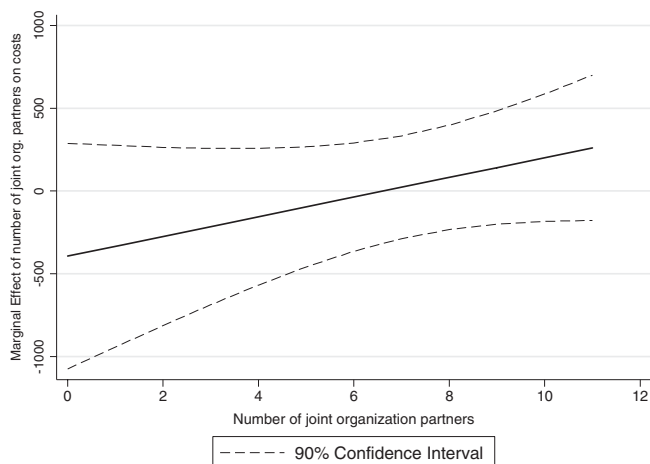

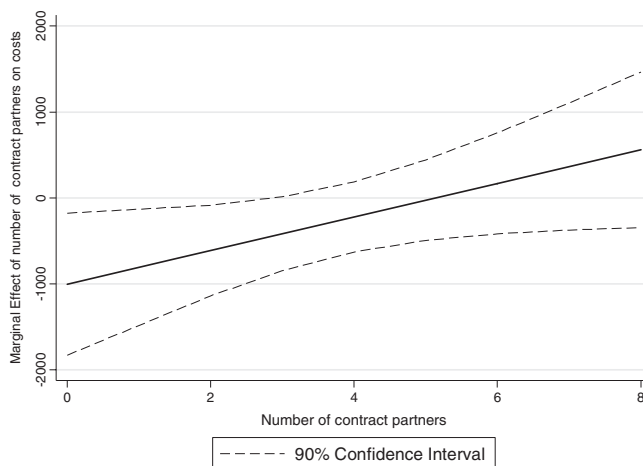**FIGURE 2** Marginal effect of joint organization partners on costs.

FIGURE 3   Marginal effect of contract partners on costs.

pose the question whether organizations should 'make or cooperate'. We furthermore asked what form of inter-organizational cooperation—contractual agreements or joint organizations—is less costly.

Our empirical findings show some support for the idea that costs are lower under inter-municipal cooperation compared to independent service provision, but the positive effect of cooperation is found to decrease when the number of members increases. Hence, any benefits linked to cooperation from economies of scale appear to be cancelled out by increased transaction costs as more members join. This finding supports insights from transaction cost theory (Williamson 1979, 1999), which suggests high transaction costs for services characterized by asset specificity and hazards of probity (such as fire services). The strong territorial dependence characterizing fire services thus appears to serve as a key limitation for cooperation with many partners as a less costly organizational alternative.

We also find supportive evidence for the proposition that the cooperation–cost relation depends on the organizational form this cooperation takes. The results show that service provision costs are lower when creating a contractual agreement (with few cooperation partners), while this is not significantly the case for establishing joint organizations. Still, the costs for including additional contract members are also found to be higher compared to including additional members in a joint organization. This confirms our theoretical proposition that contractual cooperation is initially less costly to start up. Contractual agreements do not require new administrative organs with a joint political body, as is the case for joint organizations. However, it is more expensive to include new members in contractual agreements, because one would have to go through a new round of negotiations each time. In contrast, entrance costs of new members are lower in joint organizations because the organization is already in place. Future research could therefore fruitfully include these two forms of measurement to provide more knowledge on the relationship between type of cooperation, cooperation size and service delivery costs.

When it comes to the generalizability of this study we may argue, in light of Williamson (1979, 1999), that fire services represent a form of service characterized by asset specificity and thus the need for capital goods and specialized personnel and a need for fail-safe production. This is typical for emergency services such as emergency care and disaster management, but not for social services such as kindergartens or schools. It would therefore be expedient to include these types of service in further empirical work.

Furthermore, we emphasize that this is not a study of organizational change. The empirical work is done by conducting a cross-sectional analysis comparing municipalities that provide fire services by using different structural alternatives. Clearly, one would ideally like to assess the effects of distinct organizational forms by analysing what happens under a municipality's transition from integrated production to cooperative production. Finally, this study does not directly measure transaction costs, but operational costs. Even though the two are highly correlated, there is a possibility that this study underestimates the transaction costs of cooperation and thus overestimates the total

cost savings. In addition, the results are delimited to a specific service. Future studies should clearly expand on the type of service, preferably including basic public services such as schooling and health services. Nonetheless, this study has expanded our knowledge of the relationship between interlocal cooperation and service delivery costs by providing data on the importance of the organizational type and size of cooperative arrangements. This knowledge should be incorporated into future studies on inter-municipal cooperation and service delivery costs.

ACKNOWLEDGMENTS

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PAPER II

11. Service quality, inter-municipal cooperation and the optimum scale of operation: the case of local fire departments in Norway

Sara Blåka

INTRODUCTION

Improving service performance in local government is a field of activity that has been widely debated among scholars and practitioners (Gherman et al., 2015). Over the last decades, a multitude of institutional changes have been implemented at the local level to reduce costs and improve quality of public services. Services have been decentralized and centralized between different levels of government, partnerships between public and private organizations have been multiplying, and services have been outsourced to private providers, both commercial and non-commercial (e.g. Bel and Miralles, 2003; Hefetz and Warner, 2012; Pollitt and Bouckaert, 2011). Together, these institutional reforms and experiments constitute a changing political order, where new structures both supplement existing structures and replace them (see Chapter 1 in this volume).

One increasingly common strategy to improve both cost and quality in public services at the local level has been to engage in inter-municipal cooperation (Hulst and Montfort, 2012, 2007). Recent meta studies show that little empirical knowledge exists on what implications such institutional arrangements have for both costs and quality of public services and how their performance compares with "old" institutional arrangements, especially within the European context (Bel and Warner, 2015a, 2015b). The studies that exists, mainly concentrate on how costs are affected by inter-municipal cooperation (Bel and Costas, 2006; Bel et al., 2014; Bel and Mur, 2009; Dijkgraaf and Gradus, 2013; Garrone et al., 2010; Sørensen, 2007; Zafra-Gómez et al., 2013; Hulst and Montfort, 2007). This study highlights another aspect of public services – service quality – and how it is affected by inter-municipal cooperation.

The empirical study focuses on a specific field of municipal services in Norway: fire services, or the prevention of fire and firefighting. This service is an interesting case as it represents a "fail safe" type of service, that is, a service where failure is not an option and thus a service where redundancy is required. In addition, the field includes empirical examples of both the "old order" (municipalities arranging fire services as a traditional municipal department) and the "new order" (municipalities cooperation through different institutional arrangements), making direct comparison possible. The main research question is whether inter-municipal cooperation ameliorates quality of services, or whether problems and costs associated with cooperative arrangements nullifies these gains.

INTER-ORGANIZATIONAL COOPERATION AS THE NEW ORDER

The backdrop of most discussions on inter-municipal cooperation is the size – mostly measured through number of citizens – of the individual municipalities. Many countries are characterized by a multitude of small municipalities, and it is constantly questioned whether these institutions are large and robust enough to tackle new challenges and to efficiently provide services (Bel and Warner, 2015b). Several reforms have been instigated to address these questions, the most prominent being amalgamation of municipalities to create larger and more robust units spanning larger territories, privatization and outsourcing of services to reap benefits from competition and commercialization, and inter-municipal cooperation (Hulst and Montfort, 2007).

Amalgamation of municipalities is high on the political agenda in most European countries, but it is also a highly sensitive political issue (Baldersheim and Rose, 2010). The question of amalgamation touches upon difficult areas such as democracy and identity, making it difficult in many countries to succeed with comprehensive amalgamation reforms. Privatization and outsourcing is also a highly political, salient issue, making such reforms difficult as well (Pollitt and Bouckaert, 2011). In addition, some public services may be very difficult or impossible to outsource or privatize due to lack of public providers or the characteristics of the service itself. We will come back to this last argument. Inter-municipal cooperation is thus an interesting institutional arrangement as it "bypasses" both problems associated with amalgamation and privatization.

In purely theoretical terms, inter-municipal cooperation is an example of relationships between and among organizations that are pursuing a mutual interest while also remaining independent and autonomous, thus

retaining separate interests (Cropper et al., 2008, 9). Inter-municipal cooperation is thus a form of inter-organizational relation (IOR) where two or more municipalities unite resources to solve a common task or challenge (Jacobsen, 2014). Such relations may vary from loosely coupled alliances to the creation of new companies with shared ownership. European countries seem to be characterized with more institutionalized forms for cooperation than is the case in the US (Hulst and Montfort, 2007). The most common cooperative arrangements are joint organizations (with joint production and ownership) and contractual agreements. The first form represents an institutionalized and formalized organization with its own resources and capacities, while the second form usually means contract-based purchase and sale of services without creating a shared organization (Bel and Warner, 2015b). In this chapter we group these two forms of cooperation together and contrast them with municipalities providing services "the old way" through a hierarchically integrated municipal organization.

One of the main rationales for engaging in inter-municipal cooperation is to achieve higher service quality (Bel and Warner, 2015a; Hulst et al., 2009). As noted, inter-municipal cooperation may be regarded as an alternative to municipal amalgamation and to privatization or outsourcing. Inter-municipal cooperation is of special interest when the topic is public services that are difficult to outsource or privatize due to *hazards of probity* (Williamson, 1999). This refers to governments need for fail safe production. The importance of this varies with the type of service at hand. In the case of an emergency, the government cannot fail, and must therefore provide excess capacity. Such redundancy is necessary on a regular basis to ensure fail safe service delivery (Warner, 2011, 425). This is one of the explanations why some public services are more exposed to privatization or outsourcing than others. Warner (2011) shows that residential solid waste services are more often subject to privatization than the more complex services such as emergency handling, schooling or health and human services, which are more often provided through inter municipal cooperation. This tendency can be observed in Norway (Hovik and Stigen, 2008; Blåka et al., 2012).

Fire services, the empirical focus of this study, is an example of "fail safe" production where failure is not an option. As one never knows when or where the next fire will break out, and the failure to extinguish fire is not an option, municipalities will have to be able to mobilize the necessary resources all the time. Redundancy, in the sense of resources that are not used, is necessary. Providing excess capacity in both equipment and labor force on a regular basis is costly, and lack of resources in one municipality may result in insufficient investments with low quality as the final result. Cooperation between municipalities is a way to spread the costs associated with redundancy across several participants, and thus allows

a higher level of investment in the particular service (Williamson, 1979; Williamson, 1985; Hulst et al., 2009). Cooperation can thus be used as a way to gain desired quality of services by sharing the costs between member municipalities. We may therefore extract the following hypothesis:

H1: All other things held constant, inter-municipal cooperative arrangements will display higher quality of services than purely municipal arrangements.

Hypothesis 1 does not take into account the many potential differences between inter-municipal cooperative arrangements. One such element is the number of participants in the cooperation, raising the question as to whether an optimal scale of cooperation actually exists. Hulst et al. (2009, 271) states that 'every service has an optimum scale of operation, i.e. a scale on which the service can be rendered in the required variety and quality at the lowest production cost'. This reflects the classical work of Ellinor Ostrom (1976), who argued that the appropriate scale of an organization depends on the good considered and the range of people affected. In short, the production of different public goods will exhibit different cost functions.

On the one hand, the need for fail safe production, specialized personnel and capital goods (e.g. fire vehicles, boats, helicopters) makes it reasonable to assume that this is a service that can benefit from economies of scale and thus cooperation. On the other hand, this benefit may be limited to just a few cooperating members. Some services are more dependent than others on geography, which may create a maximum scale of operation and serve as a limitation in terms of getting access to cooperation partners and the actual use cooperation may provide them (Bel and Warner, 2015b; Hulst et al., 2009). In the case of fire services there are several regulations in most countries limiting the number of possible participants in a cooperation, the most important being the regulation of a maximum response time (Hulst et al., 2009, 271–272). This limits the territory and thus scale of the optimum organization.

Furthermore, one might expect transaction costs to increase with the number of participants in a cooperative arrangement (Williamson, 1981). As participants are autonomous municipalities, disagreements between them – for instance on the topic of financing of services – will have to be settled through some system of negotiation and bargaining as none of the participants are assigned hierarchical authority. Such negotiated arrangements may in themselves drain considerable resources, and they may also result in sub-optimal solutions. The higher the number of participants, the more complex these processes become, and the higher the probability of sub-optimal solutions. In light of these arguments we may expect that

cooperation may lead to better quality of services, but these scale benefits will get exhausted when the number of members reaches a certain point – making the effect of cooperation nonlinear.

H2: All other things held constant, the positive effect of cooperation on service quality will decrease with the number of members.

MEASURING QUALITY OUTCOMES IN INTER-MUNICIPAL SERVICE DELIVERY

Even though the interest and amount of research concerning IORs is vast, there exists considerable confusion over what the actual outcomes from them are (Provan et al., 2008, 691). Provan et al. (2008, 702) even describe performance as something of a Holy Grail of IOR research. One reason why IOR outcomes are seldom evaluated is because this type of data is hard to assess as it is difficult to isolate the contribution of one organization to the total outcome, while at the same time the outcome for the individual organization is of limited relevance to the cooperation as a whole. However, cooperative arrangements aimed at service delivery are arguably a type of cooperation with a relatively clear goal and outcome compared to more strategic or governance-focused networks (e.g. Klijn, 2008).

Inter-municipal cooperation for the provision of a specific service can be regarded as a structural alternative and thus be directly compared to a hierarchical organizational mode as service delivery cooperation is just another organizational form for producing the same product or service. This does again imply that service quality is not something that is specific to or defined within an IOR but is determined externally either by citizens or by standards developed by professionals (e.g. Rowley, 1998; Kelly and Swindell, 2002).

When measuring quality, a common distinction within the literature is set between perceived and objective quality. Perceived quality can be defined as citizens judgment about an entity's overall excellence or superiority (Rowley, 1998, 325). What characterizes most literature on service quality is that it focuses on perceived quality – mostly linked to customers' judgment (Rowley, 1998). One may argue that in a market system, customer satisfaction may be considered the most important factor because it drives the purchase decision. It is, however, considered as a problematic measure of performance within the public sector because of the lack of a competitive market, and because a number of objectives need to be pitted against each other (Kelly and Swindell, 2002).

Objective quality, on the other hand, involves an objective aspect or feature of a thing or event (Rowley, 1998, 325). It usually consists of a number of specific performance measures which are associated with certain service functions, or are indicators of progress or accomplishments. They can also be described as internal measures of service quality because they come from a definition that is derived and monitored by administrators. Kelly and Swindell (2002) divide these types of performance measure into input and output quality. Input quality refers to what efforts the organization puts into the production, which usually means the degree of professionalism and the overall size of the workforce, while output quality refers to the actual units of service that is being produced (Kelly and Swindell, 2002). In this case we can argue that input quality is a prerequisite for achieving better output quality – which in the end is what matters for creating good service delivery for the public.

A final problem in trying to measure quality outcomes from cooperative arrangements relates to what level outcomes should be measured on: at the level of the cooperation or at the level of the participant (see Chapters 9 and 10 in this volume). What constitutes the "correct" level will depend on what one aims to compare. If one wants to compare different modes of cooperative arrangements, outcomes should be measured at the level of the cooperation. If, on the other hand, one wants to compare whether participation in an inter-municipal cooperation is better (or worse) than standing alone, the analysis should be conducted at the level of the individual participants. In this study the main objective is to study whether individual municipalities increase quality in service provision by engaging in inter-municipal cooperation, and thus the level of interest is the individual member organizations. The unit of analysis is thus each individual municipality, and the effects on quality associated with producing a certain type of service(s) in cooperation with other municipalities or alone as an integrated part of the municipality. A comparison between these forms of organization, which Williamson (1975) terms as hybrid and hierarchy, at the municipal level provides an entry point to study what kind of structural adaptation will promote service quality. In addition, breaking down the cooperation at participant level gives the opportunity to reveal whether the size of the cooperation, in terms of the number of members, affects participants' opportunity to extract scale benefits.

THE EMPIRICAL STUDY

As noted, the unit of analysis is each individual municipality with the main research question being whether participating in an inter-municipal

cooperation promotes – all other things held constant – service quality. The mode of organizing – cooperation or standing alone – is thus the independent variable. First, municipalities that provide fire services within an inter-municipal cooperation were coded as (1), while municipalities providing this service by themselves were scored (0). As noted before, joint organizations and contractual agreements are all treated as inter-municipal cooperation. In the Norwegian context, over 60 percent of Norwegian municipalities have chosen to provide fire services through inter-municipal cooperation. Among these the distribution between cooperation organized as contractual agreements and joint organizations is about equal. The affiliated research question concerns whether cooperation size (number of members) affects service quality. This variable is a numerical variable that measures the number of members each municipality cooperates with, ranging from 1, if the municipality does not cooperate, to 11, which is the largest number of members within a cooperation in the dataset.

The dependent variables consist of three indicators on the objective quality of fire services in Norwegian municipalities. Even though scholars try to detect generic indicators of quality, it is still necessary to adapt quality measures to the specific field of service (Rowley, 1998). The operationalization of service quality in this study builds on Swindell and Kelly's (2000) evaluation of service quality in local fire services in the US, where they distinguish between input- and output-based quality. As noted previously, this study focuses on output quality, the type of quality that is most relevant for citizens, and thus uses indicators on input quality as control variables. Output quality refers to the actual units of service that are being produced. The three output quality indicators are:

- Average response time, meaning the time from when the emergency call is made to when the firefighters are ready for their next assignment. It measures output of emergency fire services (response time).
- Share of chimneys that have been swept, measuring the output of preventive fire services (sweeping rate).
- Share of public buildings that have been inspected, measuring the output of preventive fire services (inspection rate).

Moreover, it is assumed that "sweeping rate" and "inspection rate" are positively associated with service quality, while "response time" is negatively associated with service quality. Thus, we reversed the coding of the variable "response time". To be able to measure the latent variable output quality, these indicators have been used to construct an additive index. Because the variables have various scales they have all been standardized to z-values

by subtracting the average and dividing it with the standard deviation (Ringdal, 2013).

There are, of course, several other factors other than mode of organization that influence service quality. Thus we need to control for a variety of factors. The first group of control variables is indicators of input quality, that is, the resources municipalities put into the production. It seems highly probable that the higher the quality of resources municipalities devote to a service provision, the higher the quality of that service will become. This study employs two measures of input quality: percentage of employees with necessary competence to supervise specific objects (competence level), and full-time-equivalent (FTE) firefighters per 1000 capita.

The second group of control variables is indicators on the context for the firefighting services, that is, factors that may affect quality independent of the mode of organization of the services. Firefighting is a type of service which is characterized by uncertain and fluctuating demand (hence Williamson, 1999). Varying workload may affect output quality in the sense that a large workload may lead to lower capacity leading to higher response time and lower inspection and sweeping rate. We operationalize workload with each municipality's number of callouts.

The third group of control variables refers to a municipality's size, density and area. Earlier studies show that performance is connected to volume of services and dispersion of population (Deller, 1992; Ladd, 1992). Norwegian municipalities vary significantly when it comes to geographical area and population density (Vabo et al., 2014). We may expect that municipalities with large territories will most likely have longer response times than the smaller municipalities. The same goes for population density – municipalities that are densely populated will be able to provide quicker responses than those more sparsely populated. Size in terms of population is included to control for potential scale benefits that occur due to population size rather than cooperation.

The final group of control variables contains information on each municipality's economic capacity or financial slack (Cyert and March, 1963). Municipalities with strong economic capacity will be able to finance good quality services, no matter what the organizational characteristics of the actual service provision are. High quality is thus a result of spending, not organizational form. We therefore include each municipality's general economy, historical growth in income, annual fee for sweeping and inspection, and operating costs of fire services.

One important methodological concern when estimating the effect of cooperation on service quality is that there might be a reverse causality between service quality and the decision to cooperate (e.g. Bel et al., 2014; Geys and Sørensen, forthcoming). We hypothesize that cooperation might

affect service levels, but we cannot exclude the possibility that the level of service quality may also affect decisions on whether to cooperate or not. This makes our independent variables endogenous since they might be correlated with the error term. A common solution to deal with the potential bias that comes from endogenous explanatory variables is to use an instrument variable technique where the endogenous independent variable is estimated in a first step using exogenous instruments, and the estimated results from this equation is used in the second step, which is the equation of interest (Bel et al., 2014, 98). Thus, the instruments chosen should not have a direct impact on the dependent variable but should affect the outcome of interest only through its effect on the relevant explanatory variables, and should be a sufficiently strong predictor only for these dependent variables (Geys and Sørensen, forthcoming, 12).

The instruments chosen for this analysis are as follows: (1) the mean of total costs for municipalities per capita in the years 2011 and 2012, under the assumption that the higher costs municipalities have, the less attractive they are as partners in a cooperation and thus the fewer cooperation partners they will have; (2) population growth from 1995 to 2009 (percentage), under the assumption that municipalities that have had an historical population growth will need to cooperate to ensure their operational capacity; (3) mean distance in minutes to the five closest municipalities (distance from city hall to city hall), under the assumption that the municipalities that lie close to others may find it easier provide services through cooperation (and create larger cooperative arrangements) than those a great distance from others.

Table 11.1 gives an overview of the variables used in the analysis.

RESULTS

To counter the problems of endogeneity the results are obtained by running a two-stage least squares regression. The first stage in this procedure is to create new explanatory variables using the instruments; these variables are then used in the final analysis. This is done by regressing the instrumental variables (earlier total costs for municipalities, historical economic growth and distance to neighboring municipalities) and the control variables on the two variables measuring mode of organization (cooperation or not, and number of members in the cooperation). The model-estimated values obtained from this analysis are used in place of the actual values of the explanatory variables at stage 2.

The first step of the analysis shows that all instrument variables have the anticipated significant effect on cooperation. The Kleibergen-Paap

Table 11.1 Variables used in the equation*

Type of indicator	Indicator	Variables
Independent variables	Cooperation	Cooperation vs non-cooperation[1]
Control variables	Output quality	Response time[2] Number of members[1] Sweeping rate[2] Inspection rate[2]
	Input quality	Competence level[2] FTE firefighters[2]
	Context	Number of callouts[3]
	Demography	Population size[3] Population density[3] Geographical area[3]
	Economy	Free revenues[3] Annual fee for sweeping and inspection[3] Operating costs[3] Growth (changes) in free revenues 1995–2009[3]
Instruments	Earlier total cost for municipalities	Mean of total costs for municipalities per capita in the years 2011 and 2012
	Historical municipal growth	Percentage population growth (or decline) 1995 to 2009[3]
	Distance to neighbor municipalities	Mean distance in minutes to the five closest municipalities (distance from city hall to city hall).[3] Measures the year 2012

Notes:
* All variables except economic growth and the instruments measure the year 2013.
[1] Collected by visiting each municipality's home page, e-mailing or calling up fire chiefs.
[2] Data collected from the Norwegian Directorate for Civil Protection.
[3] Data collected from Statistics Norway (the Norwegian statistics bureau).

Table 11.2   *Two-stage least squares regression (first stage): instrumentation*

	Dependent variable: cooperation	Dependent variable: number of members
Number of callouts	−14.4 (12.5)	−86.5 (80.0)
Operating costs	.0 (.0)*	.0 (.0)***
Free income	1.3 (7.8)	.0 (.0)
Economic growth	−.0 (.0)	−.0 (.0)
Number of inhabitants	−.0 (.1)	−.5 (.5)
Area	.0 (.0)	.0 (.0)*
Population density	.0 (.0)	−.0 (.0)
Competence level	.0 (.0)	−.0 (.0)
FTE	.3 (.1)**	2.0 (.8)***
Mean total cost	−.0 (.0)	−.0 (.0)***
Population growth	.0 (.0)*	.0 (.0)**
Mean distance to neighbors	−.0 (.0)***	−.0 (.0)***
Constant	1.2 (.9)	7.5 (6.6)
F	7.8	6.4
N	199	199

Notes: *** Indicates significance at 1% level, ** indicates significance at 5% level, * indicates significance at 10% level. In parentheses, robust standard errors.

and Hansen J test presented in Table 11.2 shows that we do not have problems with over- or under-identification and thus no weak instrument problem.

The results presented in Table 11.3 show that cooperation has a positive significant effect on service quality, indicating that municipalities providing fire services through cooperation in general achieve higher output quality than those who do not cooperate. The other explanatory variable, number of members that cooperate, shows a significantly negative effect on service quality. These findings indicate that municipalities reap quality gains from cooperation, but that this effect diminishes as the number of participants in the cooperation increases.

Figure 11.1 illustrates the marginal effect of number of participants in the cooperation on quality. The downward slope indicates that the quality benefit linked to cooperation decreases with each extra member included. This effect is significant up to five members, after which the effect turns insignificant.

Finally, and as expected, economic growth positively affects service quality within fire services.

Table 11.3   Results from two-stage least squares regression (OLS)
(instrument variable approach)

	Dependent variable: output quality index
Cooperation	285.4 (119.6)**
Number of members	−28.0 (13.8)**
Number of callouts	5435.7 (3449.0)
Operating costs	0.0 (.0)
Free income	−0.0 (.0)
Economic growth	1.7 (.7)***
Number of inhabitants	−0.9 (16.1)
Area	−0.0 (.0)
Population density	−1.2 (.7)*
Competence level	−0.2 (.6)
FTE	−17.2 (32.5)
Constant	−167.2 (252.9)
F	2.6
N	199

Notes:
Under-identification test (Kleibergen-Paap rk LM statistic): 8.672. Chi-sq(2) P-val = 0.0131.
Hansen J statistic (over-identification test of all instruments): 0.692. Chi-sq(1) P-val = 0.4056.
*** indicates significance at 1% level, ** indicates significance at 5% level, * indicates significance at 10% level. In parentheses, robust standard errors.
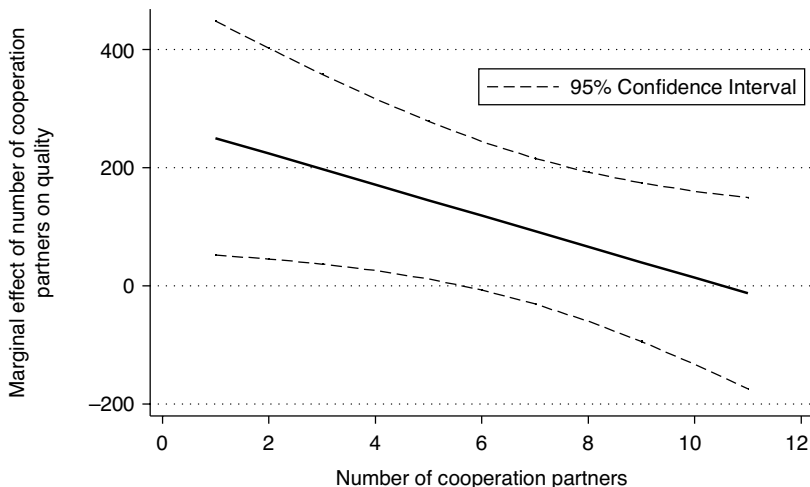

Figure 11.1   Relation between number of cooperation partners and
marginal effect on quality

CONCLUSION

This chapter started out with two hypotheses. The first was that cooperation would increase service quality, while the second claimed that the gain of cooperating would decrease with the number of participants in the cooperation. Results from the empirical analysis of cooperation in Norwegian fire services support both hypotheses. Cooperation leads to better service quality. This again indicates that municipalities may extract scale benefits in the form of increased service quality from joining forces, at least in the case of fire services. It supports the transaction cost theory claims that services that are in need of specialized personnel, capital goods and redundancy to secure fail safe production benefits from creating large-scale organizations. However, these scale benefits decrease as more members join the cooperation.

The last finding may be explained by two different, but related mechanisms. The first mechanism reflects Ostrom's (1976) argument that scale optimizations depend on the range of the service. The strong territorial dependence associated with fire services creates limitations which inhibits large-scale cooperations as an optimum. A large cooperative organization is most likely to cover a large geographical territory, affecting quality negatively in two different ways. First, a large geographical area will imply a longer response time if fire services are centralized in one single unit to reap the benefits of a large organization. Second, if fire services are decentralized or spread over the geographical area in smaller units, it may become more difficult to realize the scale benefits of a large organization. The organization becomes more fragmented, making communication more complicated and costly, as well as making each unit within the organization less robust. For another type of service, less dependent on the physical size of the area the organization covers, the effects of number of members might not be as present as it seems to be within fire services.

The second mechanism relates directly to transaction costs involved in cooperation between (semi)autonomous organizations (Williamson, 1975). All cooperation must take into account the problems of opportunism, that is, the possibility that one of the partners in a cooperative arrangement might not contribute as expected. Such problems will probably increase with the number of participants in the cooperation, as more participants will increase the diversity within the cooperation. More diversity will make agreements more difficult to reach, contracts will be more complex, and monitoring activities will probably increase in both number and intensity, and consequently in cost (White and Siu-Yun, 2005). In this study it is even indicated that inter-municipal cooperative arrangements containing more than five members may in fact result in a lower quality of fire services than by producing alone.

The findings are clearly limited by some methodological weaknesses. One is that data are cross-sectional while the phenomenon itself is clearly dynamic, unfolding over time. We do not know if large fluctuations exist in the quality indicators and we do not know when the transition to cooperation happened. A more ideal approach would be to analyze panel data covering the point in time of transition from non-cooperating to cooperating service provider on all variables. When this is not possible due to lack of data, the alternative is to run the analysis by regression and then statistically target to what extent organizational form affects service quality, as is done in this study.

The findings in this study are also clearly limited to the type of service that is studied. Studying another type of service could yield somewhat different results. It is in this instance reasonable to believe that cooperation over services where objective monitoring of processes and results will entail less transaction costs. Following the idea of Thompson (1967), some organizational activities are easier to measure and thus monitor than others. For some services, like for instance solid waste collection (a service that is often studied when the costs and benefits of inter-municipal cooperation is studied – see Bel and Warner, 2015b), it is possible to measure both production processes and outcomes relatively objectively and at a rather low cost. Cooperation in provision of these types of services might permit a higher number of participants without any loss of efficiency as opportunistic behavior will be more easily detectable.

In this perspective the current study increases our knowledge on the benefits and drawbacks of inter-municipal cooperation by reporting results from a service area seldom studied. Still, most studies – including this one – on the relationship between service performance and inter-municipal cooperation could be described as analyses of more technical types of services. These are types of services where both production processes and outcomes might be rather more easily measured and reported using objective, quantified indicators (waste management, fire services, road maintenance etc.) (e.g. Jung and Jeong, 2013; Bel and Warner, 2015). Although these tasks span several dimensions, we still observe a lack of focus on "softer" and "more human" processing services like social services, health care and schooling, even though municipalities often cooperate on these types of services (Blåka et al., 2012; Hovik and Stigen, 2008; Tjerbo, 2009; Warner, 2011). One main reason for the lack of studies in these important areas is probably that it is more difficult to measure both processes and outcomes of these types of services than the more technical services we have identified above.

With these methodological limitations in mind, we may still argue that this chapter supports the classical transaction costs assumptions that

certain types of services benefit from cooperation and thus scale economies. At a more general level, the findings also show the contours of a new political order at the local, service-providing level of the public sector. As new technological, economic, political and demographic challenges arise, the "old" political order does not necessarily change to meet these challenges. In this case, the basic structure of Norwegian municipalities has remained unchanged in the last 60 years, while at the same time the technological tools to prevent and fight fire have changed immensely. The technology has become more complex, thus demanding better educated and qualified personnel to operate it. At the same time, it has become more expensive, requiring greater capital investments than ever before. Keeping up with the technological evolution is hard for many small municipalities. However, instead of changing the basic administrative and political structure (amalgamation of municipalities), municipalities engage in cooperative arrangements where needed to obtain necessary economies of scale and scope (see Chapter 9 in this volume).

Thus, the "new" order is not suppressing or supplanting the "old" order. Rather, the new order comes as layers of new institutional arrangements in addition to the old institutional arrangements (Pollitt and Bouckaert, 2011). This study indicates that these new institutional arrangements may be more acceptable alternatives to more radical changes in the old political order, at least when it comes to operative effects like efficiency in the production of public services. However, the construction of ever more cross-cutting, parallel institutional arrangements will, of course, render the entire system more complex. Proliferation of structural arrangements both within and between municipalities might have severe consequences for oversight – both political and administrative – over the totality of a municipality's responsibilities (Jacobsen and Kiland, forthcoming). Such a situation may weaken the possibility for political, and thus democratic, steering of the entire system of the whole of the municipality. While fragmentation may be efficient, as it allows for different institutional arrangements for different service areas (with different cost functions), democratic oversight and control might suffer.

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PAPER III

ORIGINAL ARTICLE

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Service quality and the optimum number of members in intermunicipal cooperation: The case of emergency primary care services in Norway

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Abstract

Intermunicipal cooperation (IMC) is often used as a mean to reap scale benefits. Most studies on the effects of IMC focus on cost savings, while service quality is overlooked. In this study, the focus is set on input quality in a service characterized by high asset specificity and need for redundancy: emergency primary care. We analyze how mode of governance affect performance by (1) measuring whether IMC versus single-municipal production affects input quality and (2) identifying optimum scale of operation; effect of the number of participants in the cooperation on input quality. The findings indicate that cooperation weakens the input quality of medical workforce, but that this negative effect is balanced out as the number of participants increases, indicating that cooperation needs to reach a certain size to achieve optimum scale of operation. Concerning equipment, both cooperation in general and an increasing number of participants decrease the input quality.

1 | INTRODUCTION

Intermunicipal cooperation (IMC) has been proposed by scholars as an organizational solution in situations with small-scale production for over half a century (Ostrom et al., 1961) and is used on a large scale by municipalities worldwide. Even so, the literature is still scarce and inconclusive when it comes to what effect cooperation has on a broader set of outcomes than purely cost savings (Aldag et al., 2020; Bel & Warner, 2015a, 2015b). Research on

outcomes representing service quality is particularly scarce, and mostly confined to the US context (Aldag et al., 2020). Aldag et al. (2020) even argue that costs savings due to cooperation are limited and shared municipal service delivery mainly should be considered a way to achieve better service quality or access to services. Still, systematic evidence on the relationship between IMC and quality is scant and "we need to identify better ways to measure them" (Aldag et al. 2020, p. 286).

Given the inconclusive results from research on the outcomes of IMC versus other modes of governance (Bel & Sebő, 2021; Bel & Warner, 2015b), more attention also should be given to different ways that IMCs are organized. One important organizational element is clearly the number of owners (i.e., municipalities) participating in the cooperation as this may create problems with dispersed ownership and multiple principals (Aldag et al., 2020; Bel et al., 2014; Bel & Sebő, 2021; Bel & Warner, 2015b; Blåka, 2017a, 2017b; Sørensen, 2007). It is thus not only a question of cooperating or not, but also a question of optimal number of governing actors and potential challenges with multiple principals (Voorn et al., 2019).

This study thus contributes to the research on outcomes of IMC by (a) comparing IMC with single-municipal production, (b) focusing on dimensions of service quality, and (c) investigating whether there is optimum number of members in IMCs in the field of emergency primary care (EPC) services in Norway. We do this by providing empirical evidence on to what extent IMC affects input quality, and how this effect may depend on the size of the cooperation and type of quality.

1.1 | IMC and service quality

The rationale for shared service delivery is mainly to pool resources and thus enhance performance (Bel & Warner, 2015a; Hulst & Van Montfort, 2007). Cooperation is thereby used as a tool to create scale benefits which means that the larger the production unit is, the more resources they may allocate to utilize and invest in important production factors such as equipment and competence (Williamson, 1985). While the decision to privatize mainly lies in the expectation to save cost, shared service delivery is also driven by concerns about service quality (Aldag & Warner, 2018; Bel & Warner, 2015a; Holzer & Fry, 2011; Warner & Hefetz, 2002). Levin and Tadelis (2010) suggest that an explanation for why cooperation is preferred over privatization is that governmental actors will be more concerned with quality than private contractors. Even so, studies that measure the effects of cooperation versus other modes of governance on service quality are scarce (Aldag et al., 2020; Bel & Sebő, 2021). To our knowledge, earlier research that study effects of cooperation on service quality is very limited. In the European context, Arntsen et al. (2021) show that small municipalities experience greater perceived service quality from cooperating in EPCs than larger ones. Blåka (2017b) shows that municipalities in IMCs with fewer members achieve better output quality than single municipalities and municipalities in IMCs with more members in fire services. Allers and Greef (2018) investigate whether the amount of spending on IMC affected service quality levels but do not find a connection between the two.

Traditionally, most measurement of service quality has revolved around customer or user perception of services in relation to expectations (Cronin & Taylor, 1992; Rowley, 1998). This type of quality measurement is widely used in the studies of both single-organizational (e.g., Jain & Gupta, 2004; Rowley, 1998) and interorganizational (Roehrich et al., 2020) performance.

For many public services that are highly professionalized, such as health care, subjective measures encounter severe challenges as it is difficult for citizens to evaluate (Blåka, 2017b; Kelly & Swindell, 2002; Rowley, 1998). Recent studies call for more objective indicators of service quality, specifically in EPC services (Arntsen et al., 2021). In this study, we narrow the focus to two objective indicators: access to *specialized equipment* and *work force*. These factors have traditionally been used as performance measurements and defined as a form of input quality (Kelly & Swindell, 2002; Rowley, 1998), indicating "what efforts the organization puts into the production" (Blåka, 2017b, p. 238). In an early discussion on production functions, Griliches (1957) pointed to the crucial importance of input

quality of capital and labor to explain differences in productivity between firms. Capital quality is usually measured in monetary units (price of equipment), while labor quality is measured most commonly through the experience and education of employees (Fox & Smeets, 2011). Rather than studying the price of equipment, we concentrate on the IMC's access to specialized equipment, in addition to access to a highly specialized workforce (nurses, doctors). This is a quite common way to measure input quality in health services/hospitals (Chen et al., 2019). Compared to customer or client perceptions of quality, more objective measures of input quality are by some argued to be a "... particularly fruitful future research avenue" for research on effects of interorganizational relations (Roehrich et al., 2020, p. 464). However, we are clearly aware of the fact that input quality is only one facet of service quality, and that total service quality is (at least) a function of input quality, process quality, and output quality (Donabedian, 1978).

1.2 | IMC, scale of production, and dispersed ownership

As already noted, the basic idea of IMC on service provision is to increase the production volume to obtain scale benefits. However, as Bel and Belerdas-Castro (2021 p. 5) points out, "the potential effects of cooperation (is) likely (to) differ across services, because the optimal scale is different for each one." This coincides with Hulst et al. (2009) who emphasizes that every service has an optimum scale of operation and Ostrom (1976) who argued that the appropriate scale may depend on the good considered. Empirical studies show that different services hold different optimum scales of operation, but we still lack research on a greater variety on service characteristics (Aldag et al., 2020; Blåka, 2017a, 2017b). Reaching a certain level of production is especially important for tasks characterized by *redundancy* and *asset specificity* (Williamson 1979, 1991, 1999). Asset specificity refers to what degree investments in capital goods (for instance, buildings, machines, helicopters, etc.) can be exploited beyond the specific service field (Brown and Potoski 2003, 2005). The lower possibility for use beyond the specific service, the higher the asset specificity. As an example, one can argue that asset specificity will be higher for fire services than auditing services as fire trucks have fewer alternative areas for use than computers used for accounting.

Redundancy refers to the level of excess capacity needed. Some services experience uncertain and fluctuating demand, raising a question on how to calibrate organizational resources. For organizations with a need for fail-safe service delivery, this question becomes accentuated. Some public services—such as fire services and emergency care—simply cannot fail, and municipalities will therefore need to provide capacity (capital goods and personnel) that on a regular basis will be "redundant" (Warner, 2011, p. 425). The organization's resources must be dimensioned to meet the accidental fire or the next large accident. Other services such as auditing services and solid waste disposal are in contrast characterized with more stable demand and with greater possibility to handle fluctuations by smoothing or spreading workload over a longer period.

The higher the asset specificity and demands for redundancy, the higher the potential scale benefits. For many municipalities, the only way to reach the optimal level of production is to cooperate with other municipalities. Thus, based on classic production theory, we should assume that service quality will increase as cooperation increases the production volume. And, based on transaction cost economics, these effects should be most significant for services characterized by high asset specificity and needs for redundancy.

Cooperation, however, activates another problem: multiple principals and dispersed ownership. In the framework of principal-agent theory (Fama & Jensen, 1983), shared service delivery requires at least two owner municipalities that act as principals. A recent review (Voorn et al., 2019) shows that multiple principals may lead to a variety of challenges such as goal incongruence (Young et al., 2002), problems with accountability (Schillemans & Bovens, 2011), poorer coordination, and weaker incentive schemes for agents, which again can impair performance (Bernheim & Whinston, 1986; Dixit, 2002; Martimort, 1992; Stole, 1997).

Agency theory also forms the benchmark model for corporate governance and dispersion of ownership (Fama & Jensen, 1983). The more concentrated ownership, the higher incentives to oversee company management, which

again are expected to enhance performance. Contrastingly, the more dispersed ownership the greater distance between owners and managers, again weakening each owner's overall responsibility and incentive to monitor performance. Owners may also have different interests, something that creates difficulties in reaching agreement on common goals and priorities (Sørensen, 2007, p. 1047). We can argue that this is an even greater issue in local governments than in privately owned organizations since political authorities exercise a more complex form of indirect ownership since it is delegated from citizens (Shleifer & Vishny, 1997). In a corporate governance view, the worst case is a combination of indirect and dispersed ownership—resulting in weaker performance than the hierarchical mode—which represents a concentrated ownership (Sørensen, 2007). Dispersion of ownership and thus problems of multiple principals have been found to affect performance negatively in IMCs by Garrone et al. (2013), Sørensen (2007), and Blåka (2017a, 2017b).

Detecting the optimal scale of public services—population size and dispersion (Deller, 1992; Ladd, 1992)—lies in the core of local government literature (Dixit, 1973; Hirsch, 1959; Oates, 1972). In this study, we hold these scale effects constant and focus on governance-related issues of cooperation. By using the framework of Fama and Jensen (1983), we ask whether cooperation will create multiple principal problems (hence Voorn et al., 2019) and if an increase in owners (principals) will increase this problem. We can infer two hypotheses based on this framework. First, the framework suggests that IMC weakens owners' incentive to prioritize and invest which in turn weakens performance and secondly, that the performance will be further weakened as more members that are included, leading to the following two assumptions:

H1. *All other things held constant, inter-municipal cooperative organizing will display lower service quality than purely municipal arrangements.*

H2. *All other things held constant, the negative effect of cooperation on service quality will increase with the number of members.*

1.3 | Study setting

Norwegian municipalities cooperate on a large variety of public tasks, including EPC (Monkerud et al., 2016). While the state is responsible for providing specialist health-care services, municipalities are responsible for providing primary health-care services, including EPC (Arntsen et al., 2020). A great local autonomy in organizing service provision results in substantial variations between municipalities when it comes to how local EPCs are organized (Arntsen et al., 2021; Morken et al., 2019). The great diversity in municipalities' size (ranging from approximately 200 to 800,000 inhabitants) combined with high local autonomy makes Norway a case where we may expect cooperation to have impact. In addition, Norway serves as a European case in a field where empirical work so far mostly stems from the United States (Aldag et al., 2020; Bel & Sebő, 2021).

Comparative studies across countries show diversity in how IMCs are formalized, varying from loosely coupled alliances to highly formalized companies with shared ownership (Blåka, 2017a, Bel & Warner, 5b, 2015a; Hülst & Montfort, 2012; Hulst & Van Montfort, 2007). European countries seem to choose more formalized organizational forms like standing joint organizations (with joint production and ownership) or contractual agreements (purchase and sale of services) than what is the case in the United States (Bel & Warner, 2015b).

The most widespread organizational form within shared EPCs (and for local shared health services in general) in Norway is the host municipality model. This is a contractual agreement where municipalities delegate the operational and administrative governance responsibility to one of the participating municipalities (Arntsen et al., 2020; Monkerud et al., 2016). Earlier mappings show that about 40% of all municipalities provide their EPC through a host model, while approximately 25% provide it through joint organizations (Monkerud et al., 2016). The EPCs provide medical assistance to all inhabitants either at the EPCs location or by driving out to the patient's location when the

General Practitioner (GP) office is closed. Thus, EPCs provide services at evening and night time at weekdays, and around the clock in weekends (Arntsen et al., 2020). EPCs are staffed with GPs that are employed in the member municipalities while other medical personnel such as nurses are employed directly at the EPC. The GPs work daytime in their respective municipal medical centers and are by their contracts obliged to also work part-time as doctors at EPCs (The Norwegian Directorate of Health, 2020). EPCs are thus in need of costly and transaction-specific medical equipment and highly trained professional personnel and are also characterized by redundancy due to uncertain demand (e.g., The Norwegian Directorate of Health, 2020; Tjerbo & Skinner, 2016). Furthermore, in Norway, there is a significant variation in both equipment and work force quality in emergency care services (Morken et al., 2019), but no studies of whether this is linked to the mode of governance or the size of a cooperation. This variation reflects that the state has less restrictive legislation here than, for example, for fire services who operate in a more regulated context. The laws regulating EPCs only specify minimum requirements, for instance that a certified doctor should be available, leaving great space for local variation above this minimum level. Concerning equipment, there are no specific regulations other than to be able to "conduct diagnostics and implement necessary medical treatment and surveillance in acute situations" (Regulation on EPC, § 9). The rather weak national regulation leaves great room for the use of local discretionary decisions and thus for variation between EPCs.

1.4 | Data

Our data are drawn from three main sources: (1) The National Out-Of-Hours Services Registry, which are managed by the National Centre for Emergency Primary Health Care in Norway which provided all data concerning emergency centers, (2) Statistics Norway, and (3) Fiva et al. (2017) who provided data for the instrument and control variables.

In contrast to many studies on the effects of IMC, this study does not focus on the municipal level and thus not on the effects of IMC for each municipality (Bel & Sebő, 2021). Instead, we study the service providing unit (like Pérez-López et al., 2018; Pérez-López et al., 2015, 2021; Pérez-López et al., 2016; Zafra-Gómez et al., 2020), regardless of whether is provided through interorganizational cooperation or by municipalities on their own (Provan et al., 2008). Keeping the analysis on this level is necessary to be able to compare eventual effects of different governance modes on input quality.

Keeping the analysis on the organizational level makes the quality measures directly comparable as there is no need to aggregate from the municipal level. Quality of work force is measured by an unweighted sum of dichotomous variables measuring what type of personnel (doctors, nurses, and other medical personnel) that is available at daytime, evening, and nighttime. The maximum score on this variable is 6 and the minimum is 0. The value of six indicates the highest quality level of the work force.

Quality of equipment refers to capital goods that are specific to the task at hand (Williamson, 1999). In the case of emergency care services, doctors and other medical personnel should have access to necessary medical emergency equipment. Every municipality have the responsibility to make sure medical personnel are equipped to respond to medical call outs, although—as noted—it is not specified in detail what equipment that must be available at each EPC (The Norwegian Directorate of Health, 2020). Ideally, as specified by the medical standards in the field, EPCs should have access to emergency car, driver, defibrillator, medications, radio terminal, tablet with access to patient information and the emergency center, and emergency uniforms. The equipment variable is measured as an unweighted sum of equipment that is available at the individual emergency care unit. Maximum score is 11, minimum 0, the higher the score the more equipment the center has. Even though the general development over time is that emergency centers are getting access to more of this equipment, there are still substantial variations (Morken et al., 2019). A challenge with using an unweighted index is that it does not consider the possible qualitative differences between the different types of equipment. When we have chosen to use an unweighted estimation, it is because the standards predefined by the medical field in EPC do not rank the different types of equipment in

relation to medical importance. Still, as the measure on personnel quality, the measure on equipment quality is rather crude.

Three variables measure different elements in the IMC. The first (governance mode) is a dichotomous variable measuring whether it is an IMC (1) or a single municipality (0). The second measures the number of members in the cooperation. This variable takes on the numerical value of 1 if it is a single municipality, and the maximum of 12 in this study, with a mean value of 3,5 members. Hulst et al. (2009) state that shared service delivery across Europe is characterized by great diversity. The organizations vary with respect to the number of participants and the number of services they provide. This is also the case in the Norwegian context. Leknes et al. (2013) show that in their mapping of 750 Norwegian IMCs, there exist great variations in number of members in each cooperation, spanning from 2 participants to nearly 50 members in the largest ones. Unfortunately, we have not been able to locate similar mappings on a European level.

The third (varying numbers) is a variable measuring whether the number of members is varying during the week. Some municipalities are only members of the emergency center during the weekends (Saturday and Sunday) or nighttime, while producing the services as a single municipality on weekdays. This is measured as a dichotomous variable taking on the value of 0 if the number of members is stable during the whole week, and 1 if it is varying.

1.5 | Control variables

Using panel data with data from three points in time allows us to control for individual characteristics of each emergency care unit, as well as for change over time. As quality will have direct consequences for costs involved in the service provision (higher wages for qualified personnel, higher price for high quality equipment), we include control variables known to affect eventual economic benefits of scale (Bel et al., 2014). First, the *population in the emergency unit's geographical* area is used as a proxy for production volume. We thus expect a clear and positive effect of population size on both access to equipment and work force. Second, *population density* is included. One may expect that IMCs with high dispersion may need greater input quality—and that densely populated localities may benefit from economies of density (Raknes, 2015). Third, *centrality* of the emergency center is included to account for the proximity of the emergency unit to other medical and care services at the regional level. It is assumed that emergency services located in the physical proximity of the regional center will have easy access to both equipment and personnel in their close vicinity, thus making it less necessary for the emergency center itself to invest in highly competent personnel and sophisticated equipment. Finally, we include *resource munificence* (Provan & Milward, 1995). Emergency centers are—by law—financed by municipalities as part of their core services. The amount of financial resources available for investments in input quality factors devoted to each emergency center will thus most probably depend on the general economy in the member municipalities.

For the control variables, data were aggregated from the municipal to the EPC level. For each EPC, the population is measured as the sum of the population in each of the member municipalities. As this variable is highly skewed toward small values, the variable was log transformed. We include inhabitants per square kilometer to measure the population density in the locality. As this variable contains the variable "area" used for instrumental purposes, we decided to center area (i.e., "mean area" minus "actual area") and use the centered term in the computation of the density variable. To measure each EPC's general economy, we use net operating profit as a percentage of gross operating revenues in each of the participating municipalities. This measures the resources municipalities have available for investments, something that is highly important to EPCs because their service level depends on their ability to invest in medical resources. To aggregate this number to the IMC level, each member percentage has been multiplied with its number of inhabitants and divided with the population of the cooperation as a whole.[1] The economy of the EPC area is thus weighed according to the population size of the participating municipalities. The higher this number is, the better the economy. We use colocation with hospital and colocation with ambulance as measurement of

possible colocation benefits and whether the county administration is located in the emergency center's area as a proxy for possible urbanization benefits (Aldag et al., 2020).

1.6 | Empirical strategy

All data for the emergency centers were measured for three periods (2014, 2016, and 2018). The control variables were lagged, and thus measured for 2013, 2015, and 2017. Two of the instrument variables have been constructed as the mean value from the years 1997–2007. The reason for the chosen time span is that cooperation has had its main growth over the past 30 years in Norwegian municipalities (Leknes et al., 2013). Table 1 displays the descriptive statistics for all variables used in the analysis.

The highest bivariate correlation is between "IMC" and "number of members" (Pearson's $r = 0.67$, significant at the .01 level), indicating low probability of collinearity. Full table of bivariate correlations is available from the authors on request.

The main objective of this study is to examine the potential relationship between governance forms of a specific public service (medical emergency services) on the input quality of this service. The general model to be tested is thus:

$$\text{InputQuality} = F(\text{mode of governance, IMC size, varying number, controls}) \tag{1}$$

Input quality is measured as two distinct components: quality of equipment (Q_1) and quality of work force (Q_2). Organization is measured as IMC or not (X_1), number of members in IMC (X_2), and varying membership or not (X_3). The controls are the economy of the member municipalities (X_4), the log transformed population in the member municipalities (X_5), the population density in the area covered by the emergency unit (X_6), colocation with hospital (X_7), colocation with ambulance services (X_8), and colocation with county administration (X_9). The empirical model to be tested is:

$$Q_{1-2} = a + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + \beta X_5 + X_6 + X_7 + X_8 + X_9 + e \tag{2}$$

The analysis is run as a panel analysis with fixed effects for emergency center and time (the xtivreg2 command in Stata 16.1). To determine whether a random effects model should be used, rather than a simple OLS regression we conducted a Lagrange Multiplier test (Breusch & Pagan, 1980). This test proved significant for both dependent variables indicating that a random effects panel model is appropriate. We then performed a Hausman test to investigate whether to use fixed or random effects. The Hausman test proved to be significant for one dependent variable (access to equipment), but not for the other (access to work force). We chose to run the analysis with fixed effects for all outcomes to make the results more comparable (running the analysis with a random effects model did not yield significantly different results). Even though the data consist of panel data over three periods, there is still a methodological concern of endogeneity. We assume that cooperation will affect input quality, but we cannot exclude the possibility that level of input quality may affect the decision to cooperate (Blåka, 2017a). To counter this problem, we implement an instrument variable approach using a two-stage least square regression. In the first stage, we regress the possible endogenous variables with a set of instruments. In the second stage, we insert the predicted values from the first-stage regression instead of the first-stage variables (Blåka, 2017a, p. 1099).

We rely on three instruments that jointly instrument for the possible endogenous independent variables. Our main rationale for the chosen instruments is grounded in the assumption that political variables mainly affect the decision to cooperate, and the size of the geographical area mainly affects the number of members included. The political variables are (1) Mayor from right-wing party. The transaction cost framework allows us to consider modes of governance as a continuum with different degrees of integration, reaching from hierarchy, which is the most integrated, through hybrid to market which is the least integrated mode of public service production (Williamson, 1991). While studies have shown that right-wing governments tend to be associated with private production (Bel et al., 2013, p. 442), we may argue that when it comes to the comparison between hierarchy and cooperation, leftist

TABLE 1 Descriptive statistics

	Source	Year of measurement	N	Mean	SD	Minimum	Maximum
Dependent variables							
Equipment	National Centre for Emergency Primary Health Care	2014, 2016, 2018	542	5.05	2.06	0	11
Work force			542	1.60	1.72	0	6
Independent variables							
IMC			542	0.55	0.50	0	1
Number of members			539	2.35	1.84	1	12
Control variables							
Varying number of members |(1 = yes)			542	0.09	0.29	0	1
Colocated with hospital			542	0.17	0.38	0	1
Colocated with ambulance			542	0.10	0.30	0	1
Net operating profit	Statistics Norway	2013, 2015, 2017	530	2.75	2.95	−3.61	21.3
Population (log transformed)			535	9.32	1.38	6.14	13.41
Population density			535	187.37	2449.62	0.30	54887.16
Input quality Work force	National Centre for Emergency Primary Health Care	2014, 2016, 2018	585	0.33	0.47	0	1
Input quality Equipment			585	0.33	0.47	0	1
County administration	Fiva et al. (2017)		543	0.05	0.17	0	1
Instrument variables							
Area (log transformed)	Statistics Norway	2018	533	6.84	1.20	2.28	9.16
Female Mayor	Fiva et al. (2017)	Mean 1997–2017	543	0.15	0.14	0	0.71
Mayor from right-wing party			543	0.51	0.28	0	1

governments are more prone to integrate public service delivery, while right wing-dominated governments are more in favor of hybrid or corporate ("business") organizational modes (Schoute et al., 2020). (2) Female mayor. Here, we base our hypothesis in more general leadership research. Glass and Cook (2018), in their review of the literature, point out that women leaders are more committed to inclusion and relationship building. This contributes to greater commitment to and awareness of the needs of various stakeholders. We thereby expect that this favors engagement in shared service delivery. (3) Geographical area. We expect that the larger the area covered by the ECS, the higher are the number of members since having a larger area to cover might trigger a higher need for collaboration.

The first stage results are not included in the paper for reasons of space but show that all instruments are statistically significant in the hypothesized direction (details upon request).

1.7 | Estimation results

Table 2 shows the results of step two of the instrumental analysis which uses the predicted values of the first-stage regression instead of the original cooperation variables. It is worth noting that mode of governance (IMC or single

TABLE 2 Empirical results from the estimation of the determinants of input quality

	Model 1: Quality of equipment	Model 2: Quality of work force[a]
IMC	−2.80 (1.6)*	−3.40 (1.3)***
Number of members	−0.28 (0.5)	1.07 (0.4)***
Varying number (1 = yes)	0.37 (0.4)	0.07 (0.3)
Colocated with hospital	−0.45 (0.4)	−0.23 (0.3)
Colocated with ambulance	−0.46 (0.4)	0.25 (0.3)
Net operational profit	0.05 (0.0)	0.01 (0.0)
Population (log transformed)	3.52 (1.3)***	0.87 (1.0)
Population density	0.00 (0.0)	0.00 (0.0)
Time 1	−1.01 (0.2)***	0.33 (0.1)***
Time 2	−0.69 (0.2)***	−0.03 (0.1)
Co-located with county administration	30.16 (10.2)***	19.83 (7.8)***
N	506	506
F-value (Anderson-Rubin Wald test)	3.18	4.06
Underidentification test (Anderson canon. Corr. LM statistic) Chi-sq(2)	62.711***	62.711***
Overidentification test of all instruments (Sargan statistic) Chi-sq(1)	2.388	2.028

[a]For robustness check, we also conducted the analyses including only doctors in the work force variable. This estimation showed the same tendency as the presented variable.*** indicates significance at 1% level, ** at 5% level and * at 10% level. In parentheses, robust standard errors.

municipality) and the number of cooperation partners are included in the same analysis, and should thus not be interpreted in isolation. The first variable (mode of governance) indicates the general effect of cooperation versus producing service within one municipality. The second variable—number of members—shows the effect of increasing the cooperation by one more member. To clarify these effects, we include two graphical figures of the marginal effect of cooperation on respectively quality of equipment and quality of work force. They show the marginal effect of increasing cooperation with one member and the effect of collaboration versus single municipal service delivery which are shown when moving from 1 to 2 members, and stays fixed after that.

Model 1 indicates that IMC has a negative effect on access to medical equipment. Number of members does not have a significant effect in the linear model. Figure 1 provides nuance to the linear model and shows that the marginal effect is significant from 1 and up to approximately six partners. This aids our interpretation by showing that the number of members has a significant effect. And though it is always negative, we see that the strongest negative effect takes place when going from one to more than one—indicating that the largest drop in equipment quality takes place when going from production in single municipalities to a cooperation, no matter the size of the cooperation. The negative effect of cooperation on equipment quality is however further significantly reinforced by an increase in the number of members, at least until the cooperation reach approximately six members. For larger cooperations, the negative effect is insignificant. The results thus indicate that the organizational form that has the best access to high-quality medical equipment is the single-municipal EPCs.

Model 2 shows that the effect of cooperation on quality of work force also is negative, but in this case the number of members has a positive effect. Figure 2 illustrates this graphically and shows a significant negative effect of going from single-municipal to cooperation mode, while the effect of each extra member in itself has a positive effect, significant from approximately six members.
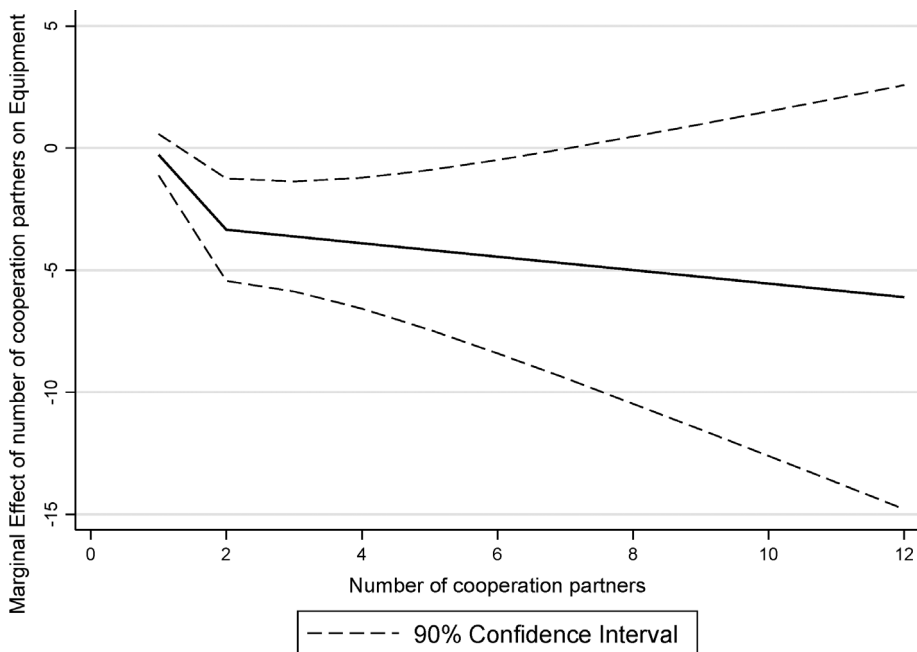
FIGURE 1 The effect of cooperation versus single municipality (from 1 to 2), and the marginal effect of number of members (from 2 to 12) on quality of equipment

The joint interpretation of this is that cooperations with two members (contra single-municipal units) weaken EPCs work force and that cooperation needs to reach a certain size before scale benefits are obtained.

2 | DISCUSSION

We started with two main hypotheses, derived from agency theory. The first was that cooperation would inhibit EPCs input quality and the second that an increase in members would lead to a decrease in quality due to multiple principal problems. The empirical findings only partially support the hypotheses, indicating that the effect of dispersed ownership depends on type of performance, that is, type of service quality. We find that some dimensions of input quality are more vulnerable for multiple principal problems than others. H1 is supported by the findings who indicate that moving from single-municipal production to IMC—independent of the number of members in the cooperation—lowers the input quality of both equipment and work force. The variable number of members in the cooperation makes the picture more nuanced—showing diverging results between the two dimensions of input quality. The results indicate that it is possible to reap some scale benefits on work force quality through cooperation, but this effect does not take place before a certain size is accomplished (in our case six or more members). For smaller cooperations, the drawbacks of cooperating seem to outweigh the benefits. This finding shows that the optimum size of operation is different for work force and equipment, indicating that the effect of multiple principals varies according to the type of input quality—at least in the case of Norwegian EPCs.

IMC represents a situation where several principals, all of them with potentially different preferences, for instance over funding, and overall priority of the service, must agree. The EMCs access to medical equipment is thus dependent on the principals' decision to invest. Given the weak state regulation of the service field, such investment is highly dependent on principals prioritizing and agreeing. The development over the past years for Norwegian EPCs has been that central authorities have increased their expectations to what medical equipment these units should
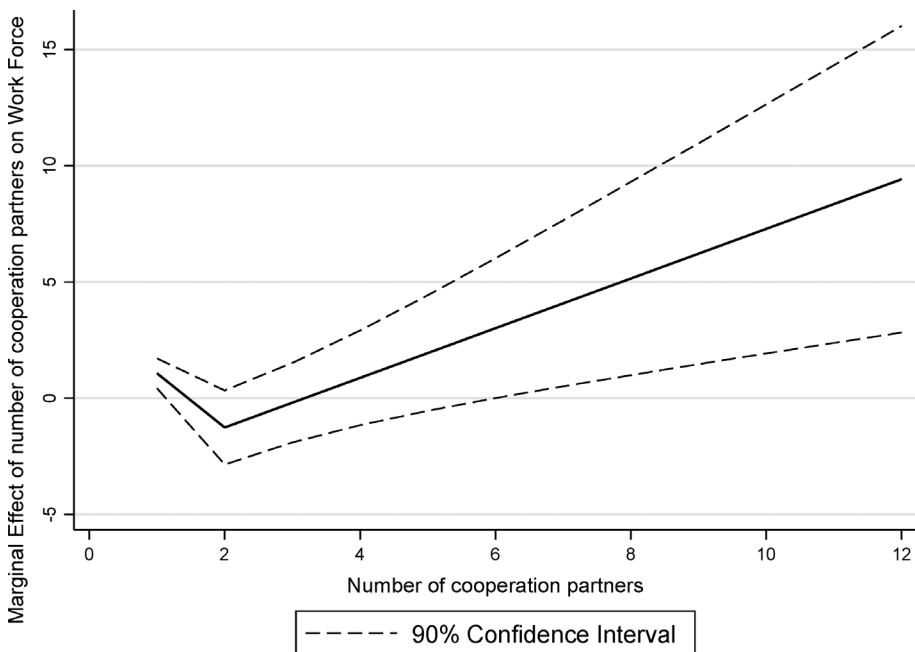
FIGURE 2 The effect of cooperation versus single municipality (from 1 to 2), and the marginal effect of number of members (from 2 to 12) on quality of work force

have access to. These expectations are, however, not made mandatory (The Norwegian Directorate of Health, 2020). When we consider that the general development is that EPCs have been getting access to more equipment (Morken et al., 2019), our results indicate that intermunicipal collaborations are not able to keep up with the increase in the availability of equipment to the same extent as the single-municipal service units. And the more members included in the cooperation, the more difficulty they have in accumulating these capital goods. The findings support our assumption that cooperation leads to multiple principal problems and that this problem increases with the number of principals when it comes to EPCs access to medical equipment.

The results on the two forms of input quality are diverging. We argue that the reason for this lies in the specific service context. While investment in capital goods (equipment) is determined at the service unit level, investments in labor—more specifically doctors—are determined by each municipality National laws and regulation obliges each municipality, regardless of size, to provide medical services from a municipally employed doctor. Furthermore, the laws and regulations oblige each municipally employed doctor to devote some time to a municipal or intermunicipal EPC (The Norwegian Directorate of Health, 2020). The increase of each member to the cooperation here thus also activates almost "automatically" an increase in the EPCs pool of doctors available for duty. Access to doctors is thus almost independent of any prioritizing in the deciding organs of the EPC. This stands in contrast to investments in capital goods that needs to be agreed upon and financed separately by every principal and transferred to the intermunicipal level. The negative effect shared service delivery has on the accumulation of capital goods may lie in problems with free-riding among principals. The dispersion of ownership wears out each owner's responsibility which hinders their incentive to invest. We may thus argue that investments in labor is not as vulnerable to multiple principal problems as investments in equipment and have greater possibility for creating benefits of scale due to the number of partners (see also Blåka, 2017a; Blåka, 2017b). Interestingly, results show that moving from single municipality production to cooperation results in lower access to work force. This indicates that the cooperation needs to reach a critical size to be able to reap this benefit.

Most important, this study shows that—at least for a specific public service in Norway—IMC is no guarantee for increasing service quality. On the contrary, cooperation in itself seems to create obstacles that in fact lower quality. The most reasonable explanation for this decrease in quality is to be found in problems and cost associated with multiple principals and dispersed ownership, supporting previous studies (Sørensen, 2007; Voorn et al., 2019). However, the study also shows that cooperation does not necessarily have a uniform effect on performance—indicating that the possibility to extract quality gains due to cooperation depends on what dimension of quality you consider. While the quality of some input factors remains stable or decreases with the number of members in a cooperation, the quality of other input factors may increase with the number of members. In this study, we argue that this can be explained by whether resources are located at the municipal or intermunicipal level.

We need to emphasize that there are several methodological shortcomings in this study. First of all, as Arntsen et al., (2021, p. 273) points out, "the diverse and complex nature of service quality within the context of health care makes it difficult to capture through objective measures." What this study captures are some aspects of service quality. Another limitation in this study is the narrow focus on organizing of IMCs. Organizational features of IMC can be broken down into various typologies (Hülst & Montfort, 2012; Hulst & Van Montfort, 2007; Voorn et al., 2019). The only dimension included in our analyses are number of members, while recent studies have shown that formalization of cooperation also is of importance when it comes to the IMCs performance (Bel & Warner, 2015b; Blåka, 2017a; Voorn et al., 2019).

3 | CONCLUSION AND SUGGESTIONS FOR FUTURE RESEACH

The general finding in this study is that cooperation—when production volume is held constant—has a negative effect of quality. This indicates that EPC—when input quality is a concern—is provided best by single municipalities. What this study further advocates is that the possibility to extract scale benefits from cooperation depends on what type of performance you measure and the number of cooperating members. The divergent findings support a need to untangle dimensions of performance to differentiate effects of cooperation. We conclude, like Holen-Rabbersvik (2019) that future research needs to address "how and when IMC is most beneficial" (p. vi).

When it comes to generalizability, we argue that EPCs represents a type of service characterized by high asset specificity and a need for redundancy. As pointed out earlier, most studies on effects of IMC focus on costs in the field of technical services like solid waste collection that can be characterized by high asset specificity and low need for redundancy. This study advocates that cooperation—meaning multiple principals—inhibits a service's capability to invest in asset specific capital goods. However, resources that exist in member municipalities independently of organizing have the potential to create scale benefits when being shared. But in this case, the number of principals needs to reach a certain point to be able to create this redundancy. We call for empirical studies on services with a variety of characteristics to check the robustness of these assumptions. We especially need to investigate services that score differently on these dimensions to better understand what determines different effects of cooperation. As pointed out earlier, the prevalence of shared service delivery span across a variety of service areas. Future studies should also examine tasks with low need for redundancy and asset specificity. An example of this is auditing services where there is very little uncertainty in demand, little need for investment in expensive transaction specific capital goods and low spatial dependency. Even so, this is—at least in the Norwegian context—a service field where approximately 80% of the municipalities have chosen to provide the service cooperatively (Monkerud et al., 2016). These different (transaction) framework conditions could indicate that such types of services could have greater possibilities to extract scale benefits. If we consider this study in comparison to former research, we can discuss the importance of differences in regulatory context. State regulations of the specific service area may hinder scale benefits linked to cooperation (Aldag et al., 2020; Blåka, 2017a). This taps into classical discussions of central versus local service regulation (Page, 1991; Rauch, 2008) and thus degrees of universalism (Titmuss & Seldon, 1968). Blåka (2017b) shows that for fire services, the more members who are included in a cooperation, the poorer the quality for each

member becomes. This is a service that are subject to more detailed state regulation while EPCs stand more freely in organizing their service offer (Blåka, 2017a, 2017b; Kiran et al., 2020; The Norwegian Medical Association, 2015). For instance, fire services are subject to stricter requirements than EPCs when it comes to maximum distances to inhabited areas making EPC less spatially dependent. Such factor may create greater possibilities for creating local gains from cooperation, setting the optimum scale of operation at a higher number of members than possible for more regulated services (Bel & Belerdas-Castro, 2021; Blåka, 2017a, 2017b).

This brings us to our final point in suggestions for future research. Our findings indicate that number of members in collaboration has more impact than the distinction between hierarchy and cooperation when it comes to access to labor. This means that how one chooses to organize cooperation is of great importance. Cooperation should not just be regarded as one uniform way of organizing but rather as a main mode that varies on several dimensions. The main structural element we have focused on here is size. The importance of cooperations' organizational form has also been emphasized in recent literature, both in the form of size (Blåka, 2017a, 2017b; Elston & Dixon, 2020; Sørensen, 2007) and formalization (Bel & Warner, 2015b; Blåka, 2017a; Voorn et al., 2019), and does in our case indicate that the form of cooperation may be of even greater importance than the traditional distinction between cooperating or not.

Because of the diverging results, this study indicates that the positive effects of cooperation are more limited than popularly assumed (e.g., Hulst & Van Montfort, 2007), making it important for policymakers to be cautious in their promotion of shared service reforms. As noted by Aldag et al. (2020, p. 286): *Shared services are no panacea*. It underlines a need for policymakers to be clear about the desired goals of cooperation (Aldag et al. (2020, p. 286)), given that the success of shared service delivery depends on (and vary between) type of service, type of performance, and organizational form (number of members) in the cooperation. Service sharing can lead to benefits of scale (the more the merrier) if the goal is to share resources that already exists in the member municipalities, but may not be suitable if the goal is to allocate new resources at the intermunicipal level.

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CONFLICT OF INTEREST

The authors declare that there is no potential conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data provided by National Centre for Emergency Primary Health Care are however not publicly available due to ethical restrictions.

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ENDNOTE

[1] The equation is $\Sigma(NP_i * POP_i)/POP_{tot}$, where NP_i = net profit (in percent) in municipality i, POPi = population in municipality i, POPtot = the sum of the population in the intermunicipal cooperation

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PAPER IV

Does cooperation affect service delivery costs? Privatization, cooperation and the optimum number of members in Norwegian local auditing services

Sara Blåka

Abstract

This study applies a transaction cost framework to analyze how mode of governance affects the cost of a service with task characteristics compatible with contracting, namely auditing services. We set out to determine (1) how organization in the form of contracting out and intermunicipal cooperation affect cost and (2) the optimum scale of operation (i.e., the number of cooperating members). The results indicate that cooperation in general is more costly than contracting out to private actors. However, when it comes to cooperation size, the results show that costs decrease when more members are included, indicating that smaller cooperations are more costly than larger ones. The results support classical transaction cost expectations and the notion that a service characterized by relatively low spatial dependency, frequency, complexity, and asset specificity makes the market the most cost-efficient mode of governance. It also shows that increase in cooperation size creates significant returns to scale.

Introduction

In recent decades, local governments have undergone transformations characterized by a greater diversity of organizational solutions to meet the increasing demand to deliver cost-effective services (Bel and Warner 2015). This has led to an increase in privatization and cooperative arrangements, which have supplemented the traditional hierarchical model (Williamson 1985, Williamson 1991). The use of privatization as a tool to lower costs has been a widely implemented policy globally (Bel and Belerdas-Castro 2021). However, studies have shown that the effects are mixed, as many small municipalities find that increasing

transaction costs outweighs efficiency gains from outsourcing (Bel and Miralles 2003, Bel and Warner 2015). Intermunicipal cooperation (IMC) is also a widespread strategy for creating economies of scale and thus lowering production costs for cooperating members. The literature is also inconclusive regarding cooperation's effect on production costs (Bel and Sebő 2021). Given this inconclusiveness regarding outcomes and mode of governance, scholars argue that more attention should be given to differences between services, how IMC is organized and how they affect performance (Blåka 2017a, Blåka et al. 2021). One organizational dimension that previous studies have stressed is cooperation size and how the number of cooperating owners may cause problems with dispersed ownership (Sørensen 2007) and multiple principals (Young et al. 2008). Studies on alternative forms of service provision should not be restricted to modes of governance; they should also explore how the number of governing actors affects performance. Even though we know from the literature that cooperation may lead to economies of scale (Hulst, Montfort et al. 2009, Bel and Warner 2014, Bel and Warner 2015), the governance of cooperation may lead to inefficiencies due to problems of collective action (Feiock 2007, Feiock 2009) and multiple principal problems (Voorn, van Genugten et al. 2019). Prior research on services characterized by a need for redundancy and asset specificity has shown that the number of partners in a cooperation has a significant effect on its performance (Blåka 2017a, 2017b, Elston and Dixon 2020). Some studies have shown that the impact of the number of partners, or principals, is more important than the impact of different modes of governance (Sørensen 2007, Blåka et al. 2021). This suggests a need to further explore the dimension of number of principals within the interorganizational mode. Like Bel and Belerdas-Castro (2021, 5), we argue that 'the potential effects of cooperation likely differ across services, because the optimal scale is different for each one'. This coincides with Hulst et al. (2009), who argue that 'every service has an optimum scale of operation, i.e. a scale on which the service can be rendered in the required

variety and quality at the lowest production cost'. This builds on the work of Ellinor Ostrom (1976), who argued that the appropriate scale depends on the good considered and the people jointly affected (see also Blåka 2017b). Therefore, there is a need for empirical studies on service areas with different task characteristics than those examined in previous studies. In this study, we focus on auditing, a service characterized by lower asset specificity, redundancy and spatial dependence than the more often studied service types, such as fire services and refuse collection (Blåka 2017a, Aldag, Warner et al. 2020).

In this study, we hold the potential scale economies in single municipalities constant and focus on how governance affects cost. Our aim is thus to provide new insight into how intermunicipal cooperation affects cost by a) comparing intermunicipal cooperation with outsourcing to private actors and b) exploring how the number of members in each cooperation affects cost, which will enable us to detect whether there is an optimum cooperation size. By studying auditing services, we also extend the empirical ground to a type of service that differs significantly in task characteristics from services that previously have been studied (Blåka et al. 2021).

Intermunicipal cooperation, privatization and cost

Intermunicipal cooperation is widespread and often presented as something that combines the 'best of both worlds' (Hulst and Van Montfort 2007). It aspires to create both economies of scale and reap the democratic gains of small communities (Baldersheim and Rose 2010, Hulst and van Montfort 2012). Even considering the long history of practicing shared service delivery (Ostrom, Tiebout et al. 1961) IMC has received far less attention than privatization, and the literature is still thin and inconclusive with respect to cost evaluation (Bel and Warner 2015, Blåka 2017a, Bel and Belerdas-Castro 2021).

Williamson (1975, 1991) divides the structuring of the provision of public services into three modes: market, hierarchy and hybrid (network) forms of governance. In this study, we focus on the effects of a hybrid versus the market mode. While market refers to outsourcing ('buying'), the hybrid mode refers to 'relational contracting' (Williamson 1985) – an interorganizational relation, which in this case is a situation wherein two or more municipalities pool their resources to solve a common task or challenge (Hülst and Montfort 2012, Bel and Warner 2014, Jacobsen Forthcoming).

A main expectation when using privatization policies has been to save costs (Bel and Fageda 2007). Rationales for this are grounded in economic theories according to which the introduction of the market counteracts bureaucrats' self-interest in budget maximization (Buchanan and Tullock 1965, Stigler 1971) and reduces oversupply by making public services more cost efficient (Niskanen 1971, Shleifer and Vishny 1997). Though the theoretical expectations are clear, 'the most recent empirical studies on privatization and costs tend to find no systematic association between them, and the results are largely dependent on the specific case.' (Bel and Belerdas-Castro 2021 p. 1). The reasons for problems with privatization may lie in the absence of market and real competition in small and rural municipalities. This is especially expected to be valid for services with high geographical dependence (Bel and Warner 2015, Blåka et al. 2021) and underlines the need for research that differentiates between different types of cases and thus examines variation in the dimensions of service characteristics and organizational form. We also need to examine services with other task characteristics, such as the need for physical proximity, than those of previously studied service types.

When it comes to shared service delivery, the drivers have focused both on cost efficiency and broader measures of performance (Hülst and Montfort 2007, Aldag, Warner et al. 2020, Blåka et al. 2021). The main rationale for expecting IMC to increase performance lies in

possibilities for creating scale benefits. Bel and Belerdas-Castro (2021) summarize how small

size can arguably inhibit possibilities of creating economies of scale in public service delivery

(i.e., Mirrlees 1972, Dixit 1973). However, as for privatization, empirical studies have shown

that the effects of cooperation on cost diverge (Bel and Sebő 2021), and scholars have started

asking whether this is because the effects of cooperation depend on the type services being

shared and how the cooperation is organized (Aldag, Warner et al. 2020).

Task characteristics

Transaction costs theory provides a framework for considering a task's feasibility for being

subject to production by hierarchy, market or hybrid forms of governance (Williamson 1999),

with hierarchy indicating the highest level of integration and market indicating the lowest.

These are related to the following service characteristics: *asset specificity, frequency,*

complexity, geographical dependence and *uncertainty* (see for instance Brown and Potoski

2003, Brown and Potoski 2005, Blåka 2017b, Bel and Belerdas-Castro 2021). Asset

specificity emphasizes to what degree investments can be exploited beyond the specific

service field (Brown and Potoski 2005). The lower the possibility for exploitation beyond the

specific service, the higher the incentive to cooperate by sharing investment costs, and the

higher the likelihood of monopoly markets (Brown and Potoski 2005). Cooperation will here

arguably be more feasible than the market. An example of services that score high here are

emergency services that highly depend on capital goods such as buildings and vehicles as well

as a highly trained work force that, to a very limited degree, can be used for other purposes.

Somewhat differently, we find auditing services that are less dependent on capital goods

specific to the service and thus costly service-specific investments but that do rely on highly

educated personnel (Blåka et al. 2021). Frequency refers to how often the service is utilized.

The higher the frequency, the more incentive to integrate the production (Williamson 1999).

Here we can differentiate between solid waste disposal on the one hand, which works

continuously – indicating high frequency – and auditing services on the other hand, where the work is demanded less frequently but concentrated during annual accounts. Uncertainty refers to a service fluctuation in demand. Some tasks, such as emergency care, need fail-safe service delivery and will therefore have to provide capacity that on a regular basis is redundant. Auditing, by contrast, has a low need for redundancy. The higher the need for excess capacity, the greater the expected possibility of gaining scale benefits from cooperation. Another main dimension in characterizing a service contractability is ease of measurement – or complexity. According to Brown and Potoski (2005 p. 327), '*the costs of negotiating, implementing, monitoring, and enforcing contracts are higher when services have outcomes that are difficult to measure*'. Here, we can argue that it is more difficult to measure and contract, for instance, one unit of fire prevention emergency care service than one unit of audit service (Hulst and Van Montfort 2007, Jacobsen Forthcoming). Lastly, as mentioned earlier, services also differ in their demand for physical proximity. This indicates the geographical dependence between service and user. An example here is home-based care, where the service is provided at each user's residence (Jacobsen Forthcoming). Services such as fire protection and refuse collection also score high in this dimension, while administrative services such as tax collection, accounting and auditing have a lower score. A low score gives greater possibilities for centralization and use of private providers. Therefore, low spatial dependence may facilitate both the use of market and potential scale benefits linked to cooperation (Williamson 1999, Blåka 2017a, 2017b, Bel and Belerdas-Castro 2021, Blåka et al. 2021). We can thus argue that auditing services are characterized by low *uncertainty*, geographical dependency, *frequency, complexity* and *asset specificity*, indicating a relatively low need for integration, and thus with characteristics that are feasible for using both the market and hybrid modes. A low score in all service-characterizing dimensions makes the service compatible with contracting. However, it may also facilitate economies of scale due to shared service delivery.

The earlier divergence in empirical results makes this more of an open research question. Are cooperations able to realize scale benefits, or does the contractability and thus competition mechanism of the market enable the lowest cost? We therefore seek to examine the following research question empirically:

Question 1: Do intermunicipal cooperation and privatization affect costs differently?

Organization of cooperation – the multiple principal problem

Another branch of the economically oriented organizational theory is the principal agent framework (Fama and Jensen 1983). It refers to structures wherein the provider (agent) is separated from the purchaser (principal). The agent can be defined as a private actor or a semi-autonomous unit within the public sector. IMC lets us focus on the principal–principal perspective (Young et al. 2008) wherein shared service delivery assumes the inclusion of at least two owner municipalities (principals). As previously noted, one of the main aims of cooperation is to increase production volume to obtain economies of scale (Blåka et al. 2021). Detecting the optimal scale of public service delivery is a classical subject within the field of local government studies (Hirsch 1959, Oates 1972, Dixit 1973), usually with a focus on population size and dispersion (Deller 1992, Ladd 1992). By focusing on the governance of cooperation, holding dispersion and populations in single jurisdictions constant, we investigate possible problems that shared service delivery may activate, namely dispersion of ownership and multiple principal problems. According to Voorn, van Genugten et al. (2019), multiple principals may impair performance. Reasons for this may lie in coordination problems such as weaker incentive schemes for agents (Bernheim and Whinston 1986, Martimort 1992, Stole 1997, Dixit 2002), problems with accountability (Schillemans and Bovens 2011) or goal incongruence (Young, Peng et al. 2002). Multiple principals may thus raise agency costs and bring a larger wealth transfer from principals to agents than would occur under one principal (Voorn, van Genugten et al. 2019 p 678). Prior studies on tasks with

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high asset specificity and spatial dependency, in the Norwegian context, have shown that performance decreases linearly with each member that is included in the cooperation (Sørensen 2007, Blåka 2017, Blåka 2017, Blåka et al. 2021). We investigate whether this is the case also for services that differ largely in task characteristics from previously studied services. In the previous section, we outlined how administrative services such as auditing possess characteristics that can allow them to benefit from scale linked to cooperation. The transaction cost expectation is that services characterized by ease of measurement, low frequency and low spatial dependence have the potential to extract returns to scale. We therefore seek to investigate the validity of multiple principal problems. We ask whether multiple principal problems also apply here or whether this is a service that can benefit from larger scale by posing the following question:

Question 2: How does the number of members influence costs?

Study setting

Norwegian municipalities are mandated to have a control committee appointed by their municipal council. This committee handles financial and performance audits, which they report to the municipal council (Johnsen 2021). The municipal council should be represented in the control committee with a minimum of one member, and the leader is usually a representative from the political opposition (Blåka, Tjerbo et al. 2012). Financial audit refers, in short, to the activity wherein the auditor assesses whether a municipality's annual accounts have been prepared in accordance with laws and regulations. Performance auditing refers to auditors conducting systematic assessments of finances, productivity, goal achievement and effects based on the municipal council's decisions.[1]

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[1] Regulations on auditing in municipalities and county municipalities. LOV-1992-09-25-107-§78, LOV-1992-09-25-107-§79

After solid waste services, audit is the task that is most frequently subject to cooperation, with over 80 percent of municipalities choosing this as the organizational solution. These cooperations have almost exclusively been organized as IMCs with their own IMC organizations (Monkerud et al. 2016). The most used legal form is intermunicipal auditing companies, which is its own legal entity and where municipal participants govern through ownership. Few provide auditing single-municipally. The modes are either IMC or privatization. Private providers are normally large accounting companies. Despite differences in organizational modes, the mandatory audit service is considered uniform because auditors apply the same financial standards (Leirvik 2006). Both IMC and privatization entail providing auditing through a different autonomous actor. The service is thus regulated by a contract. In the case of IMC, members create a joint company agreement that regulates the owners' obligations (economical and others) to the company. IMC is thus an agreement to cooperate and share production expenses, while the market contract is a purchase and sale agreement. A contract with private providers can be divided into two parts. (1) a basic agreement ('*rammeavtale*'), which is calculated according to the highest estimated value of all expected work throughout the term of the agreement, and (2) a 'contract of option' (*opsjon*), wherein the provider calculates an acquisition (for financial or performance auditing) that can be acquired for a contracted purchase price (Olsen et al. 2012).

Data

The independent variables are drawn from the Norwegian Association of Municipal Auditors register of organizing municipal auditing services. The dependent variable, controls and instrument variables are provided by Statistics Norway and Fiva, Halse et al. (2020). This study analyses the effects of IMC versus private service provision on each municipality's auditing costs. The level of analysis is thus each municipality.

The dependent variable is measured using Statistics Norway's data on municipal auditing cost, which the municipalities report in the municipal-to-central-government reporting system (KOSTRA). It measures the total operating cost per capita for each municipality's mandatory accounting, management auditing and expenses linked to the municipal control committee. Like Johnsen (2021), we argue that including the cost of the control committee and its secretariat provides a better reflection of municipalities' possible transaction costs than solely measuring production costs.

We use data from the Norwegian Association of Municipal Auditors register of organizing municipal audit services to measure the independent variables. The register provides information on whether municipalities outsource the provision of auditing services to private companies, engage in IMC or provide it themselves. Approximately 12 percent of the municipalities in Norway have chosen to privatize. The most frequently used private providers are the large companies KMPD, Deloitte and BDO. As previously mentioned, auditing is a service that few provide within their own organization (Leknes et al. 2013). Our aim is to compare the modes of privatization and cooperation. In our material, only three municipalities provide the service by themselves (by hierarchy). These three have been removed from the analyses. One municipality is registered with a hybrid solution (both privatizing and providing the service themselves). This municipality has also been excluded from the analyses. The rest (approximately 88 percent) provide auditing through cooperation. Hulst et al. (2009) state that shared service delivery across Europe is characterized by great diversity. The organizations vary with respect to the number of participants and the number of services they provide. We can see that this is also the case in the Norwegian context. In their mapping of 750 Norwegian IMCs, Leknes et al. (2013) showed that there is large variation in the number of members in each cooperation, spanning from two participants to nearly 50 members in the largest ones. Unfortunately, we have been unable to locate similar mappings

on a European level. Cooperation in the context of auditing is highly formalized through joint organizations (see Blåka 2017a for a more thorough description of the empirical differences between joint organizations and contractual agreements). They are also characterized by being larger in terms of members than what we see in some other service areas. The range of members goes from 4 to 53 members, with a mean of 21 members. Leknes et al. (2013) also show that formalization ('corporatization') correlates positively with the number of members, which – in line with classical organizational theory – indicates that large organizations (in our case, cooperations) tend to formalize more than smaller ones.

When measuring cooperation versus private service provision, municipalities that provide their auditing by cooperating with other municipalities are coded 1, while municipalities that buy auditing services from private providers are coded 0. When measuring the number of members, municipalities that do not cooperate but use private providers are coded 0. The municipalities that cooperate are coded with the number of members in their cooperation – ranging from 4 (which represents the smallest cooperation in terms of members) to 53 (which represents the largest cooperation in terms of members).

Following earlier research practice, we use three control variables, which we expect to have a great influence on actual cost. First, we expect that production volume may affect cost. Larger municipalities will have better opportunities to exploit economies of scale than smaller ones that may suffer from having small production units (Deller 1992, Ladd 1992, Petersen, Houlberg et al. 2015). We operationalize this by using each municipality's population (log transformed). Second, one can expect that population density may affect the complexity of the municipal organization, which again can drive up auditing costs because complex organizations are more costly to audit than simpler ones (Aldag, Warner et al. 2020, Johnsen 2021). We measure population density with inhabitants per square mile for each municipality. Third, a municipality's general economy may affect its spending on service delivery.

Following Blåka (2017a), we argue that the wealthier the municipality is, the more it spends on service provision compared to poorer municipalities, independent of how they organize the service provision. We measure this variable using each municipality's 'free revenue per capita (NOK)', which is computed by Statistics Norway. One factor that we do not control for in this study, due to a lack of data, is possible variations in the quality of auditing services. Even though municipal auditing is centrally regulated through minimum requirements (accountants require state authorization) (Indset and Tjerbo 2011), we cannot exclude the possibility that factors such as auditor identity and experience may also affect cost (Johnsen 2021). The results should be interpreted with this limitation in mind. Another issue that needs to be made explicit is the interpretation of the concept of economies of scale. This is a study on how organizational form affects spending on the (member) organizational level. An often used definition and measurement is that '*economies of scale exist when average cost decreases as production increases*' (Bel and Warner 2015, 55). Returns to scale may also occur when a cost reduction is due to the fixed cost being spread across a larger number of users. Our empirical study builds on earlier research that measured cost and, thus, possible returns to scale by each municipality's cost per capita (see Sørensen 2007, Blåka 2017a). One of the most important drivers for municipalities when engaging in IMC is the achievement of optimal boundary levels with the lowest cost for the provision of a given service (Bel and Sebő 2021). What this study examines empirically is what happens when comparable costs are spread over several member organizations or outsourced to private providers.

Empirical strategy

An important methodological challenge in this study is the potential problem of reverse causality. We hypothesize that the organizational form of service provision affects cost, but we cannot exclude the possibility that cost may affect a municipality's choice of organizational form, which makes our dependent variables endogenous since they might be

correlated with the error term. To counter this problem, we implemented an instrument variable strategy. This entails using a two-stage least square regression, where in the first stage, we regress the possible endogenous variables with a set of instruments and then use the predicted values from the first stage instead of the independent variables (Blåka et al. 2021).

We rely on four instruments for these analyses. The first three variables instrument the choice of organizational mode and the fourth instruments number of members. The first two measure the municipalities' experience with privatization and cooperation. (1) Share of health care services purchased from private providers. This shows the percentage each municipality has used for privatization of health care services. Health care is the largest municipal service area and a type of service wherein privatization is politicized (Blåka et. al 2013). Our hypothesis is that the more experience, and thus the higher share municipalities have with privatizing health care services, the more likely it is that they also privatize audit services. (2) Experience with cooperation. The next instrument variable measures to what extent a municipality has experience with intermunicipal cooperation within water, sewerage and waste management. These are services that have significant variation when it comes to whether municipalities cooperate or not (Monkerud et al. 2016). The variable goes from 0 (does not cooperate on any of these tasks) to 3 (cooperates on all these tasks). The expectation here is that the more experience each municipality has with cooperation, and the closer their collaborative relationships with other municipalities, the higher the probability that they also cooperate in the provision of audit services (in line with Kwon and Feiock 2010, Rubado 2021). (3) County administration. This variable measures whether the municipality is the regional centre. Here, the expectation is that the municipalities that hold the county administration often take on a 'big brother' role for the surrounding municipalities (Leknes et al. 2013). It is therefore likely that such municipalities are involved in intermunicipal cooperation. (4) Vote share to left-wing parties. A municipality's share of left-wing votes

captures its willingness to cooperate – something we expect affects both whether they cooperate and how many members they attract. A municipality with high support on the left is more likely to be a driving force in cooperation, just as right-wing governments tend to be associated with private production (Bel, Fageda et al. 2014). Left-wing governments in this sense measure the climate for cooperation, indicating that the more concentrated the left-wing share is, the higher its motivation to attract intermunicipal members. All instruments show significant results in the hypothesized direction. Table 1 provides an overview of the variables used in the analyses and their summary statistics.

Table 1 approximately here*

Table 1 Descriptive statistics*

	Source	N	Mean	SD	Minimum	Maximum
Dependent variable						
Operational cost per capita (NOK)	Statistics Norway	339	.26	.24	.007	2.16
Independent variables						
Intermunicipal cooperation	The Norwegian Association of Municipal Auditors	352	.88	.32	0	1
Number of members		352	21.12	16.91	0	53
Control variables						
Free revenues per capita	Statistics Norway	339	69199.94	15226.83	39520	184589
Population (log transformed)		356	8.67	1.28	5.29	13.45

Population density (inhabitants per square mile)		356	.28	.44	.0006	3.08
Instrument variables						
Percentage spending used on private health care		356	7.03	5.44	0	52.88
IMC in water, drainage and solid waste management		357	1.14	.78	0	3
Vote share left-wing parties	Fiva, Halse et al. (2020)	345	.37	.13	0	.81
County administration		357	.05	.21	0	1

*All variables are from 2020, except for 'Vote share left-wing parties' which measures vote share from the last local election (2019). Some municipalities underwent mergers with other municipalities between 2019 and 2020. For these municipalities, we have used the mean value share from each municipality before the merger.

Estimation results

The estimates follow the standards set by Blåka (2017a, 2017b) and Blåka et al. (2021). The results from the second stage of the instrument analyses, which apply the predicted values of the first-stage regression, are presented in Table 2. The analyses are run in two models. In model 1, we estimate the general effect of cooperation versus private service provision on audit cost per capita. In model 2, we include the number of cooperating partners. This variable shows the effect of increasing cooperation by one more member. To clarify the effects of the number of members, we have included a graphical figure (Figure 1) that estimates the

marginal effect of increasing members on costs. It shows the marginal effect of going from

privatization to cooperation (shown from 0 to 4 in the figure) and stays fixed after that –

showing the marginal effect including additional members.

Table 2. Empirical results from the estimation of the determinants of operational cost per capita.

	Model 1: Mode of governance: private provider or IMC	*Model 2: Mode of governance and number of members in cooperation*
Intermunicipal cooperation	.18 (.1)*	.30 (.1459392)**
Number of members		-.003 (.002)
Free revenues per capita	9.35 (9.8)***	9.62 (1.1)***
Population (log transformed)[2]	-.04 (.0)***	-.10 (.0)***
Population density	.04 (.0)*	.10 (.0)**
N	325	325
F-value	185.88	129.34
Underidentification test (Anderson canon. corr. LM statistic) Chi-sq(2)	14.822***	11.470***
Overidentification test of all instruments (Sargan statistic) Chi-sq(1)	2.963	0.789
VIF (mean)	2.99	3.35

Note: *** indicates significance at 1% level, ** at 5% level and * at 10% level. Robust standard errors in parentheses.

The results from model 1 show that cooperation has a positive effect on cost, indicating that

cooperation is generally more costly than buying audit services from private firms. Model 2

shows the same tendency for the dichotomous variable but does not turn out to be significant

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[2] This variable measures population logs for each municipality (as done in Bel and Costas 2021; Blåka 2017a). We have also tried running the analyses using the population size of region covered by the intermunicipal or single municipality privatizing the service. Here the IVVIF from the IV-estimation gave IVVIF values significantly higher than the cut-off value of 10, indicating that it is not possible to clearly separate the effects of number of members from the population size of the intermunicipal service area.

for number of members. Figure 1 does, however, provide us with some important nuance regarding the general effect of cooperation versus privatization. The marginal effect shows that small cooperations (in terms of members) have significantly higher costs than large cooperations, but the costs gradually decrease as more members are included, until the difference disappears at approximately 35 members.

Figure 1 approximately here*

Figure 1: The effect of cooperation versus single municipality (from 0 to 4) and the marginal effect of number of members (from 4 to 53) on cost.
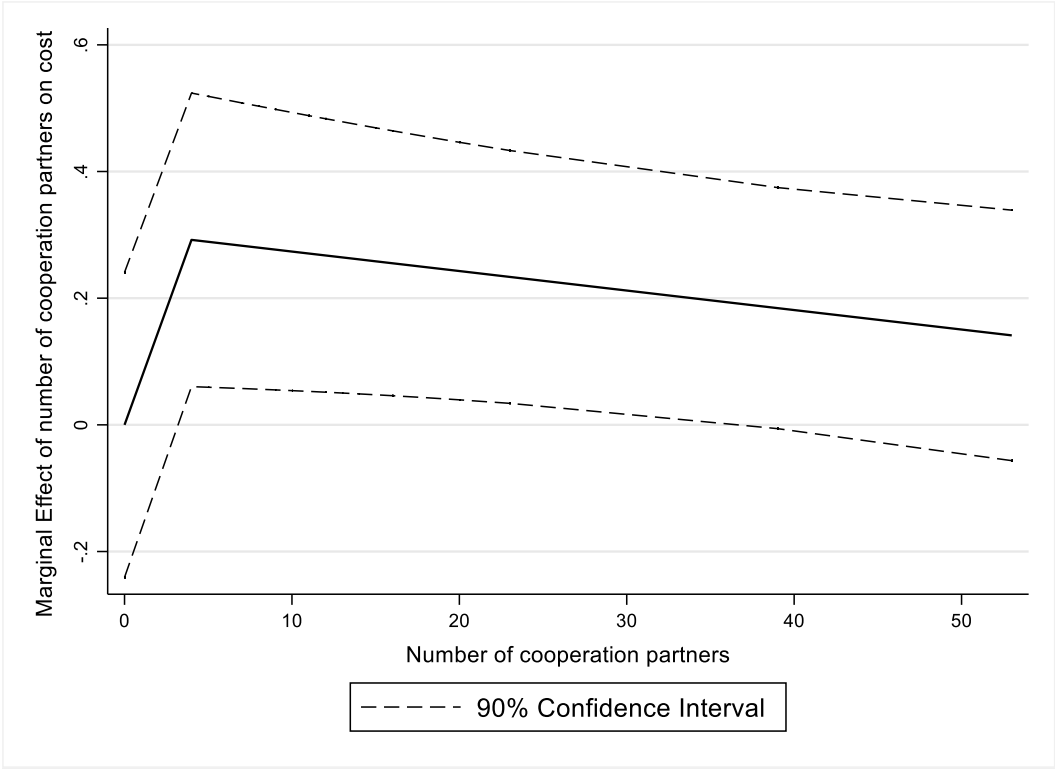
Discussion

We started this study by asking whether mode of governance affects auditing costs, which is an administrative service characterized by low complexity, spatial dependency, frequency and asset specificity. The results show that cooperation affects cost positively, indicating that shared service provision is more costly than contracting out to private providers. This finding

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supports the transaction cost notion that market mechanisms lower prices more than the hybrid (network) mode enables. It provides evidence that this is a type of service that is feasible with non-integrated service delivery, at least when the performance measurement is the amount of spending.

This effect is stable even when we open the 'black box' of cooperation size and measure the effect of the number of members in cooperation. Service provided by contract is always more cost efficient – no matter the size of the cooperation. The effect of the number of members does, however, provide some nuance to our picture by showing that costs decrease as the number of members rises. It answers question number two: How does the number of members influence costs? The answer is that costs decrease as the number of members increases. Providing audit through smaller cooperations is thus more costly than providing it through larger ones, in terms of members. We can argue that – at least for this type of service – there is an economy of scale linked to the number of partners. The cooperation needs to reach a certain size (in our case, up to approximately 35 members) before it becomes optimal. This contradicts the general expectation derived from agency theory: an increase in principals does not increase multiple principal problems that lead to poor performance. Our results differ largely from earlier empirical findings in the context of fire services and refuse collection. In these services, the results are the opposite, showing that when more members are included, costs increase (Sørensen 2007, Blåka 2017a). This divergence coincides, however, with studies that claim that the effect cooperation has on cost depends on what task is being shared (Aldag, Warner et al. 2020). This builds on classical assumptions within economic governance (Ostrom 1976) and suggests that the effects of the market or cooperation size may not be universal; rather, they may depend on the specific properties of the services. We argue that some characteristics make services a better fit for extracting economies of scale than others and thus are subject to lower transaction costs due to cooperation.

As described earlier, the transaction cost framework provides us with a basis for categorizing types of services' feasibilities for contract and cooperation. The assumption is that tasks with different characteristics require different governance structures to perform optimally. We outlined the following four dimensions: asset specificity, frequency, spatial dependency, and complexity (ease of measurability), where low scores indicate that a service is ideal for contracting and may also extract economies of scale via cooperation. We argue that this study is generalizable for this specific type of task.

In contrast to the previously studied services mentioned above, auditing is an administrative task, in line with municipal procurement, ICT, planning and accounting, which are not aimed at service provision to the public directly, but at the municipal organization. It is characterized by a low need for physical proximity, which we see opens up the use of large market actors (in our case BDO, KMPG and Deloitte) that are not necessarily located near buyer municipalities. This low need for proximity also enables centralization and extraction of economies of scale in larger intermunicipal units. Emergency services, such as firefighting, are, by contrast, directly provided to citizens and are characterized by centrally defined spatial regulations when it comes to maximum emergency response time (Blåka 2017a, 2017b, Bel and Belerdas-Castro 2021). This may contribute to inhibiting the extraction of economies of scale due to cooperation size and, in many cases, increased costs (Sørensen 2007, Blåka 2017a).

Auditing, alongside other administrative services, is also not characterized by the same asset specificity as the more technical services, such as refuse collection or firefighting. The low need for investments in expensive capital goods that cannot be used beyond the specific service contributes to preventing monopoly markets and facilitates competition. These administrative services are often also characterized by lower complexity and are easier to measure and thus contract than more citizen-oriented services (Brown and Potoski 2005).

Within the two modes, our findings indicate that the market – and thus the contract between buyer and seller where the price of the service is fixed – is less costly than a co-production agreement between municipalities. This suggests that this is a type of service that enables easy gauging of quantity, that facilitates competition in the market that minimizes slack and that leads to economic discipline in production. Buying is in this case cheaper than (co)producing. We can also discuss whether the observed returns to scale caused by an increase in the number of members is due to this ease of measurement. Services that are measurable are also arguably easier to divide between partners (Bel and Warner, 2015; Feiock, 2013). In auditing services, the economic benefits of scale exceed transaction costs and multiple principal problems linked to cooperation. Economies of density describe an economic characteristic where a service experiences cost savings due to spatial proximity between inhabitants and the service. This study suggests that a service not characterized by a need for physical proximity can exploit returns to scale based on economies of dispersion. The low spatial dependency facilitates economic gain in spreading costs to a larger number of members. Bel and Warner (2015, 55) emphasize the need to pay attention to the economic characteristics of the service, as different services will exhibit different conditions of delivery to exploit returns to scale. A production's fixed cost refers to expenses that must be covered independently of the service production frequency. In services characterized by low frequency, small-scale cooperations may be unable to extract the full potential of service production capacity (Jacobsen, Forthcoming). We argue that the cost reduction linked to the increasing number of members in auditing can be explained by personnel capacity that is better utilized in numerous cooperations.

Even though we may argue that auditing is a service that is easier to measure and thus contract than many other more citizen-directed services, we do not measure the possibility of variations in the production of performance auditing. We do not have information on whether

co-production and buying affect the quality of service. Instead, we control for conditions that we expect to have an impact on production volume and complexity. The results should, however, be interpreted with this possible limitation in mind.

Conclusion and suggestions for future research

This study provides evidence that mode of governance affects cost. Purchase from the market is less costly than cooperation and exceeds any economical (scale) benefit from shared service delivery. Future research should further examine the assumptions outlined in this paper. Our interpretation of the results suggests that the possibility of extracting economies of scale depends on service characteristics and thereby supports classical transaction costs hypotheses.

The findings contradict comparable studies on how the number of municipalities in cooperation affects more citizen-oriented tasks and challenge assumptions that consider cooperation more of a general effect. Like other comparable studies, it provides insight into how the organizing of IMC affects cost and how this effect may vary between types of tasks. We argue that there is a need for more empirical studies on tasks that score differently on transaction cost dimensions than studied in previous research. The conclusion that administrative services characterized by a low need for geographical proximity, asset specificity, frequency and complexity are more suitable for contracting needs further empirical scrutiny. The same goes for the validity of the claim that for these service-specific characteristics, the benefits of scale exceed transaction costs and multiple principal problems linked to cooperation. One way of examining this would be to execute empirical work on administrative services such as public procurement, ICT and accounting to further check the validity of the findings for tasks with the reviewed characteristics. As pointed out earlier, previous studies on the effects of IMC have mostly concentrated on technical services, which in most European cases means studies on refuse collection (Bel and Sebő 2021). We, along with other scholars (Blåka 2017b, Arntsen, Torjesen et al. 2021), call for similar research on

more 'human processing' services, such as health care, education, and social services, where cooperation today is widespread (Hulst and Van Montfort 2007, Leknes, Gjertsen et al. 2013), even though many of the services are highly spatially dependent, frequent and measurement is complex (Thompson 1967, Brown and Potoski 2005). Although service sharing may have a broad set of goals, we can expect economies of scale due to cooperation in these settings to be limited, and costs may even increase (Blåka 2017a, Aldag, Warner et al. 2020). We thus acknowledge a need for further studies that can enable us to better differentiate between forms of cooperation and services with different characteristics to better explain how differences in mode, size and task characteristics affect performance. Studies that manage to analyze this holistically would be fruitful both for researchers and practitioners in search of successful organizational forms for specific types of services. This type of research would provide much needed knowledge about the conditions under which each governance mode or organizational form of cooperation is likely to be successful.

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