08/25

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Public Investment Support in Rights-Based Fisheries: Evidence from Norway

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SNF Working Paper No. 08/25

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SNF Project No. 10030:
DistRes – Distribution and resource rent in fisheries

The project is financed by The Research Council of Norway
(Project No.: 295197)

CENTRE FOR APPLIED RESEARCH AT NHH
BERGEN, DECEMBER 2025
ISSN 2704-0380 (Online)

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Abstract

As technological change and market-based management systems reshape the fishing industry, many coastal communities face mounting challenges. Public investment subsidies are one potential policy response, yet little is known about their scale, allocation, or relationship to resource ownership in regulated fisheries. In this paper, I address this gap by constructing a novel dataset covering municipal and state-level grants to the Norwegian fishing industry and linking these records with detailed register data on quota holdings. Using this dataset, I document the magnitude, composition, and spatial distribution of subsidies across Norwegian municipalities from 2001 to 2019 and explore correlations with quota ownership. Municipal transfers totaled roughly NOK 200 million, concentrated in rural areas and dominated by grants for vessel and quota purchases. Subsidy provision and quota ownership co–move in coastal fisheries, while fiscal health plays only a minor role. As an illustrative case of the influence of subsidy eligibility on quota ownership, I examine a revision of Norway's regional aid area, which removed several coastal municipalities from eligibility for general investment support. Results—indicative rather than conclusive—suggest a possible decline in quota holdings in the coastal cod fishery following the reform. In sum, the paper provides an empirical foundation for understanding how local governments use targeted investment subsidies under rights–based fisheries management.

Keywords: Fisheries; public subsidies; regional development

JEL Codes: H71; Q22; R12

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1 Introduction

Coastal communities are facing decline as technological progress and market–based management programs reshape the commercial fishing industry. A key driver of this transformation is consolidation, reflected in the geographic concentration of firms and quota holdings, and a reduction in participating fishers and vessels.[1] The trend is likely to continue globally as technology advances and more countries adopt catch shares and similar market–based management systems. For rural coastal communities where fishing activity is geographically rooted and accounts for a large share of local economic activity, this shift poses serious challenges. In response, national policy makers have incorporated social objectives into the management programs,[2] while local governments that are highly dependent on the industry for employment and revenue face strong incentives to adopt fiscal measures such as investment subsidies to sustain regional economic activity. However, the scope of subsidies provided by local governments to the fishing industry is not well documented.

This is problematic for several reasons. First, there is little empirical knowledge of the ability of investment subsidies to promote economic activity because they often target industries and firms in decline. A more general concern is that subsidies may finance activities that the firms would have undertaken anyway, thereby crowding out more productive uses of public funds. In financially struggling coastal communities, the opportunity cost could be especially high. Further, when production is capped at the industry level, for instance through total allowable catch, subsidies will reallocate economic activity across regions without increasing aggregate output. Lastly, subsidizing investments in tradable production permits, such as catch shares, can inflate prices and distort efficient allocation, undermining the efficiency gains typically associated with rights-based management systems. Despite the theoretical drawbacks of public investment subsidies in regulated natural resource industries, there is little empirical evidence of their extent and effect. For fisheries, the knowledge gap is particularly striking given the global shift toward market-based management and privatization of harvesting rights, which has been accompanied by an increase in policy instruments aimed at mitigating adverse effects on local communities by, for instance, promoting local ownership of fish stocks. In Norway, for example, fishers can apply for funding from state and municipal sources to invest in vessels, gear, and for fishing quotas in catch share-regulated fisheries. However, the scope of public funding and its effect on resource ownership remain unclear both in Norway and elsewhere.

In this paper, I address this knowledge gap by examining the case of public investment subsidies to the fishing industry in Norway. I construct a novel and comprehensive dataset that links all municipal development grants and state–level subsidies to the industry from 2001–2019 with detailed register data on resident quota ownership in select catch-share regulated fisheries. I use this dataset to undertake two complementary analyses. First, I document the scale, composition, and spatial distribution of subsidies across Norwegian municipalities, providing an overview of which municipalities allocate funding, how these flows evolve over time, and their relation to local economic and geographic characteristics. Second, I exploit a revision of Norway's regional aid area—which in 2014 made public investment support unavailable in a small number of western municipalities—to study how a general reduction in subsidy availability affected quota ownership in the coastal cod fishery. Together, these analyses provide an initial empirical account of public investment subsidies to the Norwegian fisheries industry, offering a first step toward understanding patterns of public subsidy provision and their possible relationship to resource ownership.

My analysis documents a substantial flow of public investment subsidies to the fishing industry. State aid for purchasing vessels and quotas totaled 17 billion NOK over the period 2001–2017, while 173 Norwegian municipalities paid out just under 200 million NOK—about 132 NOK per capita annually—with vessel and quota investments accounting for the largest share. These transfers exhibit pronounced spatial and temporal variation: rural municipalities, especially in northern clusters, provided significantly higher per capita amounts. Funding levels peaked in the period 2008-2014, coinciding with the expansion of the structural quota system. Correlation patterns suggest that municipal finances play only a minor role in explaining subsidy provision, while subsidy activity appears to be associated with quota holdings in coastal fisheries. Municipalities that allocated more subsidies over the full period tended to experience a decline in quota hold-

[1] See Abe et al. (2024), Cojocaru et al. (2019), Abayomi and Yandle (2012), and Agnarsson et al. (2016)
[2] See e.g. Kroetz, Sanchirico, et al. (2015) and Kroetz, Nøstbakken, et al. (2022)

ings. Finally, the analysis of the 2014 policy change suggest that removing municipalities from the regional aid area may have had a negative impact on quota holdings in the coastal cod fishery, though inference is fragile due to the low number of treated municipalities. The results from the case study should therefore be interpreted with caution and regarded as a case study rather than generalizable evidence.

My study complements the literature on global fisheries subsidies (e.g., Sumaila et al., 2019; Schuhbauer et al., 2020), which primarily focuses on capacity–enhancing subsidies from national governments and their negative impact on biological and economic sustainability in open–access fisheries. In contrast, I focus on subsidies from local governments in catch-share regulated fisheries, where biological sustainability is less at risk (Sakai, 2017), and overcapacity seldom a problem (Birkenbach et al., 2017), but where fiscal transfers can still distort market outcomes. Subsidies for quota and vessels purchases—which are not well documented in the literature—are particularly consequential, as they can inflate quota prices, promote ownership concentration among firms with access to public funds, and amplify beggar–thy–neighbor dynamics familiar from the literature on regional fiscal competition (Ferrari and Ossa, 2023). These issues will likely become more pressing as open-access institutions decline. Against this backdrop, and in light of ongoing debates on subsidy reform and management design (Costello, Millage, et al., 2021), it is important to document the extent of public subsidies, identify which local governments provide them, and examine the relationship between subsidy availability and quota ownership.

My study also adds to the literature on fisheries and local communities, which has largely emphasized fishing activity. Prior work has shown that fish landings have limited influence on population growth compared to broader demographic and labor market trends (Iversen et al., 2020), and that landing plants act as hubs linking communities to fishing activity (Cojocaru et al., 2019). These findings underscore the complexity of sustaining coastal communities. My study contributes to the understanding of this relationship by examining a complementary dimension: fiscal transfers from local governments and from national investment programs that target rural areas. By mapping the flow of public investment subsidies, my analysis offers an initial perspective on how local governments engage with the fishing industry and suggests a potential channel through which such transfers could influence economic outcomes in communities that rely on catch-share fisheries. Investment subsidies can be especially relevant in this setting as the success of any measure that aims to retain activity will depend on its ability to attract quota investments to the local region, and as Watson et al. (2021) show, local resource ownership can generate local benefits.

The remainder of the paper is organized as follows. Section 2 provides a concise overview of the Norwegian quota system and its key mechanisms, the data used and the policy change that serves as basis for my econometric analysis.[3] Section 3 presents descriptive evidence on the scale and distribution of municipal subsidies to fisheries–related projects, while Section 4 describes correlations with quota ownership in the municipalities. Section 5 details the empirical strategy used to examine the relationship between subsidy eligibility and quota holdings, and Section 6 reports the corresponding results. I conclude in Section 7 by discussing the implications of my findings for fisheries policy and regional development and identify potential alleys for further research.

[3]For a more comprehensive review of the quota system, see Standal and Aarset (2008), Standal and Asche (2018), and Abe et al. (2024), and also the chapter 1 of this thesis.

2 Background and Data

In this section, I first briefly describe the Norwegian fisheries management system and the role of public subsidies in this system. Then I present the data used in the analysis, with emphasis on my procedure for identifying fisheries-related subsidies from municipal business development funds and a state managed investment fund. Lastly, I describe the regional policy reform I use to examine the influence of public subsidies on investments made by fishing firms.

2.1 The Norwegian Fisheries Management System

Today, all major Norwegian fisheries are managed by a catch share system in which a total allowable catch (TAC) is set and semi-transferable catch shares are used to allocate quotas to participating vessels. The TAC system was first introduced in 1977, following the establishment of Norway's 200-nautical-mile economic zone, and initially applied to ocean-going fleets targeting key stocks such as cod and haddock. Non-transferable individual vessel quotas (IVQs) were implemented for the deep-sea fleet and pelagic purse seiners in the late 1970s and extended to the coastal fleet in 1991. By 2006, semi-transferable quotas had been adopted across all major fisheries. The motivation for establishing the system was first to stabilize landings and protect fish stocks, later the focus shifted to efficiency concerns. The legislative interest has throughout the system's lifetime partially been in maintaining coastal communities. This focus contrasts, however, with recent efforts to modernize the fishing fleet. This duality is reflected in the existing quota transfer mechanisms. Initially, they were regarded as tools for reducing excess capacity and improving profitability. However, limits to the transferability of quotas were built into the system to address social concerns: regulators wanted to make sure that quota ownership remained decentralized across regions.

The Norwegian quota management system shares many characteristics with those of Iceland and New Zealand, using total allowable catch and catch shares in an attempt to secure both economic and biological sustainability. A key difference is that in the Norwegian system, quotas are registered to vessels and not fishers. This means that the vessels themselves are a key part of quota transactions, which is important to my study because public subsidies are often granted for purchasing both vessels and quotas.

Vessels within the same regulatory group can exchange quotas under the condition that the vessel giving up its quota is scrapped. This process allows for consolidation of quotas on individual vessels while at the same time driving a reduction in fleet capacity and renewal. Different forms of quota exchange have been available since the late 1990s for selected vessel groups. But it was not until 2004, when the "structural quota system" was introduced for specific vessels in the coastal fleet that there was a rigid system in place. This system would later come to cover all major regulatory groups. The quota system is described as "structural" because of the political aim to alter the structure of the fishing fleet. The structural quota system has several mechanisms that restrict the transferability of quotas. For example, trade must occur within pre-defined regions and there are quota caps limiting the share of quota a vessel can consolidate. The share of structural quotas has increased sharply in the all major fleet segments since the introduction of the system—and the number of vessels has decreased over the same period. Standal and Asche (2018) provide a description of the development of the management system for Norwegian fisheries, while Abe et al. (2024) cover the coastal cod fishery in particular, and document the effect of quota consolidation.

2.2 Fisheries, Subsidies and Local Communities

Norway's quota management system ties catch shares directly to vessel ownership, anchoring quota ownership to individual fishers and their communities. As the fleet is owner-operated, fishing activity and the associated economic activity becomes geographically embedded—and especially so in regions dominated by the coastal fleets. This is important as recent evidence shows that local economic benefits from fisheries are closely linked to local ownership of fishing rights, which determines where earnings are spent and whether spillover effects materialize in the broader economy (Watson et al., 2021). Further, landings plants, which themselves can provide jobs and economic activity in coastal communities, depend on both the total volume of landings, and consistent deliveries from smaller vessel fleets (Cojocaru et al., 2019). Fisheries with strong local ties can therefore be central to regional economic development, giving local governments incentives to support investments that sustain or expand fishing activity, whether through infrastructure (e.g., ports, harbors, processing facilities) or direct support for vessel and quota acquisition.

Generally, local governments provide subsidies to local firms because they internalize the economic and social benefits of retaining activity in their jurisdiction. These benefits include employment, tax revenues, and spillovers to related sectors. Incentives can be particularly strong in coastal communities where alternative sources of growth are limited and resource-based industries underpin the local economy. These areas might place a higher marginal value on new jobs and investment, creating a strong willingness to pay for mobile capital and firms in a setting where jurisdictions compete. Political economy factors reinforce these incentives: job creation and visible investments are politically salient, and industry groups often lobby for targeted support. In small communities dominated by a single industry, lobbying and political pressure to maintain activity can be especially prevalent.

The adoption of market-based mechanisms, such as quota transfers and consolidation mechanisms, can influence incentives for subsidy provision by reshaping the investment environment, potentially affecting both the demand and supply of public subsides. Catch shares have been shown to improve the economic efficiency of fisheries (see e.g, Costello, Lynham, et al., 2010), which increases profitability and thereby raises the marginal return to capital, strengthening incentives for investment in quota and fishing vessels. Further, tradable harvesting rights create opportunities for quota consolidation and associated economies of scale, amplifying these capital requirements. Fishers facing imperfect capital markets may seek public funding as a complement to or a substitute for private capital. Increased transferability of harvesting rights can further increase demand from efficient fishers seeking to acquire quota from less efficient ones exiting the fishery. At the same time, public capital can also bid up quota prices by relaxing liquidity constraints, thereby increasing the marginal cost of consolidation and potentially reinforcing demand for additional subsidies.

2.3 Public Subsidies - Local Government Funds

I document and analyze the flow of public subsidies to fishing firms in Norway using data from two sources: Innovation Norway (IN) and the Norwegian Ministry of Local Government and Regional Development (KMD). The latter is responsible for local government financing and administration and, as part of this responsibility, they keep an overview of grants provided to firms by municipalities and counties. To do this, the Ministry operates a website that local governments use to manage applications for funding. These grants originate from local government funds managed by municipalities and counties. Local governments prioritize how much of their free disposable income they deposit. The funds are earmarked for supporting business development, and since public financial support for private enterprises is subject to various regulations, all applications must be registered by counties and municipalities in the Ministry's database. I have retrieved data from this database on all applications, awarded or not, for the period 2001–2019.

I received data for the periods 2001–2010 and 2011–2019 in two batches. This is because two different systems for reporting were in place during these two periods. The latter batch contains more comprehensive information as the reporting system was more stringent in requiring municipalities and counties to fill out all the fields.[4] The data covers funding from counties, municipalities and other local public organizations, but I focus on applications processed by a municipality.[5] I received separate files for each funding source in each year for the entire period in a semi–structured format, which I clean and compile into a single dataset. The funding application data has not previously been combined into a complete overview, covering all municipalities and spanning almost two decades.

Each row in the combined dataset represents an individual application, totaling over 27,000 across the study period. The data contains, among others, the application registration date, funding municipality, payment status (e.g., paid out, awaiting project start), total project costs, approved grant sum, and paid grant sum, which generally only covers a portion of the investment. Each application row also contains the recipients'

[4] In the later period, both applicants and local authorities used a web-based portal to submit and register applications, with mandatory completion of all fields. Earlier reporting was manual where the municipalities sent reports each year to the ministry, resulting in less complete records.

[5] Some projects are funded by multiple levels of government. In these cases, I include only those applications processed by the municipality and consider solely the portion of the funding provided by the municipality.

name and ID, though IDs are often missing before 2011 due to less stringent database requirements at the time. Additionally, there is a text field for the project description and, from 2011 and onward, a field for the project's industry (NACE) code.

To identify grants related to the fisheries sector, I use the project description, title, NACE codes, firm name and ID, along with other project characteristics, such as budgetary categories. I create a dictionary of fisheries-related keywords that I use to identify relevant grants based on the text fields. I define three broad categories of fisheries projects for my fisheries related keywords: vessels and quota, infrastructure, and a general catch-all category. I categorize each project grant by matching the project description from the grant data with my keyword categories. The first category contains words related to vessel and quota purchases. I combine vessel and quota investments because quota purchases are closely tied to vessel acquisition. Infrastructure covers, among others, funding for processing facilities, harbors, and landing plants. The rest of the fisheries related projects I assign the general category. This category includes projects where the description matches keywords I have defined as being fisheries related and general, and those projects where there is not a match on the project description, but on other project data, such as NACE codes or firm IDs. Examples of projects from the general category are gear investments, recruitment initiatives for fishers and the establishment of fishing firms.

To get as many initial matches as possible, I keep the fisheries keywords that I match on the project description general. Afterwards, I manually identify projects that are mistakenly identified as being fisheries related, and generate another dictionary of keywords to exclude the rows I have manually identified, and others where these keywords appear in the project description.

For the NACE codes, I use codes related both to fishing directly, and for related activities such as fish processing and maritime infrastructure. To identify grants given to relevant firms and persons, I use both IDs and names of registered owners of fishing vessels, retrieved from the Directorate of Fisheries (DoF), and IDs and names for firms with relevant NACE codes in the Norwegian Business Register. I also use NACE codes and firm information to check the validity of my keyword matches that are based on the project descriptions. I remove cases where the NACE codes for the project or the firms are not fishing firms, and the project description clearly is not related to the fisheries sector.

Through this procedure I generate application-level data for fisheries-related projects submitted to business development funds across all Norwegian municipalities between 2001 and 2019. Using the identifier for the municipality processing the application together with application verdict dates, I aggregate the records to the municipality-year level, producing a dataset that captures the annual provision of fisheries-related subsidies by investment category for each municipality.

2.3.1 Innovation Norway

To supplement the data on local government funding, I acquire records of funding applications submitted to Innovation Norway, a public development agency company jointly owned by the state and counties in Norway. Innovation Norway administers a broad portfolio of financial and advisory tools aimed at promoting value creation, innovation, and regional development. Financial support is allocated on a project basis, and firms apply directly to Innovation Norway. Support is provided either as direct grants or as loans. The loans generally offer more advantageous conditions than commercial alternatives, as they are designed to address capital constraints faced by firms with limited access to conventional financing.

I obtain raw administrative records of all approved grant applications from Innovation Norway's digital database for the period 2001–2017. To construct a longitudinal dataset, I compile and harmonize these records by standardizing variable definitions across years, resolving inconsistencies in coding, and correcting data entry errors. The resulting dataset comprises approximately 113,000 applications with a cumulative grant allocation of NOK 111 billion.[6] The final data contains much of the same information the local government funding records—such as project descriptions, NACE codes and recipient identifiers—while containing additional variables for funding categories and markedly fewer missing values across variables and throughout the period.

[6] All monetary values are expressed in 2017 NOK.

To identify and classify grant applications related to the fishing industry, I apply the same methodology used for the data on local government funds. Specifically, I employ the same keyword–based dictionary to screen project descriptions and cross–reference applicants with firms registered under relevant NACE codes and with vessel owners in the data from the Directorate of Fisheries, excluding applications that do not meet these criteria. In addition, I utilize variables on investment types to identify relevant grants and assign categories. This process yields approximately 4,100 fisheries-related projects, representing a cumulative grant allocation of NOK 17 billion.

The primary focus of my analysis is on local government funding to the Norwegian fishing industry. This is because I focus on local government's support for the local fishing industry and the regional competition for investments, jobs and quota ownership. The Innovation Norway data provides a complementary perspective by capturing the extent of public support at the state level. Including this data allows for a broader assessment of the total volume and distribution of fisheries-related subsidies across governance levels.

2.4 Quota Ownership

I link my data on subsidy provision at the state and local government level to rich register data on vessel and quota ownership covering the period 2001 to 2017 from the Directorate of Fisheries.[7] I use two datasets: one linking all vessels participating in Norwegian fisheries to an owner through unique ID's, which also serves to identify fisheries-related projects as described above, and another detailing vessel–level quota holdings across all regulated fisheries, both with associated validity intervals for the connections. I merge the data by vessel identifier to construct a dataset on owner-level quota holdings and accompanying vessel information, with exact date validity throughout the period.

To calculate the total quota holdings of resident owners in each municipality in each year, I use the vessel's call sign, which encodes its home municipality and corresponds to the owners home municipality. I aggregate the quota holdings of all vessels in each municipality and fishery valid at the end of the calendar year.

I complement the data on subsidy provision and quota ownership with municipality data from Statistics Norway (SSB) covering centrality, demographics employment in the fish processing industry, and economic indicators. I add information from the Directorate of Fisheries on the number of active fishers residing and recipient terminals for fish landings in each municipality to this data. The end product is panel of Norwegian municipalities with quota ownership by resident vessel owners for all stocks managed by catch shares, subsidy provision by category at both the state and municipality level, and general municipality characteristics. Quota and state–level subsidy variables are available from 2001-2017, while all other variables extend through 2019.

For the analysis of the effect of the regional policy change, I use the owner–level quota holdings with home municipality before aggregation. I subset observations of owners that at some point during my study period held quota in the northern fishery for coastal cod and record the number of vessel they have, yielding a dataset with yearly observations that include owners that are active fishers. I append the municipality data to the owner data.

2.5 The 2014 Regional Policy change

Since Norway is part of the European Free Trade Agreement, all public funding is subject to EU laws that limit state aid. Most notably, the European Free Trade Agreement (EFTA) prohibits state aid to avoid competition distorting effects between regions. Exceptions are granted, however, allowing governments to provide funding that discriminates based on place under certain limitations.

In 2014, the regional policy area established under the EFTA Surveillance Agency's (ESA) regional aid legislation included 284 Norwegian municipalities. Firms in this area are eligible for investment aid from public authorities. A large share of the funds from the public authorities are administered by Innovation Norway on assignment by the county administration. Additional funds are provided by the Ministry of

[7] The DoF is an executive agency under the Ministry of Trade, Industry and Fisheries responsible for regulating fisheries and aquaculture.

Local Government and Modernisation in Norway. Sometimes, the funds are awarded directly, but they are often transferred to business development funds managed by the county or municipality administration. The municipalities will also supply these funds with their own free disposable income. Under ESA rules, firms in areas not included in the regional policy cannot receive aid that discriminates based on geography from any public authority. Public authorities include the central government, county administrations, municipalities and any subordinate agency.

In July of 2014, the government revised its regional policy area. The revision was planned in reaction to ESA's revision of its guidelines for regional aid, which takes place every seven years. The general rule set by the ESA is that only firms in regions with a population density of less than 12.5 inhabitants per square kilometer can receive regional aid. In 2010, eight of the Norwegian counties, qualified for regional aid according to this rule. 25.51 percent of the Norwegian population lived in this area in 2010. This is also the population limit for the geographical area for regional investment aid in Norway. The ESA guidelines allow for some discretion on the part of the national government in terms of which municipalities are eligible for support.

The 2014 revision meant that the Norwegian government had to change the municipality composition of its geographic policy area due to a slight decrease in the population threshold in the new ESA guidelines. To meet the new limit, the government removed seven municipalities from the policy area and introduced four new ones, reducing the total number of municipalities in the aid area from 284 to 281.[8]

The Norwegian *District Index* (Kommunal- og moderniseringsdepartementet, 2014a) guided the decision on how to change the municipal composition of the policy area . The Index is a composite measure used to rank municipalities by the severity of structural challenges associated with peripheral location. It combines indicators of geographic disadvantage and socio-economic outcomes into a standardized score ranging from 0 to 100.[9] The index is widely applied in regional policy to identify areas with persistent spatial disadvantages.

3 Local Government Funds

In this section, I analyze the flow of local public subsidies going to fisheries–related projects over the period 2001–2019. I show the extent of these subsidies and examine subsidy provision in relation to municipal characteristics such as centrality, fiscal situation and geography to identify which types of municipalities that provide fiscal support.

I analyze the data at multiple levels. To study municipal subsidy–provision, I focus on what I term *fisheries municipalities*, which are municipalities that either (i) have a coastline and active fishers at any point between 2001–2019, or (ii) provided subsidies to fisheries–related projects during the same period. The first definition is intentionally broad—differing from other studies that consider fisheries dependence (e.g., Iversen et al., 2020; Natale et al., 2013)—because the subsidy records reveal that even municipalities with only a marginal connection to the industry occasionally allocate funds to fishing firms or related projects. By adopting an inclusive criterion, I ensure that the sample captures all municipalities that plausibly could have provided subsidies. Under this definition, 321 out of the 493 municipalities that existed during 2001–2019 qualify as fisheries municipalities.

For some descriptive analyses and visualizations, I aggregate municipalities that merged during the study period to align with the post–merger structure. In these cases, all aggregated data correspond to the 2019 municipal boundaries. Over the period 2001–2019, 27 municipalities were consolidated into 13 new

[8]The Norwegian regulation *Forskrift om virkeområdet for distriktsrettet investeringsstøtte og regional transportstøtte* [*Regulation on the scope of district-oriented investment aid and regional transport aid*], which provides a complete overview of municipalities in the regional aid area, is available at `https://lovdata.no/forskrift/2014-06-17-807`. Related EFTA press releases and legal documents can be found at `https://www.eftasurv.int/newsroom/updates/state-aid-authority-greenlights-norwegian-regional-aid-map-2014-2020`.

[9]The 2014 District Index aggregates nine indicators into four domains: geography (40%), demography (30%), labor market (20%), and living conditions (10%). Geography captures centrality, population density, and travel time to Oslo, reflecting access to jobs and services. Demographic and labor market indicators measure long-term development constraints through population growth, age structure, and employment dynamics, while living conditions are proxied by average income.

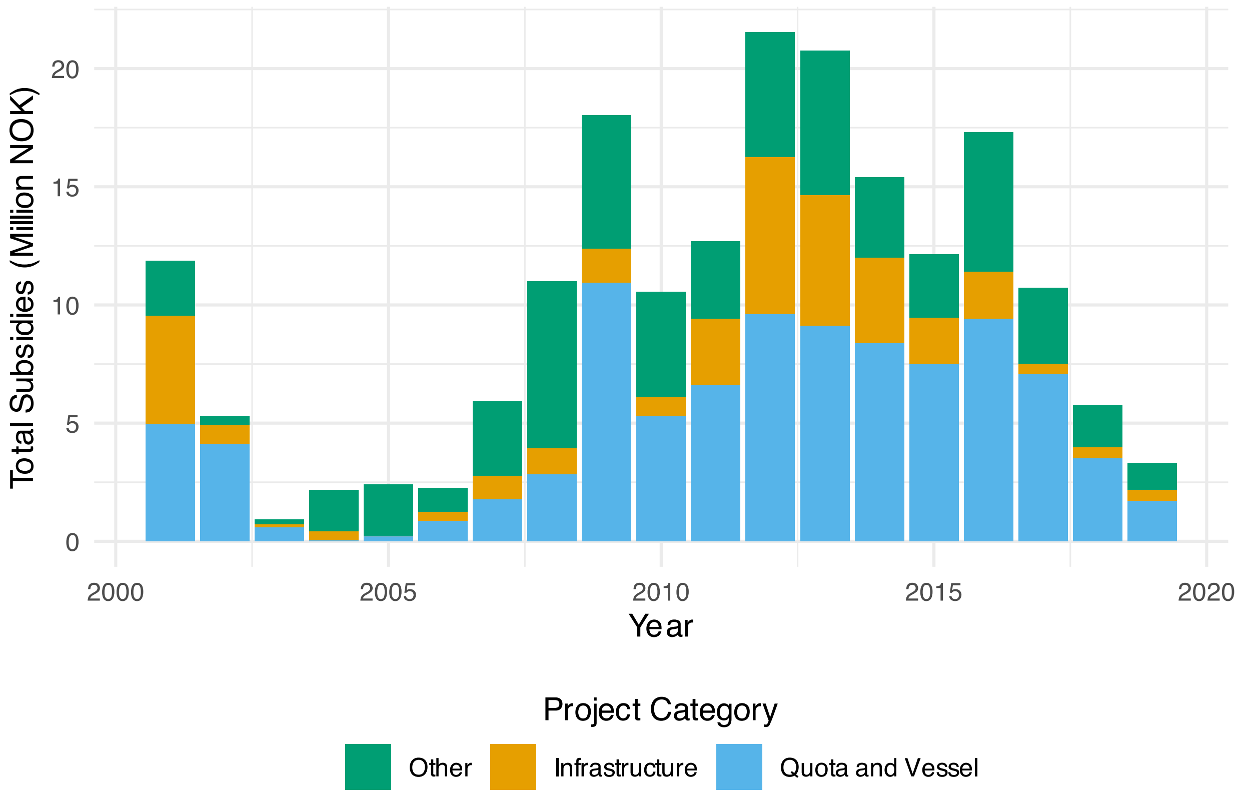

Figure 1: Subsidies From Municipalities to Fisheries-Related Projects by Category, 2001-2019
Note. Data source is the Norwegian Ministry of Local Government and Modernisation (KMD). Author's own calculations.
"Infrastructure" covers subsidies to harbors, processing plants and other fisheries–related facilities. "Quota and Vessel" includes subsidies to either quota or vessels or both.

administrative units; for these, the underlying data are summed across all constituent municipalities to match the merged entity. This approach ensures consistency across years and prevents structural breaks in the panel, for example when mapping the total subsidy provision over the study period. An overview of the mergers is provided in Appendix Table A1.

3.1 Levels of Subsidy Provision

Using the data from the Norwegian Ministry of Local Government and Regional Development, I identify roughly 3000 fisheries related projects subsidized by a municipality over the period 2001-2019. In total, 173 municipalities provided almost 200 million NOK in funding to these projects. Figure 1 shows the development of subsidies over the period by subsidy category. Quota and vessel subsidies represent the largest category in most years, also driving the development in total subsidy amounts over the years. There is a clear dip in the total amount between 2001 and 2007, after which there is a large increase first in subsidies in the general category, and then for quota and vessel subsidies. The latter development could be related to the re-introduction of the structural quota scheme in 2007, which allowed for quota consolidation at the vessel level for several coastal fishing groups. Subsidies to vessel and quota purchases went from 1.8 million NOK in 2007 to 10.9 million NOK in 2009. The total amount subsidies from municipalities to fisheries related projects peaked in 2012, at 22 million NOK, before tapering off towards the end of the study period.

Panel A of Table 1 reports grant–level by category. The distribution is highly right–skewed, with substantial dispersion across all categories—reflecting the variety of projects that receive municipal support. While most subsidy amounts are small, financing minor vessel upgrades or fishing gear, some support large–scale projects such as buying industrial trawlers with quota or harbor constructions. Median grant sizes differ little across categories, but most grants support investments in vessels and quota. About one third of the applications receive only partial funding, which explains the low minimum values in the data. The minimum and maximum values further point to an interesting pattern in subsidy provision: municipalities sometimes award identical amounts to local projects, even when the total project costs differ substantially.[10]

Panel B summarizes municipality–year aggregates of subsidy provision by category, expressed in absolute and per capita terms. At this level, skewness and distribution intensify: standard deviations far exceed means, driven by a few municipalities allocating large sums in specific years while most provide little or nothing. The dominance of the vessel and quota category is even more pronounced, as it consistently ranks highest across all metrics. By contrast, infrastructure subsidies are largely absent in most years, underscoring their sporadic nature. The pronounced dispersion in total subsidies highlights the heterogeneity in municipal support for fisheries–related projects over time.

The variance decomposition for the total yearly subsidy amount, captured by the intraclass correlation coefficient (ICC), show that only 15% of variation occurs between municipalities, with 85% reflecting within–municipality changes across years. The Gini coefficient for total subsidy provision across all years is high (0.64), which together with the ICC, indicate high concentration—but low persistence. Per capita values accentuate this pattern, as some municipalities allocate disproportionately large transfers relative to their population. Taken together, the two panels in Table 1 indicate substantial variation in scale and composition of municipal support.

3.2 State–Level Funding: Innovation Norway

Using the same strategy as for the local government funds, I identify 4,109 project related to the fisheries sector. These received 17 billion NOK in total over the 17 years I study. This amount represents 15 percent of total 111 billion NOK awarded by Innovation Norway throughout the entire period. On average, successful funding applications were granted 4 million NOK, while the median was around 1 million NOK. Innovation Norway thus provides significantly larger amounts to each project compared to the municipal funding, while both distributions are right–skewed. More than 90% of the subsidies went to buying quotas or vessels or both.

Over the period, Innovation Norway funded projects in 199 different municipalities. The difference between municipality-year level aggregates is larger than for the local subsidy provision: 40% of the variation in yearly subsidy levels is between municipalities. However, the majority of the variation remains due to year-to-year variation within municipalities. Concentration across the period 2001–2017 is also high, with a Gini coefficient of 0.71. This implies that projects in the same municipalities tend to receive most of the state funding for the fishing industry over time, but that there is considerable year-to-year variation. Lastly, there is a weak positive monotonic and statistically significant relationship between yearly subsidy amounts at the municipality level from Innovation Norway and from local government funds ($\rho = 0.273, p \leq 0.01$).

Figure 2 shows the development of subsidy provision by funding category from Innovation Norway over the period 2001–2017. A clear majority of the money is provided as loans. The subsidy pattern is similar to that of the local government funding, with little activity between 2001 and 2006, and a large increase in the period following the introduction of the SQS system to the coastal fleet. In contrast to the local funding, however, state funding increases in the years leading up to 2017. The number of projects funded through loans is quite volatile across the period, but generally does not reflect the total subsidy amounts each year.

The number of projects funded by direct grants is small and the amounts fairly stable across the period, between 1 and 15 million NOK. The peak in 2001 is driven by a larger number of approved grants that year and seven projects for purchasing large industrial trawlers. The amount covering vessel scrapping through decommission schemes peaked sharply in 2004 before diminishing quickly in the ensuing years until all schemes had been discontinued in 2009.

[10] This practice is most common among small municipalities and may reflect an effort to ensure equal treatment of applicants, as awards are publicly disclosed and transparency is salient in small communities.

Category	Grants	Min.	Median	Mean	Max.	S.D.
Panel A: Individual Grants						
Quota and Vessel	1,071	1,173	54,991	88,371	2,346,432	137,397
Infrastructure	365	1,173	50,938	94,773	1,900,343	141,393
Other	811	1,199	47,960	75,038	2,346,432	133,679
Panel B: Municipality-Year						
Quota and Vessel		0	30,501	106,703	6,700,236	282,895
		0	(7.9)	(68.0)	(1,331.0)	(147.5)
Infrastructure		0	0	38,999	2,506,056	124,406
		0	0	(23.2)	(1,184.3)	(81.0)
Other		0	14,328	68,609	3,695,630	193,322
		0	(2.4)	(41.7)	(1,722.4)	(120.6)
All		1,947	107,782	214,311	10,425,197	436,449
		(0.1)	(41.0)	(132.9)	(2,071.0)	(236.5)

Table 1: Descriptive Statistics for Subsidies from Municipalities to Fisheries–Related Projects by Category Note. All monetary values are in Norwegian kroner (NOK), deflated to 2017 NOK. The sample period is 2001 to 2019. Infrastructure" covers subsidies to harbors, processing plants and other fisheries–related facilities. "Quota and Vessel" includes subsidies to either quota or vessels or both. Panel A presents statistics for individual grant awards (N = 2247). 662 projects were approved for funding but no money paid out.
Panel B presents municipality–year aggregates (N = 887) , per capita values (in parentheses) calculated using municipality population.

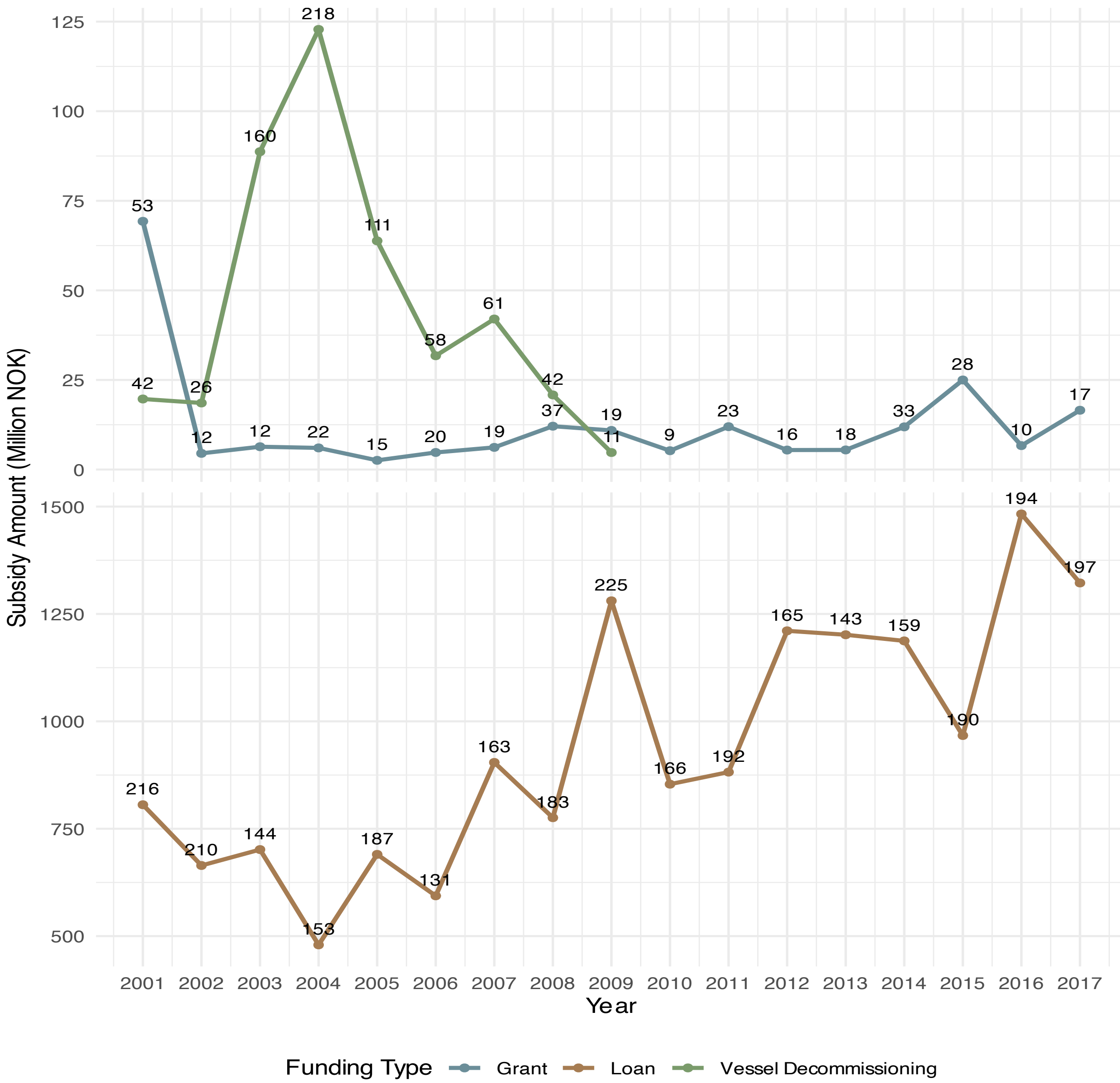

Figure 2: Subsidies From Innovation Norway to Fisheries-Related Projects by Funding Type, 2001-2017
Note. Data source is Innovation Norway. Author's own calculations. Number of funded projects indicated for each year.

Centrality	Pop. Avg.	N	N Subs.	Share (%)	Mean (1000 NOK)	Per Capita
1	30,894	96	17	18	131	56
2	11,884	55	32	58	284	126
3	6,521	50	26	52	339	238
4	3,206	120	79	66	1,208	762

Table 2: Total subsidies (NOK) over the period 2001 to 2019 from coastal municipalities with active fishers to fisheries related projects, by centrality level.
Note. Centrality ranking based on Statistics Norway's classification: 1 = most central municipalities, 4 = least central municipalities. Per capita values calculated using population averages over the period.

3.3 Patterns of Local Subsidy Provision

Municipal business development funds serve as fiscal instruments that municipalities use in an effort to stimulate employment and encourage people to stay in, or move to the region, often in competition with other regions—a common feature of regional policy (see, e.g., Slattery, 2025, who examines how U.S. states compete for firms through subsidies and incentives). The degree to which a municipality chooses to target the local fisheries sector specifically will depend on many factors, such as the importance of the industry for the local economy and the availability of alternative sources of investment funding. As Agrawal et al. (2022) show in their survey, local governments often choose to subsidize specific industries in response to economic dependence, expected spillovers and limited alternatives for stimulating growth, especially when those industries are central to the local tax base and employment structure. The latter dynamic may be especially relevant in rural communities along the coast in Norway if fisheries dominate the local economy—in this case the local government faces strong incentives to support their local fishing industry.

To investigate the relationship between rurality and subsidies to the fishing industry in Norwegian municipalities, I first group the municipalities based on centrality using SSB's centrality classification. This is a measure of a municipality's location in relation to urban settlements and the size of those settlements. I have classified the municipalities into four broad groups based on this standard, ranging from least to most central.[11] To focus on the role of centrality among those municipalities that have plausible incentive to support fisheries-related initiatives, I restrict my sample to include only fisheries municipalities.

Table 2 shows the distribution of total subsidies from fishing municipalities across centrality categories for the period 2001–2019. The group of least central municipalities exhibits both the highest proportion of subsidy provision over my study period and significantly larger allocations, both on average and in per capita terms from 2001 to 2019. This is substantially more than the other centrality groups; only 18 percent of fishing municipalities in the most central group provided any subsidies, with an average per capita amount of NOK 56. This pattern is notable given that all municipalities in the sample are fisheries municipalities, yet many did not allocate any subsidies during the entire study period. This inverse relationship could reflect higher economic reliance on fisheries in the least central areas, prompting local governments to provide the industry with fiscal support. The relationship is most evident in between categories 1 and 4. Municipalities in categories 2 and 3 exhibit similar levels of subsidy provision, with differences becoming more evident when considering per capita levels.

Given the spatial nature of both fisheries activity and rurality, geography likely influences how municipalities engage with the local fishing industry. For example, the existence of strong fishing industry clusters may shape local development strategies and affect the perceived need for public funding. In the case of U.S regions, Porter (2003) finds that regional prosperity is influenced by the strength and productivity of local traded

[11] From 2001 until 2018, SSB used four categories from least to most central based distance to a center hosting higher-order functions, such as banks and post offices. In 2018, they introduced a new standard, based on commuting distances and service functions. In order to compare centrality categories across my entire study period, I assign centrality for observations of municipalities in 2018 and 2019 based on their 2017 category. Since centrality is stable over shorter time periods, this should not influence my analysis.

clusters—including resource dependent ones like fisheries—because wages in these clusters tend to drive broader regional wage levels. This suggests that municipalities could use subsidies to the fishing industry as a way to boost local economic performance. Municipalities in northern Norway are in general both more rural and more dependent on the fishing industry, and also geographically closer to the fishing grounds for many economically important fisheries, such as the coastal fishery for cod. At the same time, there is a large variation among municipalities within regions—in terms of rurality, industry structure, economic capacity, and other local characteristics—which can influence the degree to which municipalities subsidize their local fishing industry. Figure 3 illustrates the interplay between this spatial variation and the distribution of per capita subsidies to fishing-related projects across Norwegian municipalities.[12]

Figure 3 shows substantial spatial variation in support levels across Norwegian municipalities. A number of fisheries municipalities, particularly in Southern Norway, never provided any support during the period. Among municipalities that did fund fisheries–related projects, the per capita subsidy levels tend to increase with latitude, with the highest levels observed in the northernmost regions. This pattern likely reflects the stronger economic dependence on fisheries in these areas. The figure also highlights the strong negative relationship between centrality and subsidy provision documented above: the least central municipalities, many of which are located in the north, exhibit systematically higher support levels. The three municipalities that provided the highest per capita levels of support, labeled in Figure 3, are all within the group of least central municipalities, and located in the north. Along the southern parts of the western coast, however, this relationship appears weaker, suggesting that other local factors might mediate the relationship. Finally, the map reveals some regional clustering of subsidy provision, which could reflect horizontal spillovers, whereby local governments respond to neighboring funding decisions—either through imitation or strategic competition for fisheries-related activity. The pattern could also reflect the existence of regional fishing industry clusters, among other possible mechanisms.

The incentives a local government has for subsidizing the fishing industry vary not only across space, but also over time. Changes in regulatory conditions, municipal finances, and the development of the industry—potentially shaped by earlier subsidies—can all influence local funding decisions. To explore this dynamic, I divide my study period into three sub-periods: 2001-2007, 2008-2014, and 2015-2019. This choice is motivated by the reform of the structural quota system (SQS) for the coastal fleet in 2007, which expanded on the market oriented mechanisms first introduced in 2004 and extended them to a broader segment of the fishing fleet.[13] The shift toward a more market-based management system increased incentives for investment in quota and vessels, likely raising both fishers' demand for municipal subsidies and local governments' incentives to offer them, as a means of attracting resource ownership. Figure 4 illustrates how per capita subsidy levels varied across Norwegian municipalities over the three sub–periods.

The figure reveals significant temporal variation. While the general pattern of high support levels in northern municipalities persists throughout, the 2008–2014 period stands out as the peak in both the intensity and geographic extent of municipal subsidy provision. This is in line with my reasoning above: the shift toward a more market-based fisheries management system likely increased both the demand for, and the willingness to provide, funding. The shift could also explain that from 2008 onward, a growing number of western coastal municipalities begin to allocate subsidies, and those already active in the early period increase their support levels. Across all three sub-periods, a cluster of municipalities in the far north consistently appears among the highest per capita providers of support, possibly reflecting a persistent strong reliance on fisheries and limited economic alternatives. There are also several coastal clusters in other parts of the country—typically composed of the least central municipalities—that consistently provide funding for fisheries-related projects in each sub-period. This spatial-temporal pattern suggests that the positive association between rurality and subsidy provision is stable over time. Moreover, the pattern for 2008-2014 indicates that local subsidy behavior was influenced by an interaction between the institutional changes and geographic characteristics.

[12] Appendix figures A1 and A2 show enlarged views of Northern and Western Norway, respectively.

[13] Although the SQS was formally introduced in 2004, it was paused between 2005 and 2007 following a change in government and an accompanying policy review. Because of this pause, and the subsequent expansion of the system in 2007, I use the latter year as a turning point for the analysis.

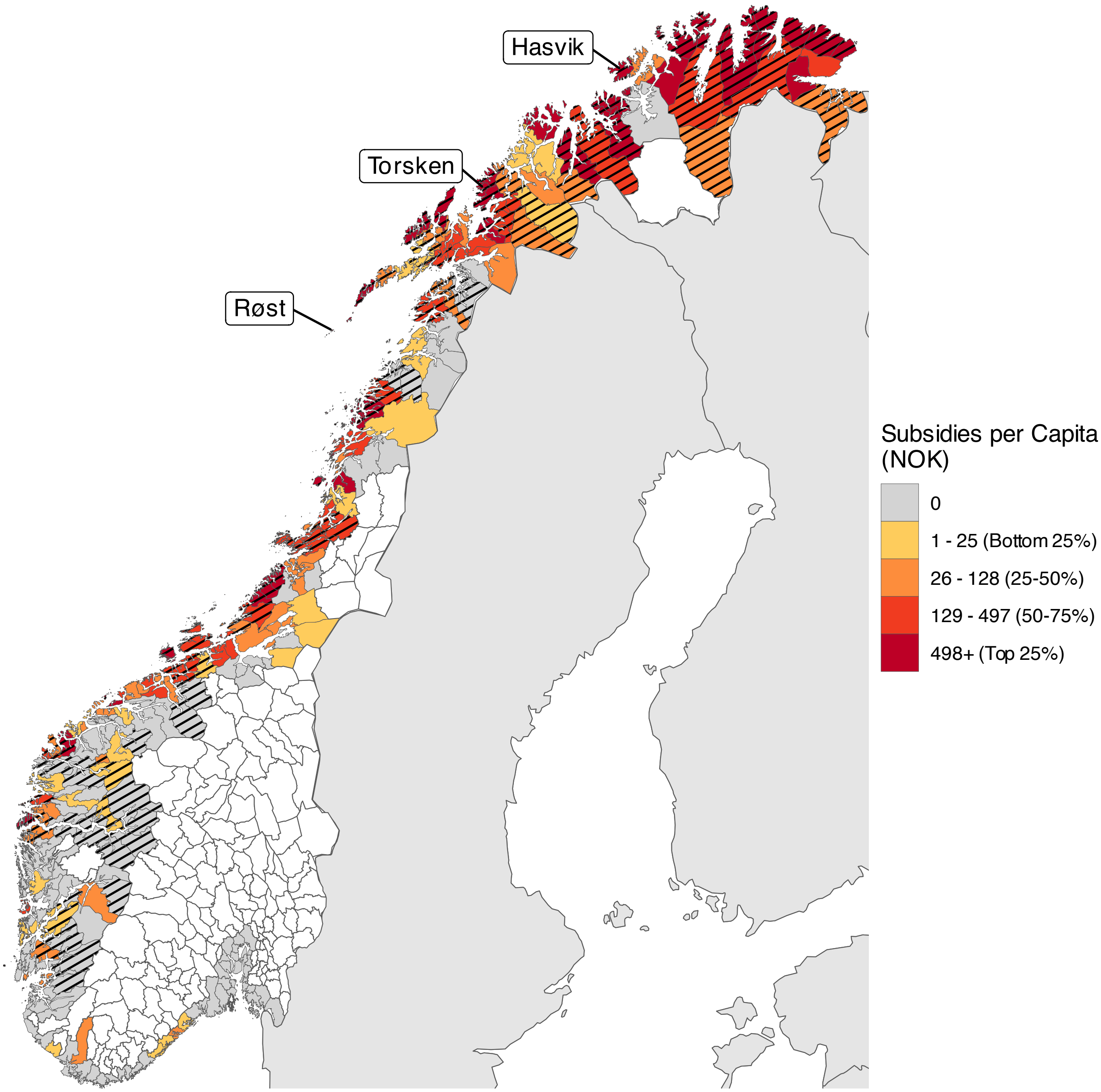

Figure 3: Total Amount of Subsidies Over the Period 2001 to 2019 from Municipalities to Fisheries-Related Projects

Note. All subsidy figures are aggregated according to the 2019 municipal structure. Over the observation period, 27 municipalities were consolidated into 13 new administrative units. For these cases, subsidy amounts have been summed across all years to correspond with the post-merger boundaries.

Least central municipalities are hatched. Non-fishing municipalities have a white fill. These had no active fishers during 2001-2019 and no coastline, or did not provide any grants in the period 2001-2019. Named municipalities are the three with the highest grant sums per capita for the period.

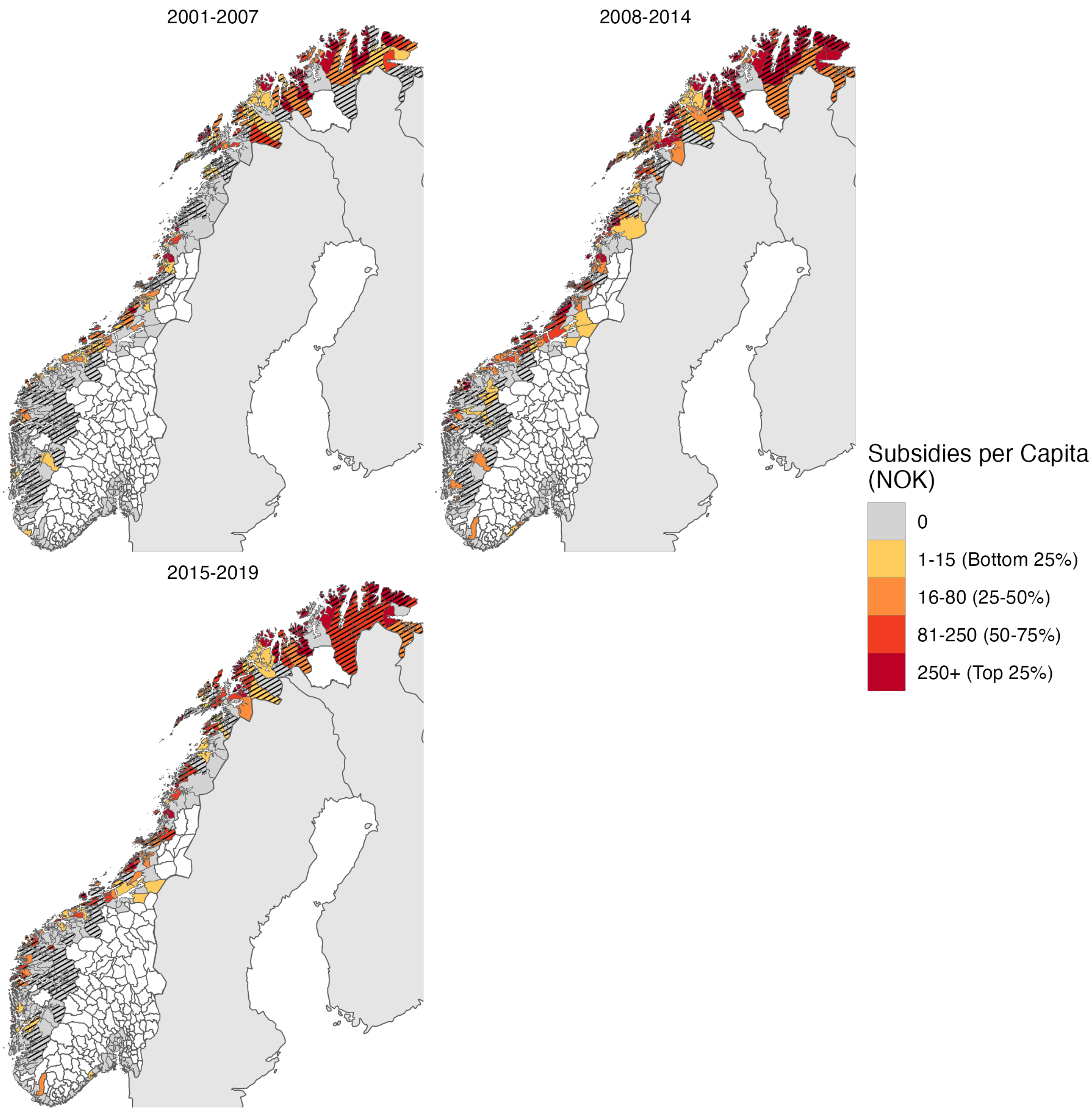

Figure 4: Per Period Subsidies from Municipalities to Fisheries-Related Projects
Note. Subsidy amounts measured at the 2019–municipality structure. Least central municipalities are hatched. Non-fishing municipalities have a white fill. These had no active fishers during 2001-2019 and no coastline, or did not provide any grants in the period 2001-2019. Named municipalities are the three with the highest total grant sums per capita for the period.

3.4 Fiscal Health

Municipal finances can influence both the incentives and ability to subsidize local industries. Financially robust municipalities possess greater budgetary slack, which lowers the marginal cost of public funds, and reduces distortionary burden of raising revenue for discretionary programs. In the context of U.S municipalities and counties competing for mobile firms and capita, Agrawal et al. (2022) argue that fiscal strength enables more aggressive subsidy strategies and review empirical studies that document widespread use of targeted incentives and bidding for firms, particularly among jurisdictions with greater resources.

Conversely, fiscal distress can create incentives for strategic subsidies aimed at attracting employment and rebuilding the local tax base, in line with the discussion above on industry clusters and local government incentives for subsidy provision. Consistent with this, Slattery and Zidar (2020), in their evaluation of state and local business tax incentives in the United States, find that poorer counties tend to offer larger subsidies per job. They attribute this pattern to differences in baseline attractiveness and expected profitability: distressed areas often lack agglomeration advantages and other amenities, so they must offer larger subsidies to compensate for lower anticipated returns and remain competitive in firm-location bidding. Similarly, local governments in regions adversely affected by consolidation in the fisheries sector may fund quota and vessel investments, as well as general infrastructure improvements, to offset declining economic prospects and prevent further erosion of their tax base.

Against this backdrop, I examine whether patterns in per capita levels of subsidy provision correlate with municipalities' fiscal health, as measured by net operating balance (NOB).[14] Over the period, fisheries municipalities typically had a lower NOB compared to the average Norwegian municipality. This could affect their capacity to provide subsidies, which might explain why roughly half of the fisheries municipalities during the period never provided any subsidies to the local fishing industry.

I calculate the correlation between subsidy provision and fiscal health using Spearman's rank correlation coefficient to account for the extreme values and substantial mass of zero observations in the subsidy variable. The results in Table 3 (a) show that the correlation between subsidy provision and fiscal health is weak and not statistically significant. This may reflect the large number of municipalities that provided no subsidies in a given year, which compresses the rank distribution. Therefore, I examine the association between fiscal health and the likelihood of subsidy provision by estimating a logit model where the dependent variable equals one if a municipality provides any subsidy and where I include year fixed effects to account for common shocks. The results are reported in part (b) of Table 3 and show that NOB as a share of operating income does not significantly predict subsidy provision. This suggests that fiscal health does not play a decisive role in whether fisheries municipalities engage in subsidy provision.

The fisheries municipalities that never provided subsidies during the period might be structurally different than those that did, making fiscal health irrelevant. It could be that the local fishing industry is self-sufficient, or that it represents a small share of local economic activity and is therefore not prioritized. The rows labeled "Any Subsidies" in Table 3 (a) show the correlation between subsidy provision and fiscal health for the subsample of fisheries municipalities that at some point during the period provided subsidies. For these municipalities, there appears to be a positive, weak but statistically significant relationship between subsidy provision and fiscal health. The correlation becomes stronger if I consider only observations of positive subsidy provision: among those that do intervene, financially robust municipalities tend to provide more.

However, fiscal health does not predict subsidy provision for the subsample of municipalities that at some point provided subsidies during 2001–2019, as shown by the estimate in the column labeled "Any Subsidies" in Table 3 (b). This indicates that the decision to subsidize is unrelated to short-term fiscal conditions. The columns under "Positive Subsidies" present results from an OLS regression of log–transformed subsidy amounts on NOB for municipalities that provided subsidies. The estimated association is strong and statistically significant when only year fixed effects are included. Including municipality fixed effects, however,

[14] NOB is the surplus from a municipality's ordinary operations, adjusted for net financial transactions and excluding depreciation. Measured as a share of operating income to normalize across municipalities. NOB reflects the municipality's capacity to fund investments or build reserves. Subsidy provision is measured in per capita terms to express the relative financial intensity across municipalities.

Sample	Observations	Spearman's Rho	p-value
Fisheries Municipalities	5248	0.008	0.565
Any Subsidies	2760	0.047	0.014
Positive Subsidies	883	0.128	< 0.01
2001-2019	154	0.207	< 0.01
2001-2007	94	0.319	< 0.01
2008-2015	134	0.172	0.047
2016-2019	106	0.189	0.052

(a) Spearman Correlation Coefficients for Subsidy Provision and NOB. Period rows show the correlation between total subsidy amount over those years and average NOB.

	Probability of Subsidy		Positive Subsidies	
	Fisheries Muni.	Any Subsidies	Year FE	Two-way FE
NOB (%)	0.012	0.017	0.052 ***	-0.003
	(0.009)	(0.012)	(0.013)	(0.008)
N	5248	2760	883	883
R2 Adj.			-0.003	-0.242
logLik	-2376.877	-1552.111		

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

(b) Subsidy provision regressed on NOB. Robust SEs (municipality–clustered) in parentheses. Columns (1–2): logit Pr(Subsidy> 0); columns (3–4): OLS log(Subsidy| > 0). Year FE in all specifications. Municipality–fixed effects included in column (4).

Table 3: Relationship Between Municipal Fiscal Health and Fisheries Subsidy Provision, 2001–2019, Measured Yearly for Municipalities.
Note. Net operating balance (NOB) measured as share of operating result.
"Any subsidies" includes municipalities that at some point during 2001–2019 provided subsidies to fisheries related projects.
"Positive subsidies" includes observations of municipalities in years they provided subsidies.

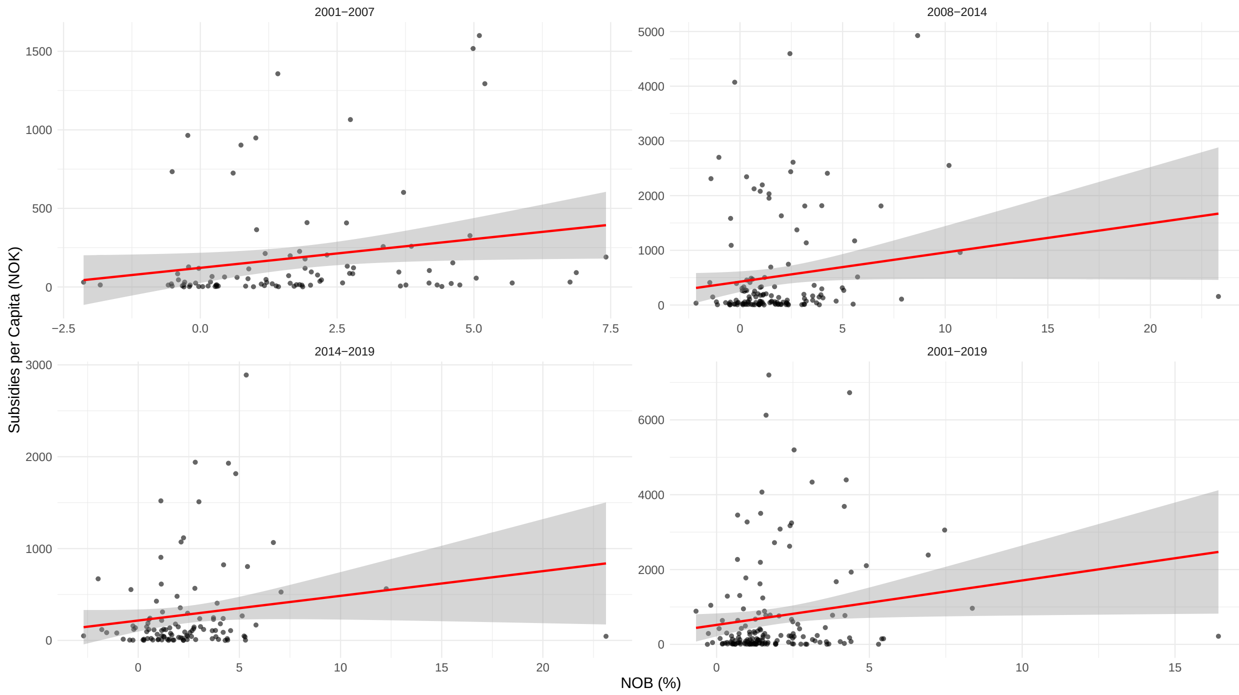

Figure 5: Scatter Plot of Subsidies per Capita and Net Operating Balance for Fishing Municipalities
Note. Sample is restricted to non–zero observations of subsidy amounts aggregated over the period. NOB is averaged.
The red line represents a smoothed linear model fit with subsidies as the dependent variable; shaded areas indicate 95% confidence intervals.

drastically reduces the coefficient and renders it statistically insignificant, indicating that the relationship does not operate through short-term fiscal fluctuations within municipalities. Taken together, the results indicate only weak and uneven patterns: any link between fiscal health and subsidy provision appears heterogeneous across municipalities, showing more variation in cross-sectional differences than in changes over time within municipalities.

To examine the relationship over longer periods, I aggregate subsidy provision and NOB across multi–year periods. This allows for examining the sustained association between fiscal performance and prolonged subsidy provision. Period aggregates may capture systematic behavior more effectively, as municipalities who consistently have strong fiscal performance could allocate more resources to fisheries projects, or conversely, sustained subsidy provision might be correlated with a consistently robust fiscal situation.

The lower part of Table 3, part (a), shows the correlations between total per capita subsidies and average NOB for individual sub–periods and across the entire period. The relationship is more pronounced when aggregated into sub–periods relative to yearly observations. The correlation is strongest for the period 2001–2007, when total subsidies across municipalities were at their lowest levels. Aggregate municipal subsidy provision over all years is moderately correlated with fiscal health. This long–term dynamic could arise as municipalities that over time are in good fiscal health are also able to prioritize fiscal support, or it could indicate that providing subsidies over several years help maintain municipal finances by strengthening the local fishing industry.

Scatter plots of the aggregated results are shown in Figure 5. Mirroring the correlation results, the plot for the period 2001–2007 shows a clearer pattern. In all plots, there is a clear bunching of observations between 0 and 5 percent NOB, and subsidy amounts of less than 1000 NOK per capita. In each period, many municipalities provided very high amounts of subsidies, but they do not appear to be systematically associated with high values of NOB.

4 Subsidies and Quota Ownership

Commercial fisheries are widely assumed to play a central role in local economies, underpinning policy debates on consolidation, the distribution of harvesting rights, and the preservation of coastal communities. Under rights-based management systems, resource extraction is closely linked to resource ownership, potentially making the latter an important determinant for whether extraction generates local economic benefits. Notably, Brown et al. (2019) show that royalty income accruing to local owners of subsurface mineral rights account for the majority of the total local income gain in U.S. counties experiencing oil and gas growth in the period 2010–2014. Their findings highlight that ownership rents, not only labor market outcomes emphasized in earlier research, is an important channel for accruing local benefits from extraction activities.

A similar pattern emerges in the relationship between fisheries permit owners and local economic activity. Watson et al. (2021) demonstrate that in Alaskan fishing communities, location of resource and capital ownership matters more than of fish landings for local economic outcomes: earnings of local permit owners create stronger induced effects than wages paid to non–resident processing workers, which often leak out of the local economy. In sum, these findings suggest that policies influencing ownership structures—such as investment subsidies—can be viable tools for municipalities seeking to stimulate local economic activity.

4.1 Correlation Patterns in a Regression Framework

To examine the association between subsidy provision and quota ownership, I focus on three important fisheries with varying degrees of local connection. First, the coastal cod fishery north of the 62°N latitude line is Norway's most economically and socially important fishery. Participating vessels are typically small and land their catch locally, making it central to coastal communities and, by extension, to municipalities aiming to stimulate local economic activity. The strong consolidation observed in recent years may have further motivated municipalities to support investments in the fishery. Second, I examine the the coastal fishery for Norwegian Spring Spawning Herring (NSSH). While also economically important and prominent in specific regions, the NSSH fishery is less central than the cod fishery as fewer vessels and fishers participate. Accordingly, I expect a weaker association between subsidies and quota shares in the NSSH fishery.

Lastly, as a control, I examine quota ownership for the ocean–going cod trawlers. These vessels operate far offshore, often with onboard processing facilities and crews drawn from across the country, meaning the fishery has limited ties to any specific local community. Moreover, investment requirements in this fleet are substantially higher—both in terms of quota acquisition and vessel capital—such that any municipal contribution would likely constitute a small share of total financing, limiting both the potential influence of public support, and the incentive to allocate scarce public funds to this fleet. Lastly, the fleet is generally more profitable as the production units are larger, which likely makes it easier for the firms to raise funding from traditional sources. Descriptive statistics for annual quota share data, aggregated to the 2019 municipal structure and reported by sample for each fishery, are shown in Table 4.

For each fishery, I model quota ownership as the share of the total quota held by resident fishers in a municipality in a given year. I focus on total per capita subsidy provision to capture the aggregate influence of fiscal support, possibly capturing some spillover effects of infrastructure improvements in addition to the direct influence of subsidies to vessels and quota. I use per capita values as they reflect the fiscal support relative to the local population, and therefore the municipality's prioritization of fisheries.

I regress quota shares in each fishery on subsidy provision in a given year. I model the relationship as contemporaneous to explore simple correlations in a regression framework where I can account for the panel structure of my data, but without making claims about the dynamics or causal nature of the relationship. The model results will indicate typical levels of quota shares associated with different subsidy levels, leaving open the question of directionality and causality. To explore how structural factors affect the correlations, I run both pooled OLS (POLS) and fixed effects (FE) models. The former captures variation both the across and within municipalities over the entire period, whereas the FE model accounts for unobserved municipality-specific factors affecting the relationship and captures within-municipality variation. I include a squared term on per capita subsidies to capture potential nonlinearities.

The analysis is conducted on the full sample of Norwegian municipalities over the period 2001–2017. Rather

	Cod		NSSH		Cod Trawl	
	All	Fisheries	All	Fisheries	All	Fisheries
Min.	0	0	0	0	0	0
P25	0	0	0	0	0	0
Median	0	0.0165	0	0	0	0
P75	0.0644	0.259	0	0.212	0	0
Max	9.59	9.59	8.96	8.96	17.3	17.3
Mean	0.237	0.368	0.237	0.368	0.237	0.368
SD	0.734	0.888	0.745	0.902	1.28	1.57
ICC	0.928	0.924	0.8	0.789	0.843	0.84
Obs.	7174	4624	6752	4352	7174	4624
Shr. Zero Obs.	0.658	0.47	0.756	0.622	0.949	0.921
Muni.	422	272	422	272	422	272
Years	17	17	16	16	17	17

Table 4: Summary Statistics for Annual Municipality–Level Quota Share Ownership
Note. Data covers the period 2001-2017. Aggregated at the 2019 municipality structure. For NSSH, 2001 is left out as the fishery was open that year. "All" includes all Norwegian municipalities. "Fisheries" is a subsample of municipalities that have a coastline with active fishers, or provided subsidies to fisheries–related projects.
ICC is the intraclass correlation coefficient for quota shares in municipalities.

than restricting the sample to municipalities with quota shares, I condition on a fisheries municipality indicator in the pooled OLS specification. This approach avoids conditioning on the outcome variable and ensures comparability across municipalities. Including non-fisheries municipalities introduces many zero observations, but these likely reflect real structural differences and help identify the association between quota ownership and subsidy provision.[15] Using the full sample also allows me to examine whether the fishing municipality indicator is associated with quota share ownership, by including it as a control in the pooled OLS model.[16]. In this way, I can condition the analysis on long-run fisheries engagement, and partial out the component of the subsidy-quota relationship that reflects general fisheries dependence. The estimation results are reported in Table 5.

4.2 Regression Results

The pooled OLS model for the coastal cod fishery reveals a strong positive correlation between subsidy provision and quota shares. Municipalities that allocate more subsidies per capita tend to be those where resident fishers hold a larger share of the total quota. The squared term is negative, suggesting that the magnitude of the association is reduced at higher levels of subsidy provision. Specifically, the linear and quadratic coefficients on subsidy provision in column two shows that a one-standard-deviation increase in per capita subsidies (91 NOK), evaluated at the sample mean per capita subsidy level (15 NOK), is associated with a 0.24 percentage point higher quota share. This magnitude is approximately equal to the quota share sample mean and corresponds to about one-third of a standard deviation.

A similar concave pattern is observed for the NSSH fishery, though the coefficient magnitudes are slightly reduced, as anticipated. The indicator for fisheries municipality is positive and statistically significant in both fisheries. This likely reflects long-run structural differences in fisheries dependence across municipalities: including the indicator effectively nets out the many zero observations from municipalities with no fishery activity, reinforcing that the observed correlation is not merely an artifact of structural dependence. The pooled OLS results thus reveal a positive association between per capita subsidies and quota shares in the coastal fisheries, with the correlation persisting even within fisheries municipalities. The direction of influence is not identified in this specification: while the model treats subsidies as the explanatory variable, the observed relationship could equally reflect a pattern where quota ownership drives subsidy allocation, or other underlying structural factors that jointly influence both subsidy levels and quota holdings.

While the fisheries municipality indicator accounts for broad structural differences, the FE approach effectively limits the analysis to municipalities with quota share variation, providing a clearer view of how subsidies and quota shares co-move within communities engaged in the respective fishery. Controlling for municipality fixed effects reverses the relationship from the POLS model: I find a negative and significant correlation for both coastal fisheries. Positive deviations from a municipality's average subsidy level are associated with negative deviations from its average quota share. The coefficient estimates in column "Cod FE" imply that an increase in the within-unit standard deviation (75 NOK), measured across municipalities, is associated with a -0.03 percentage point lower quota share in the coastal cod fishery. This suggests that, within municipalities over time, increases in subsidy provision tend to coincide with periods of relatively lower quota ownership. One potential interpretation—among many—is that municipalities may respond to declining quota shares by increasing subsidies, possibly as a policy effort to support the local fishing industry. Note that while subsidies are modeled as the explanatory variable, the regressions are contemporaneous and intended to capture co-movement, which motivates interpreting the association in both directions.[17]

[15] Robustness checks using a subsample of municipalities with quota shares yield similar qualitative patterns, though coefficients are attenuated. This attenuation indicates that the positive correlation observed in the full sample is partly driven by structural differences in fisheries dependence across municipalities: areas with stronger fisheries presence both allocate more subsidies and hold larger quota shares. Removing municipalities without quota shares reduces this structural variation, weakening the pooled estimates.

[16] Recall that the indicator is partially constructed from subsidy history. However, variance inflation factor (VIF) values are well below conventional thresholds, which then suggests that multicollinearity is not a concern.

[17] To support this claim, I also estimate pooled-OLS and FE models for cod shares with subsidies as the dependent variable; signs are consistent, but the FE estimates are not statistically significant as their standard errors are inflated, likely due to limited within-municipality variation in cod quota shares, with only 8% of the total variation occurring within municipalities over time, as shown in Table 4.

	Cod		NSS Herring		Cod Trawl	
	POLS	FE	POLS	FE	POLS	FE
Subsidies pc	2.690 ***	-0.337 **	1.240 *	-0.323 *	0.506	-0.461
	(0.530)	(0.127)	(0.520)	(0.141)	(1.231)	(0.337)
Subsidies pc^2	-1.241 **	0.218 **	-0.682 *	0.210 *	-0.017	0.364
	(0.418)	(0.078)	(0.326)	(0.084)	(0.975)	(0.264)
Fisheries Muni.	0.320 ***		0.347 ***		0.356 ***	
	(0.050)		(0.047)		(0.087)	
N	7174	7174	6752	6752	7174	7174
FE N		422		422		422
Adj. R^2	0.096	-0.058	0.062	-0.063	0.020	-0.061

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 5: Estimation Results: Quota Shares (0-100) and Subsidies per capita (1000 NOK)
Note. Standard errors clustered at the municipality level (in parentheses). Within R^2 reported for FE models. Subsidies per capita are expressed in constant 2017 values (deflated using the CPI). The data on cod quota shares for both coastal vessels and trawlers cover 2001–2017; the NSSH data covers 2002–2017 as the fishery was open in 2001.

The FE results point to a different mechanism than the POLS model. Whereas the pooled estimates reflect structural differences across municipalities in fisheries dependency—where higher quota shares tend to coincide with greater subsidy activity—the fixed effects model isolates variation within municipalities over time, netting out persistent effects such as baseline fishery dependence. The results thus imply that the positive relationship from the pooled model is driven by cross-sectional differences. Once these are removed, the pattern changes: for both fisheries, higher subsidies are associated with periods of relatively lower quota shares. This suggests that the relationship observed in the pooled model reflects structural dependence, while the FE results could highlight a compensatory dynamic within municipalities.

Lastly, the results for the model with cod trawler quota shares shows a positive but not statistically significant association between subsidies and quota shares. Relative to the other fisheries, the estimated coefficient is markedly reduced, and standard error inflated, suggesting both a weaker and less precisely estimated relationship. The lack of relationship between quota ownership in the cod trawler fishery and subsidies could reflect the nature of the fishery: its limited local presence and high capital requirements make municipal fiscal support less likely. Further, any positive association between quota shares and subsidies that reflect general fisheries dependence is captured by the fisheries municipality dummy. The positive association with quota shares, and lack of association for per capita subsidies, in the cod trawler model point to how the dummy captures a different aspect of connection to the fishing industry than fisheries subsidy. The dummy captures a broad dimension of industry presence—excluding municipalities entirely disconnected from fisheries—whereas subsidy provision reflects local active engagement. Consequently, the dummy retains explanatory power even for cod trawlers, which have weak local ties, while subsidies are significant only for fisheries with a stronger local presence. Finally, although subsidies are also negatively associated with quota shares for the cod trawlers in the FE model; there is no evidence of a systematic relationship.

4.3 Changes in Quota Ownership

The preceding analysis abstracts from potential dynamics between subsidy provision and quota shares. In principle, investment support could function as part of a long–term strategy to strengthen the fishing industry and promote local resource ownership. While the immediate effect may be that subsidized fishers acquire additional quota, there could also be processes that work over longer periods, for example through the creation of industry clusters and agglomeration dynamics—channels emphasized in the literature on

	Change Direction	
	Decline	Growth
Min.	-2.09	0.005
Mean	-0.23	0.48
Median	-0.08	0.15
Max.	0.00	6.16
SD	0.34	1.00
Mean QS 2001	0.53	0.57
Median QS 2001	0.12	0.12
Mean QS 2017	0.29	1.05
Median QS 2017	0.03	0.36
QS 2001 Total	65.7	34.3
Total Change	-29.0	29.0
Muni.	125	60

Table 6: Change in Share of Total Quota (Percentage Points) in the Coastal Cod Fishery Owned by Resident Fishers in Norwegian Municipalities between 2001 and 2017, Grouped by Change Direction.
Note. 23 municipalities that had zero growth over the period are included in the "Decline" group. All of these had zero quota shares in 2001 and in 2017. Sample includes municipalities that had quota shares in the coastal cod fishery in at least one year between 2001 and 2017. Annual data aggregated at 2019–municipality structure

place-based policies, which often emphasizes delayed and cumulative effects (see e.g., Becker et al., 2010; Kline and Moretti, 2014). Assessing whether such processes occur in this, however, is beyond the scope of the present study.

Instead, I focus on characterizing the long–term association between public transfers and resource ownership, using changes in quota holdings in the coastal cod fishery between 2001 and 2017. Summary statistics, grouped by change direction, are reported in Table 6. At the outset, municipalities in both groups had on average similar shares of the total quota, although the group that later experienced growth only accounted for about a third of the total. Over time, quota accumulation was more volatile and uneven than quota loss, and distribution remained skewed over time. However, skewness increased markedly for municipalities that lost quota, while it declined somewhat for the growth group, suggesting that reallocation was not concentrated among municipalities with the largest initial endowments. At the end of the period, 44 of the municipalities that experienced decline had exited the fishery completely. Overall, quota reallocation in this fishery was asymmetric in magnitude and dispersion, and growth was concentrated among a relatively small number of municipalities—consistent with the broader trend of geographic consolidation documented in (Abe et al., 2024):

Next I consider the relationship between change in quota shares and the sum of subsidy provision over the period 2001-2017. Figure 6 shows the distribution subsidies, grouped by change direction and distinguishing between total fisheries-related support and subsidies for vessel and quota investments. For total subsidies, most municipalities in both the growth and decline group allocated less than 1.5 MNOK, and many—

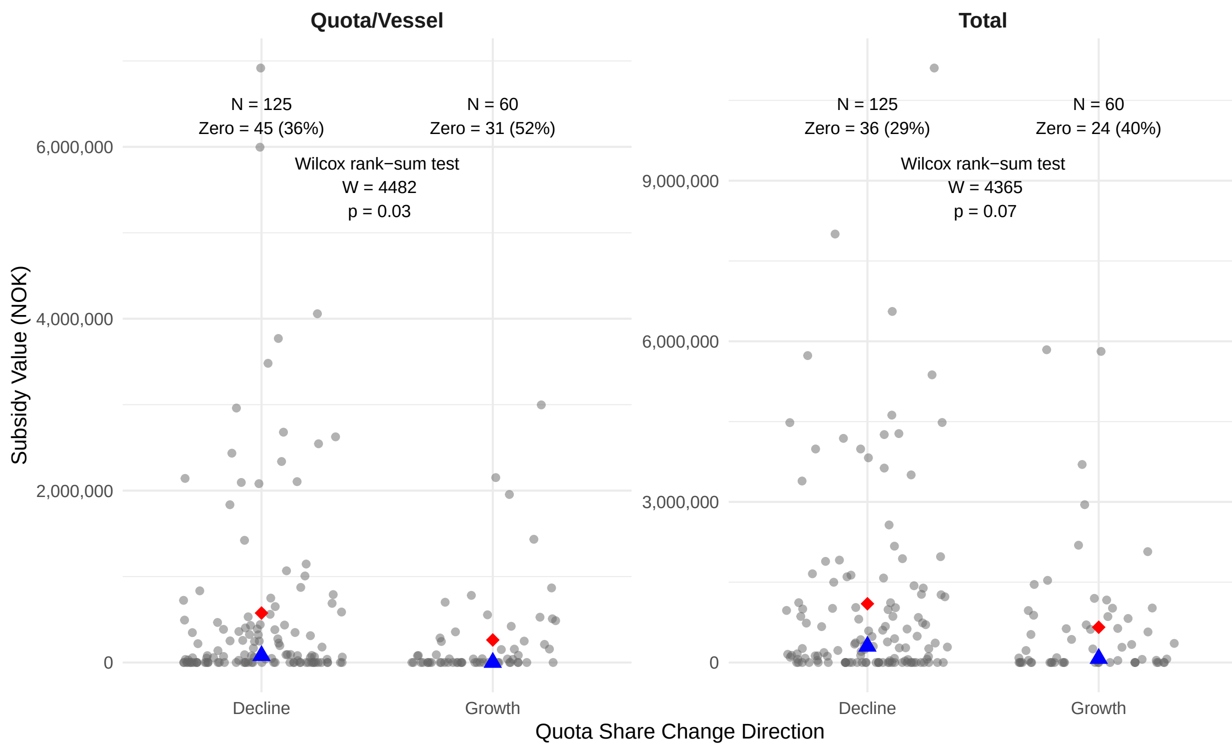

Figure 6: Change in Quota Shares in the Coastal Cod Fishery and Subsidy Provision, Grouped by Growth Direction and Faceted by Subsidy Type.
Note. Quota Share Change between 2001 and 2017 for municipalities that had quota shares in the coastal cod fishery in at least one year during the period. The "Decline" group includes 23 municipalities with zero growth. Red and blue symbols indicate mean and median, respectively.
Wilcoxon rank-sum test statistics and p-values are reported. The null hypothesis states that the two groups have identical distributions.

especially in the growth group—never allocated any. However, a small subset of those experiencing quota decline provided subsidies exceeding 3 MNOK, and up to 11 MNOK in total subsidies. These outliers account for the slightly higher average in the decline group, although the rank–sum test, robust to extreme values, indicates that there is no statistically significant difference in subsidy provision between the groups. The pattern is sharper for vessel and quota investments, where nearly half of growth municipalities gave nothing and high-subsidy outliers are concentrated among those in decline, reflected in the gap between means and medians and supported by the rank-sum test. Correlations confirm the broader relationship: subsidy provision—whether total or targeted—is negatively associated with quota share change ($\rho = -0.337, p = 0.000$; $\rho = -0.368, p = 0.000$). Taken together, these results suggest that municipal fiscal support is correlated with lower or negative growth in quota holdings. This could simply reflect structural factors driving quota redistribution that outweigh any potential effect of subsidies. It could also be that for those who experienced decline or slow growth, the development would have been even more pronounced without local fiscal support. Notably, the negative association is stronger for subsidies targeted at vessels and quota purchases, suggesting that the most intensive efforts to promote resource ownership could be occurring in regions that are the most adversely affected by the consolidation process.

5 Empirical Approach: A Case Study of Regional Aid Eligibility and Quota Ownership

As an extension of my descriptive analysis, I examine how the availability of public funding in a municipality relates to quota holdings. To do this, I make use of the change in Norway's regional policy area that limited firms' access to public aid in some municipalities. Six of the seven municipalities that became ineligible for public investment support, were to varying degrees involved in the fisheries industry.[18] The policy change gives rise to a difference-in-differences (DD) setup where I compare quota holdings in municipalities that lost eligibility for public investment funding with similar municipalities that remained in the regional policy area. Eligibility status was determined entirely at the municipality level and is exogenous with respect to individual quota owners, as there was no targeting based on firm or owner characteristics. This supports identification and allows me to examine how general access to public investment funding affects quota ownership in a region by comparing treated municipalities with similar ones that did not lose access to funding as a result of the policy change. Because the policy change affected only a handful of municipalities—and, by extension, a small number of fishing firms—the results should be interpreted as indicative patterns from a case study.

Eligibility for regional investment aid serves as a broad treatment indicator, capturing the overall access to public funding in the municipality, rather than the subsidies specifically for fisheries-related projects I study in the previous section. This distinction matters because losing eligibility may reduce general investment activity in the local region, indirectly influencing quota ownership beyond targeted subsidies to the fisheries sector.

For the analysis, I focus on quota ownership in the northern coastal cod fishery. This fishery is particularly relevant when assessing how funding eligibility affects quota acquisition as it is Norway's most economically and socially significant fishery. Although harvest occurs along the northern coast, where most quota owners also reside, ownership is spread along the coastline—including most of the western municipalities affected by the 2014 eligibility change. Moreover, the coastal cod fishery has experienced pronounced consolidation in terms of quota ownership under the structural quota system which, through the implementation of market-based regulatory mechanisms, promoted trading activity in cod quota. In sum, these characteristics make the fishery a relevant application for examining how losing access to public investment subsidies influences local quota ownership.

Treatment is assigned at the municipality level, while I measure outcomes at the owner level. Specifically, I use observations of quota holdings for firms and individuals, hereafter referred to as *owners*. Treated owners are those whose home municipality lost eligibility for regional investment aid in 2014. This design is inherently clustered: treatment varies across municipalities, whereas multiple owners are observed within each cluster. Using owner-level data allows for richer modeling of owner characteristics and improves precision relative to an aggregated design; the number of independent treatment units remains unchanged.

I use metric tons (tonnes) of quota for the coastal cod fishery registered to an owner at the end of a year as the unit of observation. This stock measure reflects cumulative holdings rather than transaction flows. Focusing on levels rather than flows is appropriate in my case for two reasons. First, changes in access to public subsidies can influence not only new acquisitions but also the ability of owners to retain existing holdings. Second, the policy change alters the broader fiscal environment in treated municipalities: reduced availability of investment aid may constrain liquidity and redirect capital toward alternative projects, thereby affecting both investment and disinvestment decisions. Levels thus provide a more informative measure of local resource ownership under changing public subsidy conditions.

I construct the control group using one-to-one nearest-neighbor propensity score matching among municipalities that remained eligible for regional aid and had resident owners in the coastal cod fishery during the pre-treatment period. Propensity scores are estimated from pre-treatment averages of quota holdings, owners, population, income, unemployment, share of fishers and employment in fish processing. To account for spatially correlated unobservables, I match municipalities with neighbors within the same county. This

[18] The municipalities were Austevoll, Herøy, Aukra, Kristiansund, Vindafjord, and Finnøy, all located on Norway's western coast. Flesberg municipality in Buskerud also lost eligibility, but it is inland and has no active fisher or quota owner residents and therefore not included in my analysis.

ensures that score estimation and match selection reflect spatial proximity, reducing bias from unobserved regional factors and increasing the likelihood that they are exposed to similar shocks. Summary statistics on covariate balance before and after matching are reported in Appendix Table A2. The aim of the matching process is to align pre-policy trends in relevant variables across treated and control municipalities so that post-policy differences can be attributed to the change in aid eligibility.

Figure 7 shows a geographical overview of the municipalities that lost funding eligibility in 2014 and the control group. The main panel focuses on the west coast region, identifying the six treated municipalities that transitioned out of the regional aid area in 2014 and four neighboring control municipalities that retained eligibility. Two of the municipalities in the region—shown as a separate group in the map—never had any resident owners with coastal cod quota in the period 2009–2017, and are excluded from the analysis. Shaded areas in the inset map delineate the entire regional aid area for the 2014–2020 period. The area covers largely peripheral, rural municipalities with low population density, the majority of all Norwegian municipalities.

To examine the effect of the 2014 revision of the Regional Investment Aid area on quota holdings, I define my DD model in its simplest form as:

$$CQ_{imt} = \alpha + \gamma RIA_m + \lambda Post_t + \delta(RIA_m \cdot Post_t) + \epsilon_{imt} \tag{1}$$

where CQ_{imt} denotes quota holdings (in tonnes) for owner i in municipality m and year t. RIA_m is an indicator equal to one for owners residing in municipalities that lost eligibility, while $Post_t$ is a post-treatment indicator equal one in 2015 and later.

Since regulation took effect in mid-2014, including 2014 in the pre-period introduces partial exposure, which can attenuate the DID estimate as the pre-period mean will reflect some treatment exposure. I test robustness by excluding 2014 and coding it as treated in alternative specifications.

The interaction term $RIA_m \times Post_t$ represents observations of treated after the policy change; the corresponding coefficient δ measures the Average Treatment Effect on the Treated (ATT)—that is, change in quota holdings for owners in municipalities that lost eligibility relative to the change for those that remained eligible. The estimate should be interpreted as the overall effect of losing access to regional investment aid, encompassing all channels through which the policy change may operate. These include direct constraints on financing opportunities, shifts in the broader economic climate, and reduced activity in the local fisheries sector.

I estimate Equation 1 using Ordinary Least Squares (OLS) and observations from the period 2009–2017 to capture trends around the policy change while limiting the length of my pre-treatment period compared all the available years in the quota data. The estimation window is restricted to this period to balance two considerations. First, including multiple pre-treatment years improves the credibility of the parallel trends assumption by allowing visual and statistical checks. Second, limiting the panel length mitigates concerns about serial correlation, which become more severe as the number of periods increases (Bertrand et al., 2004). Also, the sample spans more pre-treatment years (2009–2013) than post-treatment years (2015–2017) due to data availability. This implies that the ATT is weighted toward the pre-treatment period and may understate the long-run impact if the policy effect evolves gradually.

Even with a restricted window, serial correlation remains a concern because quota holdings are persistent over time. This means that residuals are likely correlated with municipalities over time, which can lead to understated standard errors and inflated significance. To address this, I implement two robustness checks. I first collapse the data into pre- and post-treatment periods and re-estimate the model on progressively wider windows around the policy change. This approach reduce the influence of serial correlation and allows me to examine whether the main results are sensitive to sample composition. Second, I cluster standard errors at the municipality level to account for within-cluster dependence. However, with only eight clusters, conventional cluster–robust standard errors remain downward biased, and inference is fragile.

To assess the sensitivity of inference to the small number of treated clusters, I complement conventional cluster-robust estimates with confidence intervals and p-values obtained via the Wild Cluster Bootstrap

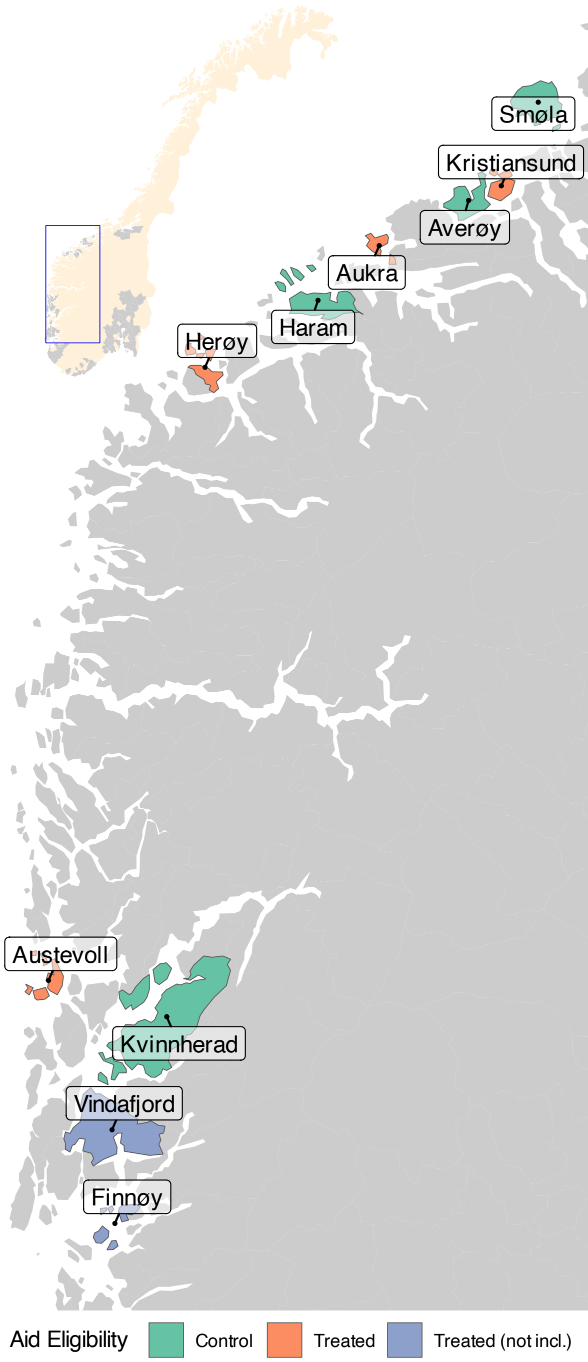

Figure 7: Municipalities Affected by the 2014 Revision of the Regional Aid Area in Norway (Treated) and Selected Controls
Note. Treated municipalities lost eligibility for investment aid for commercial activities under the revised Regional Investment Aid guidelines implemented in 2014. Control units retained eligibility and were drawn from the same coastal region based on pre-reform trends in quota holdings for the coastal cod fishery and relevant observable characteristics on demographics, employment and income. Two treated municipalities are excluded because they had zero quota holdings in all years between 2009 and 2017.
The inset map shows all Norwegian municipalities, with shaded areas indicating regions eligible for regional aid.

(WCB) procedure, first proposed by Cameron et al. (2008). This approach mitigates reliance on large-sample approximations that underlie standard clustering methods. I follow the computational implementation described by Roodman, Nielsen, et al. (2019).[19] This implementation preserves heteroskedasticity and intracluster correlation by multiplying residuals within clusters by random weights. I use Webb's six–point distribution for wild weights, as recommended in settings with few clusters (Webb, 2023).

Yet, it is difficult to completely remove the problem through bootstrap correction: MacKinnon and Webb (2017) show that WCB can perform poorly when the total number of clusters is small, even if treatment is well distributed, while MacKinnon and Webb (2018) demonstrate that inference becomes even more fragile when the number of treated clusters is very small. Both issues apply in my case as I have few clusters overall and only four treated clusters, meaning that inference remains fragile under bootstrap correction, and results should be interpreted with caution.

To explore the sensitivity of the bootstrap results, I calculate p-values from both the restricted (WCR) and unrestricted (WCU) variants of the bootstrap. In WCR, the bootstrap data-generating process imposes the null hypothesis—that the treatment effect equals zero—by re-estimating the model under this restriction before generating bootstrap samples. This makes WCR generally more conservative. By contrast, WCU does not impose the null and uses the original estimates, often yielding smaller p-values. Simulation evidence shows that WCR can severely underreject when the number of treated clusters is very small, while WCU tends to overreject in the same setting (MacKinnon and Webb, 2018). In this setting, the divergence between the two provides a useful diagnostic of sensitivity.

A potential concern for identification is that change in eligibility correlates with prior changes in quota holdings, violating the parallel trends assumption and biasing the DD estimate. Since the eligibility decision was not explicitly related to the fishing industry, and the coastal cod fishery is marginal in terms of quota ownership in all areas that lost eligibility, it is unlikely that low catch-share holdings influenced the government's decision directly. A more plausible channel is through omitted variables: although matching improves baseline comparability, it does not eliminate the risk that municipalities experiencing population growth, improving labor markets, or rising income—factors that reduce their district index score and increase the likelihood of removal from the aid area—also attract quota investments or in-migration of fishers.[20] If so, the estimated treatment effect would be attenuated and my estimates would understate the true negative impact of losing access to regional aid. To mitigate this potential bias, I augment my DD model in Equation 1 with time-varying controls for income, unemployment, net migration, fishers, landing plants for fish and employment at fish processing plants.[21] I include the sectoral controls to capture industry-specific trends that could influence quota investment independently of regional aid eligibility.

[19]Specifically, I use the *fwildbootstrap* function in R (Roodman and Fischer, 2021)

[20]The Government press statements explicitly cite employment, population, and economic growth as key factors in the revision (Kommunal-og moderniseringsdepartementet, 2014b)

[21]Migration and unemployment is measured as share of municipality population, fishers and employment at fish processing plants is measured as shares of labor force. Since the controls vary over time and may themselves respond to the loss of aid eligibility, inclusion risks post-treatment bias. However, the values are stable over the short post-treatment period of three years, and the bias is therefore negligible. Landing plants are measured relative to number of vessels registered in the municipality. For this variable, the response to the policy change is likely stronger as quotas are registered to vessels. Therefore I use average vessel number for each municipality in the pre-treatment period to avoid post-treatment bias.

6 Results: Regional Aid Eligibility and Quota Ownership

In this section I present results from the analysis of the 2014 change in the regional aid area in Norway on quota holdings. First, I examine pre-treatment trends to assess comparability between treated and control municipalities. Second, I report event-study estimates that illustrate dynamic patterns around the policy change. Finally, I present difference-in-differences estimates and discuss robustness checks, including bootstrap inference and collapsed-period specifications.

6.1 Pre-treatment Trends

Table 7 reports summary statistics for yearly observations of key characteristics of treatment and control municipalities in the pre- and post-policy periods. Baseline quota holdings are comparable across groups in the pre-treatment period, though treated municipalities exhibit substantial within-group variation.[22] This is an indication of different baseline exposure to the fisheries sector withing the control group, which can be suggesting heterogeneous treatment effects, for example if the policy change is more consequential for areas with larger initial holdings and greater capacity to expand.

Most other indicators also show substantial heterogeneity within each group in both periods. For 2009–2014, treatment municipalities were on average more affluent and had significantly lower unemployment rates than controls—which guided the government's decision to remove them from the regional aid area, as income is directly included in the district index, and unemployment proxies two of its components. There are no statistical differences in the sectoral indicators for fisheries. In the post-treatment period, the gap between the groups in average levels of quota holdings widen in favor of the control municipalities, despite their less favorable pre-policy economic conditions. Sectoral indicators remain stable across periods in both groups, implying that the treatment-control gap in quota accumulation is not driven by differential sectoral dynamics. While baseline quota holdings and sectoral exposure are similar across groups, significant pre-treatment differences in income and unemployment motivate their inclusion as controls to address the omitted variable concern discussed above.

To credibly attribute post-treatment differences in quota holdings to the change in aid eligibility, treatment and control groups must exhibit parallel trends in the pre-treatment period. In my setting, robust identification is inherently difficult regardless of trend patterns, but examining pre-treatment trends is still informative for understanding whether treated and control municipalities evolved similarly before the policy change. Figure 8 plots the development in average quota holdings in tonnes for owners in treatment and control municipalities. Quota holdings are measured at year-end, so the period is shifted to 2010–2018 in the plot. Both groups follow similar trajectories until 2015, after which quota accumulation continues for the control group but levels off for the treatment group. The differences persist through the post-treatment period. Year-to-year variation is substantial for both groups, particularly in the period after the eligibility change, suggesting that identifying treatment effects will be difficult. Nevertheless, the co-movement in quota holdings prior to the policy change suggests that the development in quota holdings in firms in control municipalities provide a reasonable comparison group for exploring post-treatment developments.

6.2 Event-Study Estimates: Dynamic Patterns Around the Policy Change

Next, I present event-study estimates that account for municipality-level heterogeneity and time-varying shocks, providing a check on pre-treatment trends and a descriptive view of how quota holdings evolved after the policy change. Figure 9 plots dynamic treatment effects estimated from three nested specifications: (i) a baseline model without controls, serving as a benchmark for the raw policy effect; (ii) an extended model with time-varying municipality characteristics; and (iii) a specification that adds owner and year fixed effects. Appendix Table A3 reports the underlying regression estimates and additional specifications.

Pre-treatment coefficients are generally close to zero and statistically insignificant, though they exhibit a mild positive pattern, raising concerns about the parallel trends assumption. All three models include individual pre-treatment coefficients that are statistically significant; however, joint F-tests fail to reject the null that

[22] Given the small sample of four control and four treatment municipalities, it is difficult to statistically ascertain whether there are differences between the two groups.

	2009-2014			2015-2017	
	Control	Treated	Diff.	Control	Treated
Cod quota (tonnes)	1069.32	905.70	-163.62	1511.67	1014.68
	(466.61)	(1178.39)		(644.41)	(1101.19)
Quota owners	11.17	11.67	0.50	11.33	12.17
	(5.62)	(12.92)		(5.25)	(13.04)
Mean income (1000)	386.55	428.73	42.18***	405.67	448.07
	(21.49)	(41.28)		(12.05)	(48.73)
Population (1000)	7.46	10.07	2.61	7.61	10.51
	(4.19)	(8.28)		(4.29)	(8.68)
Fishers (%)	3.46	5.01	1.55	3.08	4.92
	(2.30)	(3.80)		(2.00)	(3.89)
Migration rate (%)	-0.23	-0.05	0.18	-0.15	-0.12
	(0.52)	(0.53)		(0.26)	(0.56)
Process. empl. (%)	3.03	4.06	1.03	3.25	4.87
	(1.94)	(3.39)		(2.14)	(2.87)
Unemployment (%)	1.09	0.70	-0.39***	1.32	1.23
	(0.23)	(0.46)		(0.58)	(0.83)

Table 7: Summary Statistics for Treatment and Control Units
Note. Municipality means with standard deviations in parentheses. Treatment municipalities lost eligibility for regional in 2014. Four municipalities are included in the treatment group and four in the control group. 70 unique owners in treatment group, 63 in control.
Diff. denotes the pre-treatment difference between treated and control group means. Significance levels from two-sample t-tests: $^{*}p < 0.05, ^{**}p < 0.1, ^{***}p < 0.01$.

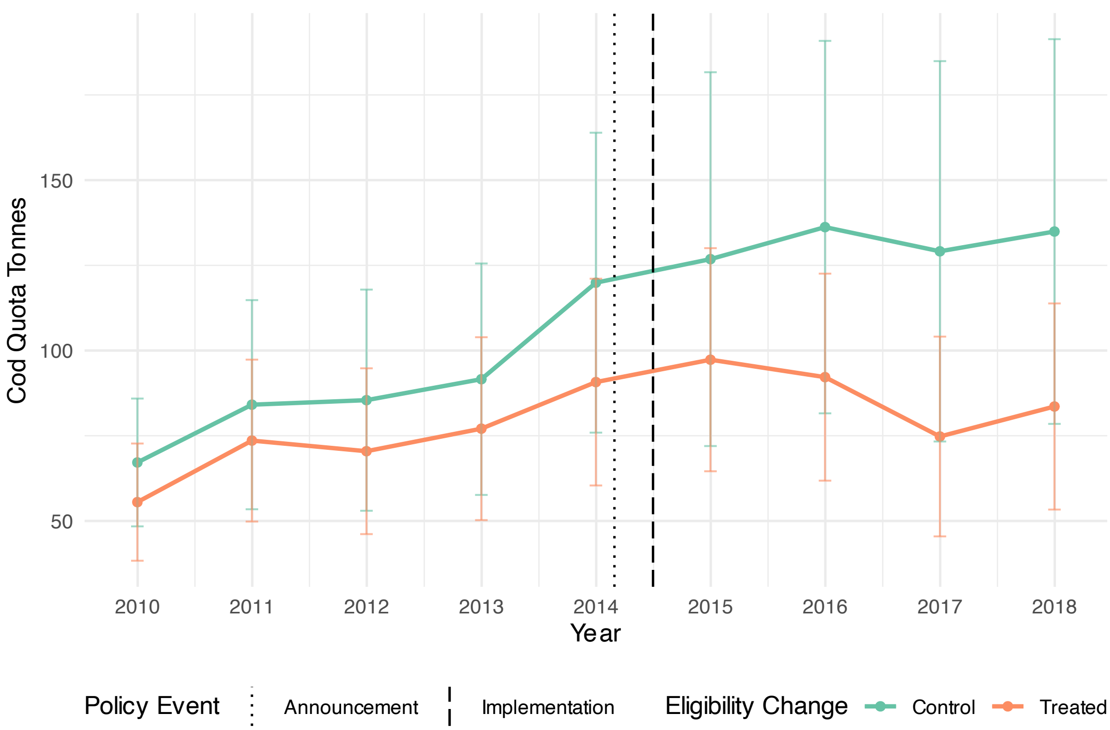

Figure 8: Average Owner–level Coastal Cod Quota Tonnes, Treated vs. Controls
Note. Quota holdings measured at year-end. Points represent group means for quota holdings for all owners across municipalities. Vertical lines show when the new regional aid area was announced on the Norwegian Government's website, and when the law went into effect. Error bars represent 95% confidence intervals.

all pre-treatment effects are zero, suggesting that evidence of systematic pre-trends is weak, possibly due to low statistical power.

Post-treatment estimates display a consistent pattern across specifications: coefficients decline over the first two years following the policy change and then increase slightly in the third year. Interpretation of longer-run dynamics is limited by the short post-treatment window, but the observed persistence can be consistent with a sustained reduction in quota holdings following the exclusion of treated municipalities from the regional aid area, although the data are insufficient for making causal inference. The estimates are smaller and imprecise in the baseline specification, yet the directional effects align with those from more demanding specifications. Point estimates imply reductions in quota holdings of 20–40 tonnes, a meaningful share of the average ownership of 70 tonnes among resident owners across the entire period. Confidence intervals remain stable across post-treatment periods.

6.3 Difference-in-Differences Estimates

Table 8 reports the corresponding DD estimates for the set of specifications discussed above, including two additional specifications: one that adds demographic and economic controls without fisheries variables (structural specification), and a model including only owner fixed effects.[23] The outcome is owner-level quota holdings measured in tonnes.

The DD-estimate is negative across all model specification. The estimate is highly imprecise in the baseline model, but both precision and magnitude rises once I control for time-varying characteristics and fixed effects. The effect is economically meaningful: losing funding eligibility is associated with a reduction in cod quota holdings of between 30 and 40 tonnes, which is substantial given that the average pre-treatment average for these firms was 96 tonnes. Including municipality controls increases the precision and size of the estimates, whereas adding owner fixed effects absorbs cross-sectional heterogeneity, attenuating the estimate and inflating standard errors so that the effect of the policy is no longer statistically significant at conventional levels. Incorporating year fixed effects increases magnitude and precision by isolating policy-induced changes.

Mean income remains positively associated with quota holdings in all models, indicating that municipalities with stronger economic performance tend to host owners with more quota. As discussed earlier, since income influenced the eligibility decision, omitting it could bias the difference-in-differences estimate upward if treated municipalities experienced faster income growth, thereby making the negative effect of the subsidy reduction appear smaller. Conversely, if mean income was negatively affected by the reduced availability of public subsides, controlling for income will absorb some of the policy's indirect effect on quota holdings. In that case, the estimated treatment effect would also be attenuated, as some of the post-treatment decline would be attributed to income rather than to the policy change.

In contrast, and unexpectedly, unemployment is positively correlated with quota holdings. Since lower unemployment levels increased the likelihood of losing aid eligibility, omitting unemployment could bias the difference-in-differences estimate upward if treated municipalities followed a different unemployment trend, overstating the negative effect. However, including it as a control could also influence the DD estimate if losing aid eligibility affects unemployment levels. If unemployment increases as a result of treatment, including it as a control would absorb part of the policy's indirect positive impact on quota holdings, increasing the estimated negative treatment effect.

All three sectoral indicators are negatively associated with quota holdings in column 3, but only the employment share in the fish processing industry has a significant effect. This is counterintuitive, as the variable represents industry presence and infrastructure, which likely correlates positively with quota holdings. One explanation is that in the group of municipalities I study—where the coastal cod fishery is relatively marginal—greater industry presence reflects specialization in other fisheries, and lower quota holdings of cod quota. Conversely, in municipalities with a smaller fishing industry, coastal cod might play a more central role, given that it is not the main fishery targeted in any region along the western coast. The effect of process-

[23] None of the owners in my sample move between treatment and control municipalities, so municipality fixed effects would not provide any additional information for estimation.

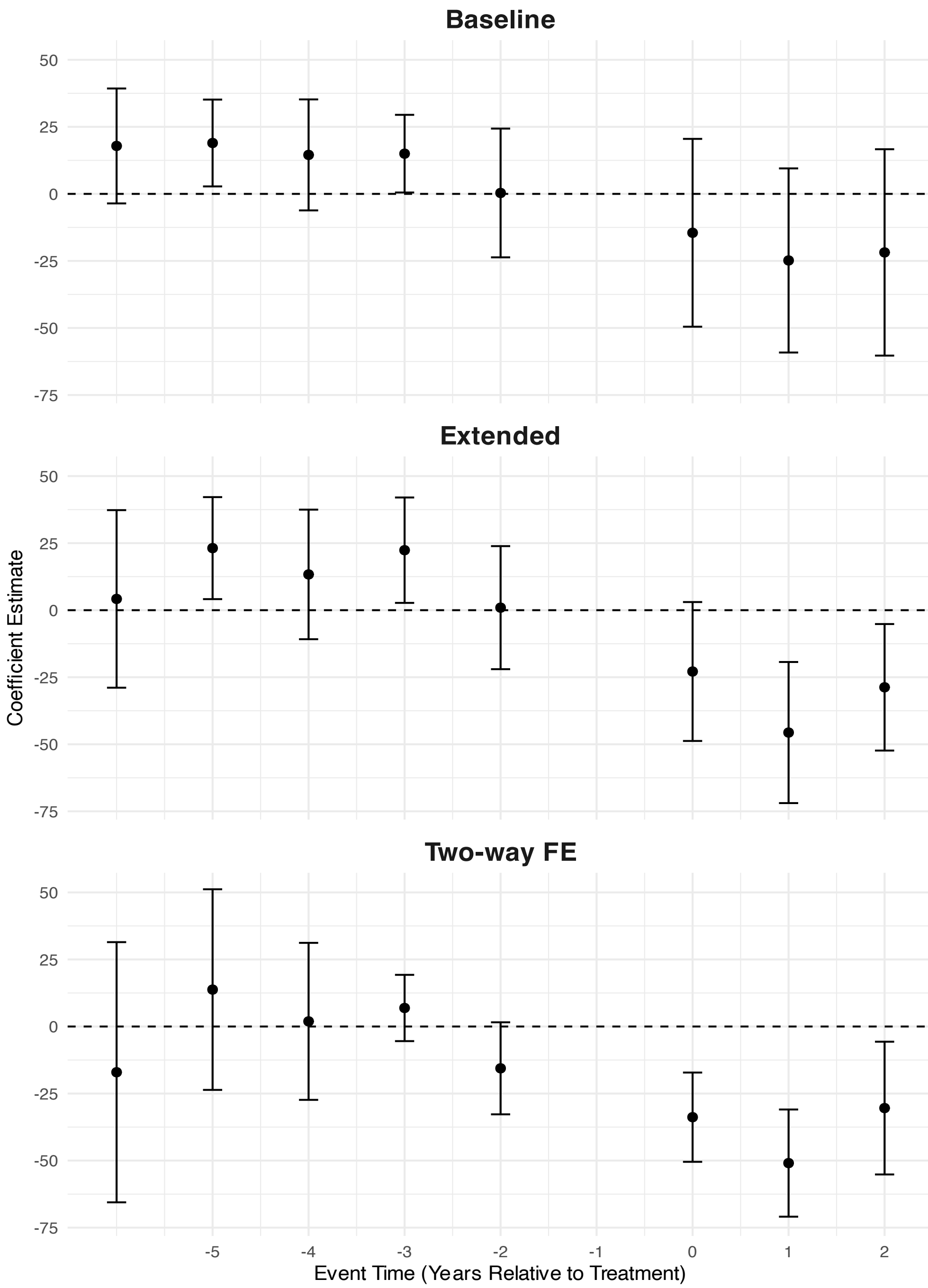

Figure 9: Dynamic Treatment Effects from Event Study Models: Coefficient estimates and 95% confidence intervals for the Baseline, Extended and three-way fixed effects model. Note. The x-axis represents event time (years relative to the treatment year), with the first pre-treatment period (2014) serving as the reference. The y-axis shows the estimated treatment effects relative to the reference year.

ing employment disappears when I control for fixed effects in columns (4) and (5), while the other fisheries control become positive. Taken together, the results imply that the negative association could be driven by between-municipality differences, aligning with the structural explanation, but the limited variation for the industry indicators makes inference difficult.

6.4 Robustness Checks: Bootstrap and Collapsed Windows

Table 9 reports bootstrap-adjusted confidence intervals and p-values for the main specifications of the DD model. Across all specifications, the restricted bootstrap (WCR) does not reject the null at conventional levels, while the less conservative unrestricted bootstrap (WCU) generally agrees, except for the Extended specification, where WCU indicates significance at the 5% level. The divergence warrants caution because, as MacKinnon and Webb (2018) emphasize, divergences between WCR and WCU signal unreliable inference. By contrast, both bootstrap variants agree for the two-way FE model despite conventional cluster-robust standard errors suggesting significance. Overall, these patterns underscore the fragility of inference in my case where treated clusters are few; as uncertainty grows, magnitudes should be interpreted only as indicative.

Table 10 displays estimates from the collapsed and windowed analysis. Column (1) collapses the entire period into a single pre- and post-treatment period, excluding 2014, and computes municipality-level averages weighted by the number of owners each year. The estimated effect of losing eligibility remains negative, but is substantially reduced compared to in the full-period specification and imprecisely estimated. This attenuation could reflect the reduced influence of later post-treatment years where the effect appears strongest according to the event-study and windowed estimates, while the larger standard error reflect the removal of time series variation.

Columns (2)-(6) present results from models estimated on expanding windows centered on the 2014 policy change, using the "Extended" specification from Table 8. In the narrowest window (±1 year), the interaction term is close to zero and statistically insignificant. This implies that the policy effect did not materialize immediately—a pattern consistent with lagged adjustment in quota holdings following a shift in the broader economic climate of treated municipalities. Adding years yields consistently negative effects, with the largest negative estimate occurring in the sample including two years before and after treatment. This pattern aligns with the event study results, where the negative effect peaks in lag 1 (2016). The stability of these estimates across windows, together with the overlap between collapsed and windowed confidence intervals, suggests that the main findings are not driven by serial correlation, but are constrained by low power in the collapsed design.

	(1) Baseline	(2) Structural	(3) Extended	(4) Owner FE	(5) Two-way FE
RIAxPOST	-31.856	-40.643 **	-40.804 ***	-30.273	-35.172 *
	(28.196)	(15.374)	(11.820)	(17.130)	(10.512)
Mean income (1000)		0.000	0.001 ***	0.001 **	0.001
		(0.000)	(0.000)	(0.000)	(0.000)
Unemployment (%)		19.869	27.555 ***	22.735 *	34.244 **
		(13.683)	(6.814)	(9.244)	(7.183)
Net Migration (%)		-12.951 *	-14.788 *	-7.284	-4.839
		(6.014)	(6.411)	(5.017)	(6.627)
Fishers (%)			-1.454	1.301	8.001
			(1.426)	(8.410)	(9.923)
Process. empl. (%)			-6.171 *	-3.985	-0.722
			(2.764)	(3.594)	(1.866)
Landing Plants			-1.264	0.002	1.373
			(0.899)	(1.143)	(0.654)
N	830	830	830	823	823
Owner N				126	126
Year N					9
Adj. R^2	0.020	0.028	0.042	-0.110	0.025

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 8: Regression Difference-in-Differences Estimates: Effect of Losing Regional Aid Eligibility on Coastal Cod Quota Holdings of Owners.
Note. Outcome is quota holdings (tonnes) at the owner level. Standard errors clustered at the municipality level. Within R^2 reported for fixed effects models. 7 singleton observations are dropped from the models with owner fixed effects.

Model	Estimate	P-value	Specification	P-value Boot	95% CI	N Observations
Baseline	-31.86	0.259	Restricted	0.315	[-87.26, 33.04]	830
			Unrestricted	0.444	[-108.18, 44.47]	
Extended	-40.80	0.001	Restricted	0.090	[-66.27, 7.03]	830
			Unrestricted	0.043	[-80.12, -1.49]	
Owner FE	-30.27	0.078	Restricted	0.132	[-56.91, 25.27]	823
			Unrestricted	0.067	[-69.97, 9.42]	
Two-way FE	-35.17	0.012	Restricted	0.101	[-65.39, 19.46]	823
			Unrestricted	0.081	[-77.87, 7.53]	

Table 9: Wild Cluster Bootstrap Inference: Effect of Losing Regional Aid Eligibility on Coastal Cod Quota Holdings of Owners.
Point estimates are from DD regressions of effect of regional policy change on cod quota holdings. Confidence intervals and P-values are from a wild cluster bootstrap procedure using Webb weights (B = 9,999), clustered by municipality (NC = 8).

	Pre/Post	±1 Years	±2 Years	±3 Years	±4 Years	±5 Years
POST	26.149	-4.135	22.774	26.705 *	28.305 *	27.887 *
	(29.152)	(17.154)	(11.956)	(13.484)	(12.468)	(14.106)
RIA	-64.647	-40.441 *	-24.853	-25.684	-22.965	-26.379
	(58.598)	(19.359)	(16.216)	(16.407)	(15.821)	(15.928)
RIAxPOST	-14.773	-0.025	-52.160 *	-46.816 *	-48.097 **	-44.016 *
	(33.840)	(24.419)	(23.295)	(18.863)	(17.304)	(18.479)
N	16	185	371	557	651	739
Adj. R^2	0.476	0.015	0.026	0.037	0.040	0.046

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 10: Effect of Losing Regional Aid Eligibility on Coastal Cod Quota Holdings: Collapsed and Windowed Analysis
Note. Standard errors in the Pre/Post model are adjusted for small sample size. In the windowed analysis, they are clustered at the municipality level. All specifications exclude 2014. Windowed analysis is centered on 2014.

7 Conclusion

Technological innovation and the adoption of market–based management systems has accelerated consolidation of activity and ownership in commercial fisheries worldwide, with economic and social implications for coastal communities. One way local governments can attempt to counteract or adapt to this process is by providing investment subsidies to their fishing industries. In this study, I document the extent and composition of such subsidies across all Norwegian municipalities over nearly two decades (2001–2019). To do so, I construct a comprehensive dataset on municipal business development grants, complemented by data on fisheries–related grants from a state–run agency that administer national investment support across Norway, and link these to municipality characteristics and detailed register data on quota ownership. Using this dataset, I first provide descriptive evidence on the spatial and temporal patterns of subsidy provision and explore how these patterns correlate with local economic conditions and quota ownership in three major catch–share fisheries. Second, I exploit a 2014 policy change that removed a small set of western coastal municipalities from Norway's regional aid area to explore whether losing access to general investment subsidies coincides with changes in quota holdings in the northern coastal cod fishery, using a difference–in–difference design.

My descriptive analysis shows that between 2001 and 2019, 173 Norwegian municipalities allocated roughly 200 MNOK to fisheries–related projects, corresponding to an average annual per capita amount of about NOK 132. Provision was highly uneven across space and time, with pronounced regional clusters and systematically higher support in rural municipalities. The intensity of subsides peaked during 2008—2014, coinciding with the expansion of the structural quota system, and was dominated by grants for vessel and quota purchases. Allocation was highly concentrated with a few municipalities accounting for most transfers, and fiscal health appears to play only a minor role in explaining these patterns. Correlation patterns indicate that per capita subsidies are associated with quota ownership shares in coastal fisheries, but not in the ocean–going trawler fleet, implying that both measures reflect underlying economic dependence on the fishing industry. I also find that municipalities with higher subsidy allocations over the full period show a negative correlation with change in quota holdings for northern coastal cod.

The difference–in–differences analysis suggests that losing eligibility for regional investment aid is associated with a reduction in quota holdings in the coastal cod fishery. Estimates indicate declines of roughly 30–40 tonnes per owner, a meaningful reduction given that treated owners held about 76 tonnes on average before the policy change. Event–study and windowed estimates indicate that the effect strengthened in the second year after treatment, which could indicate a lagged adjustment to changing investment conditions. These results should be interpreted as a reduced–form estimate of how losing access to regional investment aid affected quota holdings, through multiple potential channels—not solely by constraining quota–specific investments. However, the findings warrant careful interpretation: with few treated municipalities, statistical inference is highly uncertain, and bootstrap results reveal that the estimated effect is more imprecise than conventional methods imply. So although the estimates suggest a negative policy association, magnitudes should be regarded as indicative rather than conclusive.

This study offers a systematic account of municipal subsidies to the fisheries sector in a catch-share setting—a dimension that has received limited attention in the broader literature on fisheries subsidies, which typically focuses on how they promote overcapacity and stock depletion in the open access case. By examining a context where property rights are well established and quotas tradable, the analysis provides a descriptive basis for considering how local governments allocate scarce fiscal resources to an industry with capped production and investments center on quota acquisition. The observed concentration of subsidies in vessel and quota purchases, and prevalence of general subsidy provision in rural municipalities, is noteworthy given the vulnerability of coastal communities and the fiscal constraints they face.

The difference-in-differences analysis, while subject to considerable uncertainty, suggests that losing access to public funding may have a negative effect on quota holdings. In the context of ongoing consolidation and increased privatization of harvesting rights in commercial fisheries, policies that change access to investment funding in a region could alter the spatial distribution of economic rents and the resilience of coastal communities. These preliminary findings therefore raise the question of whether public investments funds could play a role in mitigating the detrimental consequences of market–based reforms for local communities.

This study provides a starting point for systematic analysis of determinants of local subsidy provision and its implications for resource ownership. Future work should formalize the descriptive patterns documented here in a theoretical framework and perform more rigorous empirical analyses of what determines local government subsidy allocation. Likewise, further research is needed to assess whether and how public subsidies influence local resource ownership, given the documented importance in the literature of resource ownership structures for regional economic conditions. These questions are likely to gain importance as market–based management systems become more prevalent in commercial fisheries, and other resource industries, making investment subsidies a potential policy tool for local governments in shaping ownership outcomes in their favor.

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A Appendix

Old Muni. No.	Old Muni. Name	Year Merged	New Muni. No.	New Muni. Name
0704	Tønsberg	2016	0704	Tønsberg
0720	Stokke	2016	0704	Tønsberg
0706	Sandefjord	2016	0710	Sandefjord
0719	Andebu	2016	0710	Sandefjord
0709	Larvik	2017	0712	Larvik
0728	Lardal	2017	0712	Larvik
0702	Holmestrand	2017	0715	Holmestrand
0714	Hof (Vestfold)	2017	0715	Holmestrand
0716	Re	2001	0716	Re
0718	Ramnes	2001	0716	Re
0722	Nøtterøy	2017	0729	Færder
0723	Tjøme	2017	0729	Færder
1154	Vindafjord	2005	1160	Vindafjord
1159	Ølen	2005	1160	Vindafjord
1214	Ølen	2001	1160	Vindafjord
1503	Kristiansund	2007	1505	Kristiansund
1556	Frei	2007	1505	Kristiansund
1569	Aure	2005	1576	Aure
1572	Tustna	2005	1576	Aure
1804	Bodø	2004	1804	Bodø
1842	Skjerstad	2004	1804	Bodø
1901	Harstad	2012	1903	Harstad - Hárstták
1915	Bjarkøy	2012	1903	Harstad - Hárstták
1723	Mosvik	2011	5053	Inderøy
1729	Inderøy	2011	5053	Inderøy
1624	Rissa	2017	5054	Indre Fosen
1718	Leksvik	2017	5054	Indre Fosen

Table A1: Municipal mergers in Norway, 2001-2019

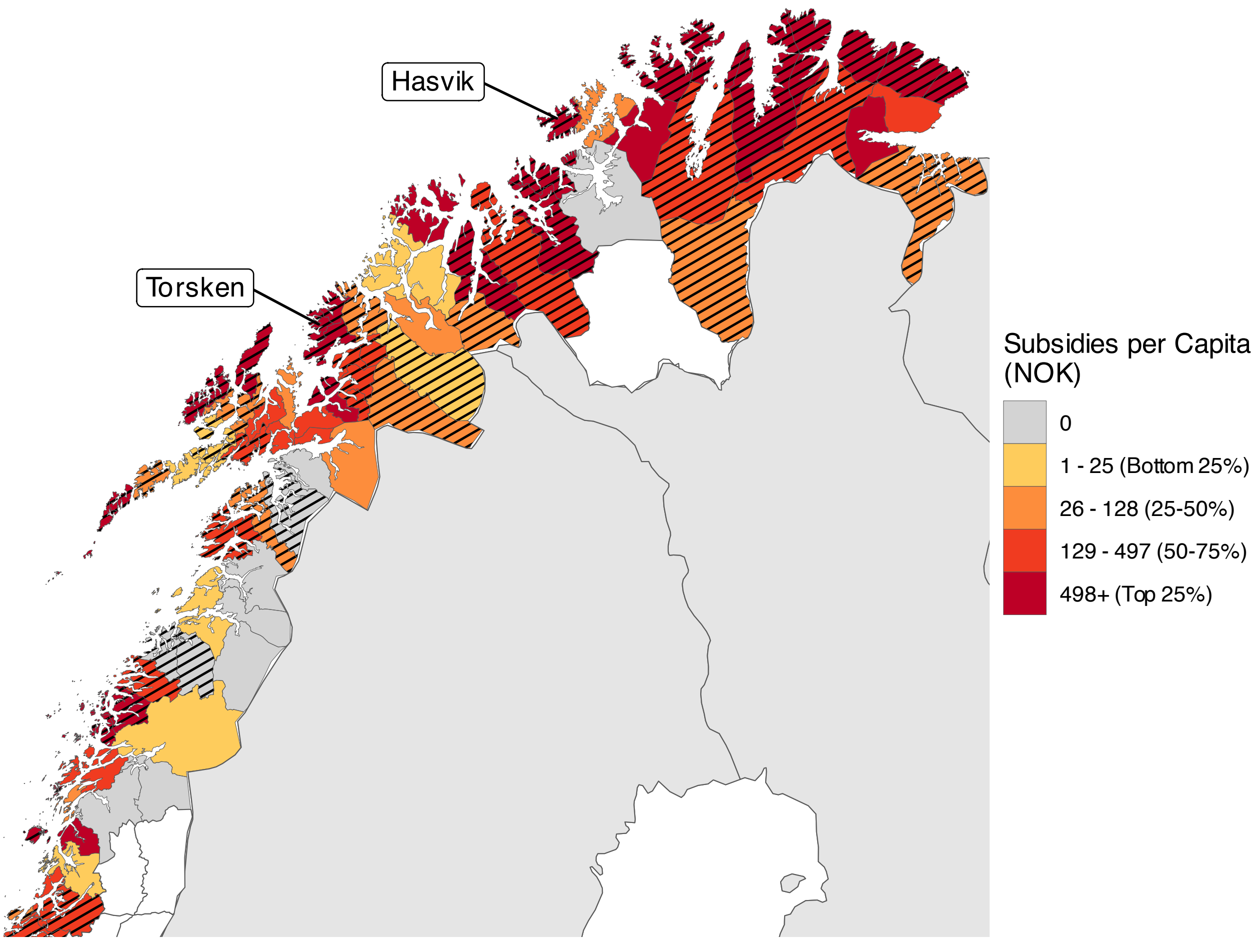

Figure A1: Total Amount of Subsidies Over the Period 2001 to 2019 from Municipalities to Fisheries-Related Projects in Northern Norway.
Note. All subsidy figures are aggregated according to the 2019 municipal structure. Over the observation period, 27 municipalities were consolidated into 13 new administrative units. For these cases, subsidy amounts have been summed across all years to correspond with the post-merger boundaries.
Least central municipalities are hatched. Non-fishing municipalities have a white fill. These had no active fishers during 2001-2019 and no coastline, or did not provide any grants in the period 2001-2019. Named municipalities are the three with the highest grant sums per capita for the period.

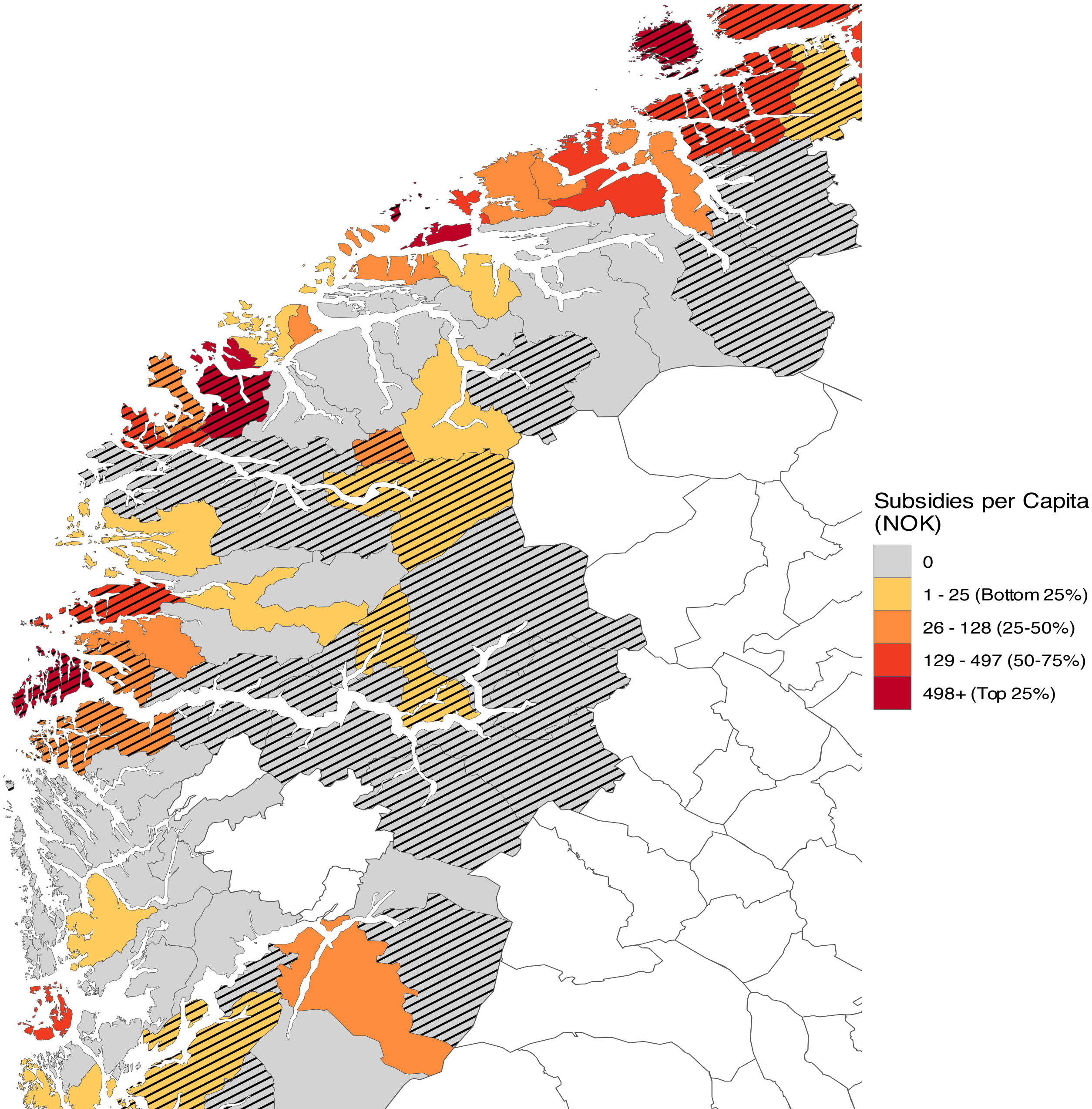

Figure A2: Total Amount of Subsidies Over the Period 2001 to 2019 from Municipalities to Fisheries-Related Projects in Western Norway.

Note. All subsidy figures are aggregated according to the 2019 municipal structure. Over the observation period, 27 municipalities were consolidated into 13 new administrative units. For these cases, subsidy amounts have been summed across all years to correspond with the post-merger boundaries.

Least central municipalities are hatched. Non-fishing municipalities have a white fill. These had no active fishers during 2001-2019 and no coastline, or did not provide any grants in the period 2001-2019. Named municipalities are the three with the highest grant sums per capita for the period.

	Before Matching			After Matching			
Variable	Treated	Control	SMD	Treated	Control	SMD	Red. (%)
Cod quota (tonnes)	905.7	1267.7	-0.281	905.7	1069.3	-0.127	54.800
Population (1000)	9.78	10.52	-0.081	9.78	7.41	0.261	-221.411
Fishers (%)	5.97	4.06	0.407	5.97	4.44	0.327	19.695
Mean income (1000)	386.0	328.2	1.533	386.0	347.8	1.013	33.948
Process. empl. (%)	3.52	3.27	0.099	3.52	3.31	0.084	15.355
Unemployment (%)	0.78	1.33	-1.016	0.78	1.18	-0.732	27.941
Vessels	10.00	13.06	-0.227	10.00	9.67	0.025	89.114
Quota owners	11.67	13.33	-0.114	11.67	11.17	0.034	69.890

Table A2: Covariate Balance Before and After Propensity Score Matching
Note. Mean values for treated and control municipalities, standardized mean differences (SMD), and percentage reduction in imbalance following one–to–one nearest–neighbor matching with replacement. Matching is based on logit propensity scores using pre-treatment averages (2009–2014) of quota holdings, population, income, unemployment, fishers as share of population, employment in fish processing, number of vessels, and number of quota owners, with exact matching on county. Matching performed on four treated municipalities and 156 potential controls.

	Baseline	Extended	Owner FE	Two-way FE
Treatment x Lead 6	17.874	4.203	-17.637	-17.054
	(10.932)	(16.892)	(24.250)	(24.752)
Treatment x Lead 5	18.974 *	23.146 *	15.529	13.761
	(8.258)	(9.705)	(19.347)	(19.084)
Treatment x Lead 4	14.533	13.337	2.321	1.917
	(10.558)	(12.325)	(12.453)	(14.935)
Treatment x Lead 3	14.994 *	22.375 *	10.601	6.907
	(7.389)	(10.027)	(5.886)	(6.304)
Treatment x Lead 2	0.343	0.948	-10.325	-15.593
	(12.248)	(11.706)	(9.668)	(8.755)
Treatment x Lag 0	-14.508	-22.864	-30.149 **	-33.815 ***
	(17.864)	(13.213)	(9.717)	(8.492)
Treatment x Lag 1	-24.825	-45.627 ***	-47.769 ***	-50.934 ***
	(17.515)	(13.422)	(10.302)	(10.196)
Treatment x Lag 2	-21.828	-28.751 *	-26.403	-30.419 *
	(19.629)	(12.035)	(14.289)	(12.630)
N	830	830	823	823
Adj. R^2	0.017	0.030	0.098	0.044
F-test (Pre = 0)	0.990	0.978	0.446	0.443
F-test (Post = 0)	0.325	0.008	0.000	0.000

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table A3: Event Study Estimates of the Effect of the 2014 Regional Policy Change on Cod Quota Holdings for Owners in Treated Municipalities
Note. Standard errors clustered at the municipality level in parentheses. Data covers period 2009–2017, event time is centered on 2014. Reported F-tests assess the joint significance of pre–treatment post–treatment event–time coefficients.

As technological change and market-based management systems reshape the fishing industry, many coastal communities face mounting challenges. Public investment subsidies are one potential policy response, yet little is known about their scale, allocation, or relationship to resource ownership in regulated fisheries. In this paper, I address this gap by constructing a novel dataset covering municipal and statelevel grants to the Norwegian fishing industry and linking these records with detailed register data on quota holdings. Using this dataset, I document the magnitude, composition, and spatial distribution of subsidies across Norwegian municipalities from 2001 to 2019 and explore correlations with quota ownership. Municipal transfers totaled roughly NOK 200 million, concentrated in rural areas and dominated by grants for vessel and quota purchases. Subsidy provision and quota ownership co–move in coastal fisheries, while fiscal health plays only a minor role. As an illustrative case of the influence of subsidy eligibility on quota ownership, I examine a revision of Norway's regional aid area, which removed several coastal municipalities from eligibility for general investment support. Results—indicative rather than conclusive—suggest a possible decline in quota holdings in the coastal cod fishery following the reform. In sum, the paper provides an empirical foundation for understanding how local governments use targeted investment subsidies under rights–based fisheries management.

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