Handelshøyskolen BI

GRA 19703 Master Thesis

Thesis Master of Science 100% - W

Predefinert informasjon

Startdato:	09-01-2023 09:00 CET	**Termin:**	202310
Sluttdato:	03-07-2023 12:00 CEST	**Vurderingsform:**	Norsk 6-trinns skala (A-F)
Eksamensform:	T		
Flowkode:	202310||11184||IN00||W||T		
Intern sensor:	(Anonymisert)		

Deltaker

Navn:	Nuod Yoseph Ghezai og Karl Edvard Johannson

Informasjon fra deltaker

Tittel *:	Local Economic Structures and their Impact on MPs' Engagement in Environmental Debates: A Case Study of Rogaland
Navn på veileder *:	Jon Fiva & Oda Nedregård

Inneholder besvarelsen konfidensielt materiale?:	Nei	**Kan besvarelsen offentliggjøres?:**	Ja

Gruppe

Gruppenavn:	(Anonymisert)
Gruppenummer:	199
Andre medlemmer i gruppen:	

Local Economic Structures and their Impact on MPs' Engagement in Environmental Debates: A Case Study of Rogaland

Hand-in date: 03.07.2023

Campus: BI Oslo

Examination code and name:
GRA 1970 Master Thesis

Authors:
Nuod Ghezai & Karl Edvard Johannson

Supervisors:
Jon Fiva & Oda Nedregård

Study Programme:
Master of Science in Applied Economics

Abstract

This study examines whether Members of Parliament (MPs) from Rogaland, Norway, are influenced by the local economic structure in their home constituency during parliamentary debates on environmental issues. By analysing parliamentary speeches, economic data, and voter information, we employ natural language processing techniques, including Structural Topic Modelling and sentiment analysis. Our objective is to determine if Rogaland MPs demonstrate a stronger connection to their local economic structure when engaging in debates within the realm of environmental concerns. Our findings indicate that elected MPs from Rogaland are highly involved in discussions pertaining to energy, petroleum, and emissions. Furthermore, we observe a significant deviation among Rogaland MPs from their party colleagues on these specific topics. Our interpretation suggests that MPs from Rogaland prioritize representing local concerns in parliamentary debates.

Contents

1. Introduction

The Norwegian Constitution states: *"Natural resources shall be managed on the basis of comprehensive long-term considerations which will safeguard this right for future generations as well."* (Grunnloven, 1814, §112). With this in mind, Norway is in a unique position when balancing economic growth and environmental issues, and political actors are trying to reconcile the paradoxical goals of climate leadership and petroleum production (Lahn, 2019, p. 5). To illustrate this, the former Prime Minister Erna Solberg (H) stated: *"Somebody has taken the climate debate, and moved it away from the climate and over to becoming an oil debate"* (Adresseavisen, 2017) cited in (Lahn, 2019, p. 20). With these propositions in mind, our thesis aims to analyse how environmental issues are debated in Parliament.

Today, Norway stands as a major global supplier of petroleum (EIA, 2022), with the sector playing a crucial role in contributing to nearly half of the country's total exports and over one-fourth of government revenues in the past two decades (SSB, 2023b) Additionally, petroleum policies have long prioritized regional employment and local value creation. Notably, the pursuit of regional employment has yielded particularly significant results in the western regions of Norway, with Rogaland County standing out (Norwegian Petroleum, 2022). This remarkable growth and influence of the petroleum industry have shaped not only the economic structure of Norway and Rogaland but also the political dynamics (Collier, 2010), as mentioned by Solberg.

Rogaland serves as the central hub for Norwegian petroleum activities in the North Sea, with a multitude of companies and a high concentration of employment within the industry (Norwegian Ministry of Petroleum and Energy, 2014, p. 13) The economic structure of Rogaland heavily relies on the petroleum sector, making it the largest petroleum county in Norway. Moreover, the substantial employment and value creation generated by the petroleum industry in Rogaland highlights its significance for the local economy.

Extensive literature explores the influence economic structure has on politics. Through an evaluation a notable hypothesis emerges: firm size within an industry holds paramount importance when considering the implications for political influence in the context of economic structure (Salamon & Siegfried (1977); Kaysen (1957); and Edwards (1955)). Examining the case of Norway and Rogaland, it can be argued that the petroleum industry holds political influence due to its significant contributions to government revenues, employment, and export earnings.

This thesis seeks to examine the level of engagement exhibited by MPs from Rogaland when discussing environmental topics in parliament and compare it with their party

colleagues. By leveraging the economic structure of Rogaland as a source of regional variation, we aim to discern whether MPs from Rogaland demonstrate a greater propensity of involvement in environmental debates within the parliamentary setting. Since voters can retrospectively punish incumbents if, for example, they fail to implement preferred policies (Austen-Smith & Banks 1989; Dewan & Shepsle, 2011). Implying that MPs from districts of interest have a clear incentive to adhere to their local constituencies.

It is important to note that the focus of this thesis lies in the overall coverage of environmental discussions, without delving into specific shocks or time periods, as the economic structure is considered a relatively static variable. By means of this, we have formulated the following research question.

How does local economic structure shape MPs' coverage of environmental topics?

Employing parliamentary speeches as a research tool presents several advantages for investigating our research question. Primarily, these speeches serve as reflection of political priorities, legislative agenda, government concerns, and public discourse and engagement. They offer a glimpse into the current state of the country, or region, covering various topics such as the economy, foreign affairs, reforms, and regulations. By analysing parliamentary speeches, we gain valuable insight into the preferences and priorities of MPs, specifically in relation to environmental topics. Our motivation is that these speeches can act as indicators of regional economic structures, as they contain variations that mirror characteristics of different regions.

In contrast, roll-call voting, which is commonly used as a measure of legislative behaviour, may not be suitable for capturing MPs' coverage of environmental topics. The high level of party loyalty observed in roll-call voting, with approximately 96% of MPs voting along party lines (Fiva et al., 2023, p. 6), limits the MPs ability to convey independent signals to their constituents and the local electorate (Finseraas et al, 2021, p. 740). The party-centred nature and decentralized candidate selection system influence the voting decisions of MPs, making it less reliable for assessing their individual stance on environmental issues.

By focusing on parliamentary speeches, we can overcome these limitations and obtain a more nuanced representation of MPs' engagement with environmental topics. The speeches act as a signalling effect, directly communicating the economic conditions and priorities of specific regions (Proksch & Slapin 2012; Lauderdale & Herzog 2016; Ash et al. 2017), cited in Finseraas et al. (2021, p. 740). This approach allows us to capture the variations in MPs' engagement towards environmental topics, providing an understanding of their representation of regional interest. It also gives us the opportunity to study within-party variations and to capture important developments in political processes.

To study parliament speeches over time, we employ the Structural Topic Model, a semi-supervised language processing model combined with a sentiment analysis. These

techniques allow us to use text-as-data to quantify speeches delivered in parliament debates. The Structural Topic Model (STM) integrates information of each speech, such as content of the speech, name of MP, political party, and electoral district of MPs. By incorporating large amounts of text data, the STM model can uncover underlying topics in parliamentary speeches (Roberts et al., 2014). This allows us to identify relationships between MPs and electoral district. In our case, we will analyse whether specific topics are more prevalent among specific MPs. The sentiment analysis enables us to identify the positive, negative, or natural sentiment expressed by a MP (Medhat et al., 2014).

In addition to our primary analysis, we will conduct a comparative examination between MPs from Møre and Romsdal and MPs from Rogaland to investigate potential variations in their engagement, coverage, and sentiment based on the economic structure of their respective regions. Møre and Romsdal are well-suited for this study, because of their major role in the fishing industry, with fish being Norway's second largest export (OEC, 2023). This supplementary analysis aims to provide a more comprehensive understanding of how economic context influences the MPs belonging to different political parties. By comparing the two regions, we can discern whether there are distinct patterns in the way MPs from Møre and Romsdal and Rogaland cover topics related to the economic structure of their constituencies. Through this supplementary analysis, we aim to expand our understanding of how the economic structure of a region influences the coverage and sentiment of MPs, thereby contributing to the broader discourse on the intersection of regional economics and political representation.

This research adds to the existing literature on the balance between regional and national interest by exploring the influence of economic structure on MPs' inclination to prioritize local concerns within the national parliament. While the representation of local interest can yield electoral advantages within specific districts it also introduces potential challenges when conflicting preferences of voters from different districts arise (Nedregård 2023). This dynamic can generate uncertainty regarding a party's policy stance, as MPs may need to make trade-offs between representing the interest of their home district over another.

An illustrative case highlighting the impact of economic structure on district imbalance is the "Corona package" enacted by the Norwegian government in the spring of 2022 (Regjeringen, 2020). Given the substantial reliance of the Norwegian economy on petroleum production, the Norwegian parliament approved a new and simplified scheme for deferred payment of taxes and fees during that period for the petroleum sector. This initiative received significant appreciation from voters in districts where the petroleum sector holds considerable prominence. However, in districts where the petroleum sector does not play a significant role, the support package faced criticism and was met with discontent (WWF, 2021). This political initiative exemplifies the challenge of striking a balance between the interest of voters in two distinct districts.

In previous research conducted by Finseraas (et al. 2021), a particular emphasis was placed on MPs from Rogaland as a point for assessing the impact of parliamentary debates, given the region's heavy reliance on the petroleum industry within its economic structure.

The research findings yielded intriguing insights, revealing distinctive patterns in the behaviour of MPs representing Rogaland. Notably, these MPs displayed a tendency to divert their attention away from environmental topics, instead prioritizing discussions centred around employment-related issues. In contrast, MPs from districts less reliant on the petroleum sectors capitalized in the context of declining oil prices to advocate for increased investment in environmentally sustainable industries. These findings challenge the conventional assumptions that economic downturns inherently impede the pursuit of climate friendly policy shifts. The response of MPs to economic challenges appears to be contingent upon the concentration of affected industries in different regions, highlighting the role of regional economic structure in shaping policy priorities within the parliamentary arena.

Given the significant concentration of the petroleum industry in Rogaland's economic structure, our aim is to demonstrate that topics related to the petroleum industry elicit a higher level of engagement among MPs representing Rogaland. And to do the same with Møre and Romsdal and fishery-related topics. The findings of our study are consistent with this hypothesis, and Rogaland MPs are significantly more involved in environmental topics that are related to emissions, energy and petroleum. These findings build on Finseraas et al. (2021); however, it is important to note that our thesis diverges from examining specific shocks and instead focuses on the broader scope of overall coverage.

2. Conceptual Framework

The process of selecting politicians involves voters endorsing a specific political party within their electoral region. The primary objective for politicians is to secure re-election, as remaining in power affords them the opportunity to shape political outcomes (Downs, 1957). Consequently, the politicians who effectively represent the interest of their constituents in parliament are rewarded by voters, thereby increasing their likelihood of re-election. To achieve this, politicians are incentivized to represent the concerns and preferences of their constituency, while also adhering to the overarching ideology of their party.

When voters assess the appropriateness of a candidate or a political party, they consider their personal economic circumstances and the potential consequences for their financial welfare (Kinder & Kiewiet, 1981). This deliberation regarding personal economic interest influences voter preferences, which, in turn, can influence MPs.

In this thesis, we will explore how MPs align themselves to voters through their parliamentary speech in two ways: *What* they talk about and *how* they talk. In other words, MP speech can be studied by topics and sentiment, to study how MPs communicate the interests and concerns of their electoral district. The topics spoken of and the way they are addressed (sentiment) are contingent upon the voter's interest, which are, in turn, influenced by the local economic structure of the district.

3. Norwegian Parliament Debate 1981 - 2021

3.1 Election System

Every four years, Norway elects 169 representatives to represent their electoral district and party in the Norwegian Parliament. The election ordinance outlines the regulations governing the electoral process, including who is eligible to participate in the election, how votes are counted to determine representatives, and the number of electoral districts. Norway is divided into 19 electoral districts which align with the pre-2020 county divisions, and voters cast their ballots in the district in which they reside (Stortinget, 2021).

Norway employs a proportional representation electoral system, which involves the selection of multiple representatives from each electoral district. This approach ensures that the distribution of parliamentary seats corresponds to the level of support for each political party. If a party secures 30% of the vote in a particular electoral district, they will receive roughly 30% of the district's seats in the Stortinget. Allocation of seats for electoral districts during parliamentary elections in Norway is determined by two factors: population size and land area. The latter is intended to grant districts with lower population greater representation in Stortinget (Stortinget, 2021).

3.2 Parliament Speech

The Norwegian Parliament operates within a set of strict rules governing parliamentary speeches. These regulations stipulate that all speeches must be directed towards the parliamentary president and strictly pertain to the topic under discussion (Fiva et al, 2023). Maintaining a formal tone, the audience is prohibited from engaging in rowdy displays of approval or disagreement. The length of speeches in the Norwegian Parliament is strictly regulated by parliamentary rules, 15 minutes for the first speech in an ordinary debate, followed by ten and three minutes for the second and third speech, respectively (Fiva et al., 2023)

Parliamentary speeches serve as an important means of communication, allowing legislators to convey their policy stances to colleagues and electoral stakeholders. The allocation of speech time is managed by the parliamentary presidentship, which then distributes the allocated time among party members. This allocated process requires senior party members to optimize the distribution of speech opportunities among their members. The specific delegation methods may vary across different political parties (Nedregård, 2023).

Additionally, speeches offer individual legislators an avenue to articulate their policy concerns and signal their disagreements with political compromises. In contrast to roll-call votes, MPs enjoy more discretion in their speeches, allowing them to voice their independent view. Findings from Fiva et al. (2023), confirms this, demonstrating legislators' social ties, background, gender, and age significantly influences their speeches in the Norwegian Parliament.

3.3 Party Coalitions and Environmental Debate in Parliament

Throughout Norwegian history, the political arena has been characterized by a left-right ideological spectrum. The primary division has traditionally existed between the left-leaning social democratic bloc and right-leaning conservative bloc. The left-wing is represented by two main prominent parties, namely the Socialist Left (SV) and the Labor Party (A). In contrast, the right-wing bloc is more heterogeneous, encompassing the Conservative (H), the Liberals (V), the Christian Democrats (KrF), and the Progress Party (FrP) (Nedregård, 2023). It is worth noting that the Centre Party (Sp), although traditionally aligning with the conservative bloc, participated in a coalition government with A and SV during the 2005-2013 period, and coalition government with A during the 2021-2025 period (Regjeringen, n.d.). In addition to these parties, the Green Party (MDG) and the Red Party (R), also hold seats in Parliament today. These parties can be placed in the centre and on the far left on the political axis respectively (Stortinget, 2023). In the centre, we have also placed a group 'Others', consisting of smaller parties in Parliament in our time period. These groupings give us the following political axis in Norwegian politics, along a left-right dimension, that we will use to sort tables and figures later in this thesis.

Table 1: Political Axis

Left bloc				No bloc		Right bloc			
R	SV	A	Sp	MDG	Others	KrF	V	H	FrP

Note: Norwegian political parties placed along a left-right dimension.

Having established the historical left-right dimensions within Norwegian politics, we turn our attention to the environmental discourse within the Norwegian Parliament. We aim to outline a short descriptive breakdown of the overall discussion pertaining to environmental topics.

Over the course of history, policies aimed at addressing emissions from the petroleum industry and political conflicts surrounding Norway's domestic petroleum emissions were prevalent in the late 1980s partly influenced by Prime Minister Gro Harlem Brundtland (A). A, with backing from unions representing petroleum industry workers, alongside H and FrP on the right, have consistently fostered an environment of stability and predictability for the petroleum industry, regardless of changes in government leadership (Sæther, 2017). On the other hand, a coalition of smaller political parties, generally advocating for stricter

domestic emission reductions, has emerged as a critical voice for more restrictive petroleum development. This group includes MDG, as well as R, SV, KrF and V (Reed, 2021).

Given the evolving discourse surrounding petroleum and climate, both A and H parties generally maintain a position that emphasizes a clear distinction between climate policy, aimed at reducing fossil fuel demand, and petroleum policy, focused on maximizing the economic benefits derived from petroleum production. This approach has been explicitly embraced by the previous H-led government (Lahn, 2019).

For instance, subsequent to the adoption of the Paris Agreement in 2015, V put forth a proposal to establish a commission tasked with evaluating the Norwegian petroleum taxation system considering the global temperature objectives outlined in the Paris Agreement. In a compromise reached between the V and the then-minority coalition of H and FrP, it was agreed upon that the government should present a comprehensive examination of the implications of the temperature targets specified in the Paris Agreement for Norwegian petroleum policy to the Stortinget. This led to a broad consensus across the political spectrum acknowledging the genuine economic risk associated with international climate targets, particularly regarding the management of petroleum resources (Innst. 2 S (2016–2017), p. 17).

In 2013, MDG secured a seat in the Storting, marking their debut, with a clear objective of phasing out Norwegian oil and gas production. They have continued to advocate for a managed and deliberate phase-out of the industry, including the establishment of a definitive end-date for Norwegian oil production (MDG, n.d.). Similarly, R also attained a seat in the Storting in 2017 and have supported this position. but have since moved away from setting a definitive end-date (Rødt, 2021). These two parties' introduction to Parliament illustrates the increased public and political attention to environmental issues.

Given the parliamentary dynamics, where major political parties rely on compromises with smaller, environmental conscious parties to form coalition governments, changes in parties' positions on petroleum development and introduction of new environmentally conscious parties in parliament are likely to have a substantial impact on Norway's future climate policy.

3.4 MPs from Rogaland in Parliament

The electoral district of Rogaland is allocated 14 seats in Parliament, determined by the region's population size. For illustration purposes, Oslo is designated 20 seats as the highest, while Aust-Agder are designated 4 seats which is the lowest (Stortinget, n.d.).

Examining the historical records, H and A has had the largest representation from Rogaland in Parliament, with a total of 30 MPs. This prominence of H and A parties underscores their dominance in Rogaland's political landscape. Following the two major parties, FrP is the third most represented party, with 21 MPs over our timeline (Stortinget, n.d.)

A notable observation is the absence of a representative from MDG in parliament for Rogaland. This occurrence can be attributed to the party's restrictive energy policies, par-

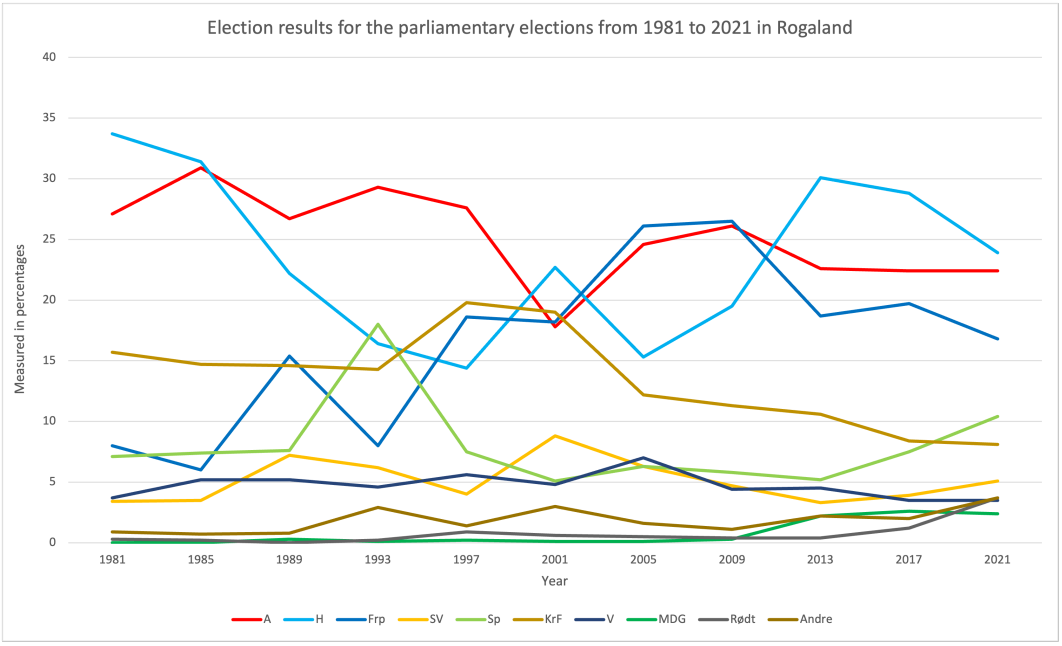
Table 2: Party Representation - Rogaland MPs

	R	SV	A	Sp	MDG	Others	KrF	V	H	FrP	Total
1981-1985	0	0	3	1	0	0	2	0	3	1	10
1985-1989	0	0	3	1	0	0	2	0	4	0	10
1989-1993	0	1	3	1	0	0	2	0	3	2	12
1993-1997	0	1	3	2	0	0	2	0	2	1	11
1997-2001	0	1	3	1	0	0	2	1	2	2	12
2001-2005	0	1	2	1	0	0	2	0	3	2	11
2005-2009	0	1	3	1	0	0	2	1	2	3	13
2009-2013	0	1	3	1	0	0	1	0	3	4	13
2013-2017	0	0	3	1	0	0	2	1	4	3	14
2017-2021	0	1	4	1	0	0	1	0	4	3	14
Total	0	7	30	11	0	0	18	3	30	21	120

Note: Number of MPs from Rogaland elected from each party in each government period in Parliament. Timeline aligns with our dataset. Data from Stortinget.

ticularly their vocal stance on limiting future petroleum exploration (MDG, n.d.). Voters in Rogaland may not be inclined to support a party that emphasizes such restrictions.

Figure 1: Election Results in Rogaland



Note: Shows elected political parties by number of MPs from Rogaland in Parliament. Source: Stortinget (n.d.).

The period spanning from 1981 to 2021 reveals the notable dominance of A and H, with FrP closely following suit in Rogaland. Analysing the timeframe between 1981 and 2001, it becomes apparent that the major parties, including A, H, and FrP, held a significant presence. Additionally, KrF was a popular choice among voters in Rogaland, but has seen a decline in popularity since 2001.

Examining the period from 2001 to 2021, a considerable decline in voter support for KrF becomes evident in Rogaland. Nonetheless, the major parties, A, H and FrP, maintained

their presence. It is worth mentioning the noteworthy growth of the Green Party, surpassing the KrF in popularity. This phenomenon may signify a shifting set of priorities among the electorate.

These findings serve as a complementary analysis to the aforementioned table, presenting an overview of the overall voter turnout in Rogaland disaggregated by political party.

3.5 MPs from Møre and Romsdal in Parliament

Møre and Romsdal have 9 allocated seats in Parliament. We can see that A is the biggest party over our time period, with 28 MPs, followed by H (19), KrF (16) and FrP (14) (Stortinget, n.d.).

Table 3: Party Representation - Møre and Romsdal MPs

	R	SV	A	Sp	MDG	Others	KrF	V	H	FrP	Total
1981-85	0	0	3	1	0	0	2	1	3	0	10
1985-89	0	0	4	1	0	0	2	0	3	0	10
1989-93	0	1	3	1	0	0	2	0	2	1	10
1993-97	0	0	4	3	0	0	2	0	1	0	10
1997-2001	0	0	3	1	0	0	2	1	1	2	10
2001-2005	0	1	2	1	0	0	2	0	2	2	10
2005-2009	0	1	2	1	0	0	1	1	1	2	9
2009-2013	0	0	3	1	0	0	1	0	1	3	9
2013-2017	0	0	2	1	0	0	1	1	2	2	9
2017-2021	0	0	2	1	0	0	1	0	3	2	9
Total	0	3	28	12	0	0	16	4	19	14	96

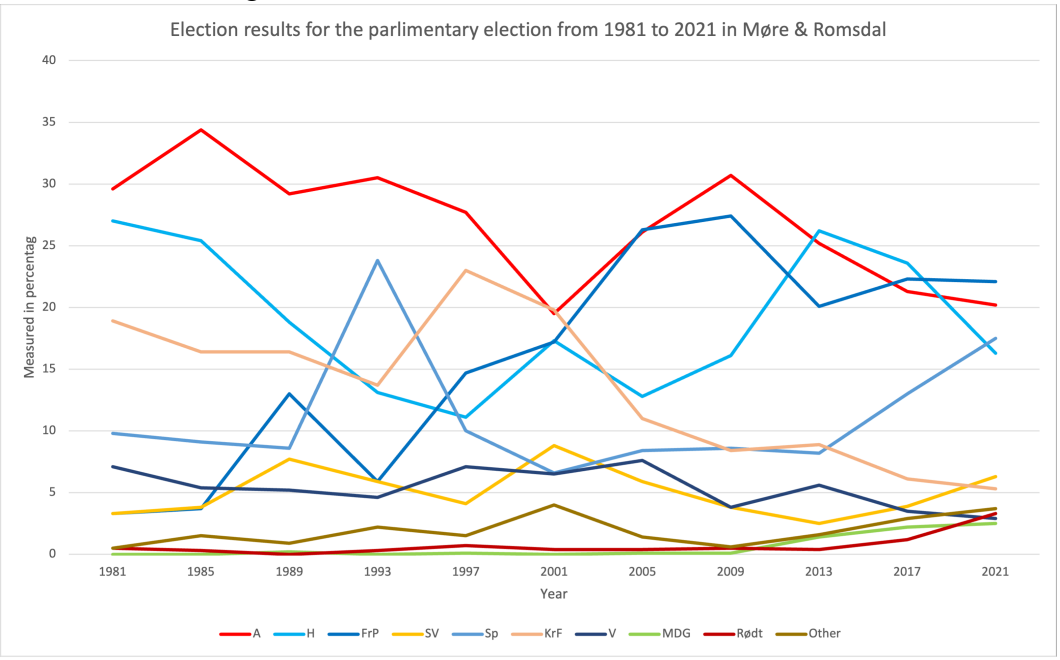
Note: Number of MPs from Møre and Romsdal elected from each party in each government period in Parliament. Timeline aligns with our dataset. Data from Stortinget.

Upon analysing the aggregate count of MPs elected from Møre and Romsdal, it becomes apparent that A has emerged as the dominant political force in the region, with H and KrF following suit. In a manner akin to Rogaland, MDG has failed to secure any elected MPs from the district in parliament. Nevertheless, the circumstances leading to this outcome may diverge from those observed in Rogaland, potentially arising from distinct local political factors.

Upon scrutinizing the period spanning from 1981 to 2001, it becomes evident that A, H, KrF, and FrP held prominent positions as the leading political entities in the region. However, notable voter preference shifts materialized in the 1993 election, wherein the SP experienced a significant surge in popularity.

Analysing the timeframe encompassing 2001 to 2021, we observe that A and FrP garnered considerable favour during the initial stages of this period, with the H solidifying its preposition as the unequivocal third most favoured party within the region. Nonetheless, a discernible trend emerges, indicating a surge in popularity for SP commencing in 2013 and persisting thereafter.

Figure 2: Election Results in Møre and Romsdal



Note: Shows elected political parties by number of MPs from Møre and Romsdal in Parliament.
Source: Stortinget (n.d).

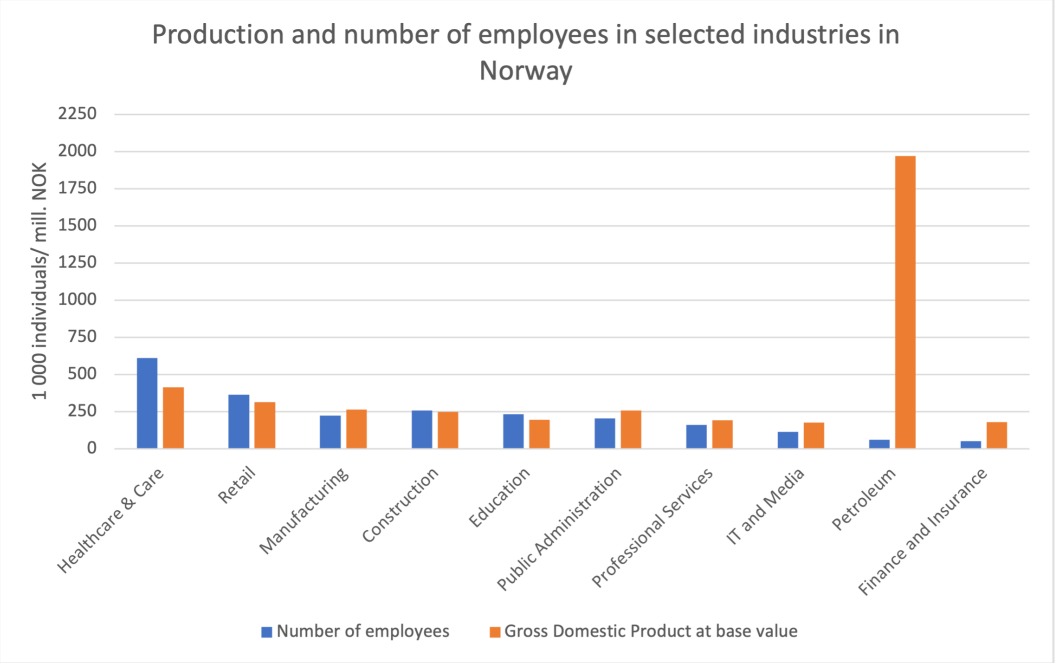
Overall, the data reveals that while fluctuations were evident among the major parties over the specified timeframe, A and H have consistently maintained their status as the predominant forces in the region, mirroring the findings from Rogaland. Additionally, akin to the observations in Rogaland, MDG has witnessed a notable upswing in its traction since the 2013 election.

4. Economic Structure

4.1 Norway

To assess Norway's economic structure, we study employment figures across major sectors and their corresponding gross domestic product at base value. This approach allows for an evaluation of the value creation within the economy, which is derived from the difference between the value of goods and services produced and the costs associated with their production. By examining these factors, we aim to outline the importance of certain sectors within the Norwegian economy.

Figure 3: Production and Employment - Norway



Note: Shows production value at base value in million NOK and employment in each sector in Norway. Source: SSB (2020).

In the realm of employment, the healthcare sector emerges as the most substantial, closely followed by the retail sector. However, an examination of the corresponding production value reveals a notable disparity, indicating that everyone employed within the healthcare sector generates a relatively lower production value compared to the costs associated with delivering the service. Essentially, this suggests that the sector efficiency in terms of employment and production value is relatively diminished.

In contrast, an evaluation of the petroleum sector reveals a contrasting scenario. De-

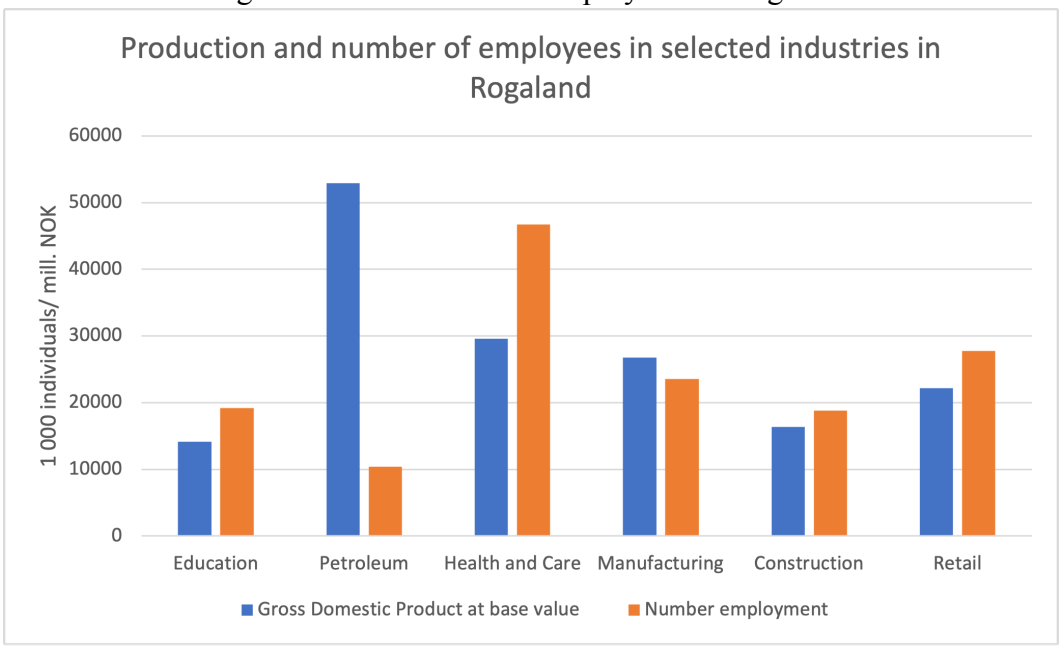
spite the petroleum sector exhibiting significantly lower employment figures than the aforementioned sectors, it generates a considerably higher production value relative to the number of employees within the sector. This observation underscores the sectors' ability to yield substantial economic output with fewer individuals employed, thus indicating a higher degree of efficiency in terms of employment and production value.

These findings highlight the importance of not solely relying on employment figures to assess the economic impact of a sector. While employment is a crucial indicator of labour market participation, considering production value provides a more overall perspective on the sector's contribution to the overall economy. By examining both employment and production value we see that the petroleum sector is an important sector for the Norwegian economy.

4.2 Rogaland

Understanding the importance of the industry in Rogaland is important for our thesis, which aims to analyse the consequences of economic structure on legislative debates. Rogaland has developed its prosperity through solid management of natural resources. In addition, the county's geographical location is of great importance for its overall competitiveness and for reaching markets in other countries. Rogaland has the second-highest value creation in the country, after Oslo (Forskningsrådet, 2021). Since the development of the petroleum industry gained momentum from the mid 1970s, Rogaland has been the central county for anything related to fossil energy. The oil and gas industry accounts for nearly a quarter of all value creation in the county. Of all Norwegian jobs related to fossil energy, 33% were performed by employees in Rogaland in 2018 (Forskningsrådet, 2021).

Figure 4: Production and Employment - Rogaland



Note: Shows production value at base value in million NOK and employment in each sector in Rogaland. Source: SSB (2020).

The results depicted in figure 4, focusing specifically on employment and production value within Rogaland, mirror the findings observed in the broader context of the Norwegian economy. Notably, the petroleum sector in Rogaland exhibits a similar effect as it does in the overall Norwegian economy.

In Rogaland, as in Norway as a whole, the petroleum sector displays a distinct pattern. Despite featuring lower employment figures compared to other sectors, the petroleum sector generates a significantly higher production value relative to the number of individuals employed within the sector. This suggests that the petroleum industry in Rogaland, much like the national economy, demonstrates a higher level of efficiency in terms of employment and production value.

By drawing parallels between the findings in Rogaland and the overall Norwegian economy, it becomes evident that the petroleum sector plays a vital role in driving economic output and productivity within the region. These consistent patterns across both scales underscore the significance of the petroleum industry in shaping the economic structure of Rogaland, contributing to its overall employment levels and production value.

4.3 Møre and Romsdal

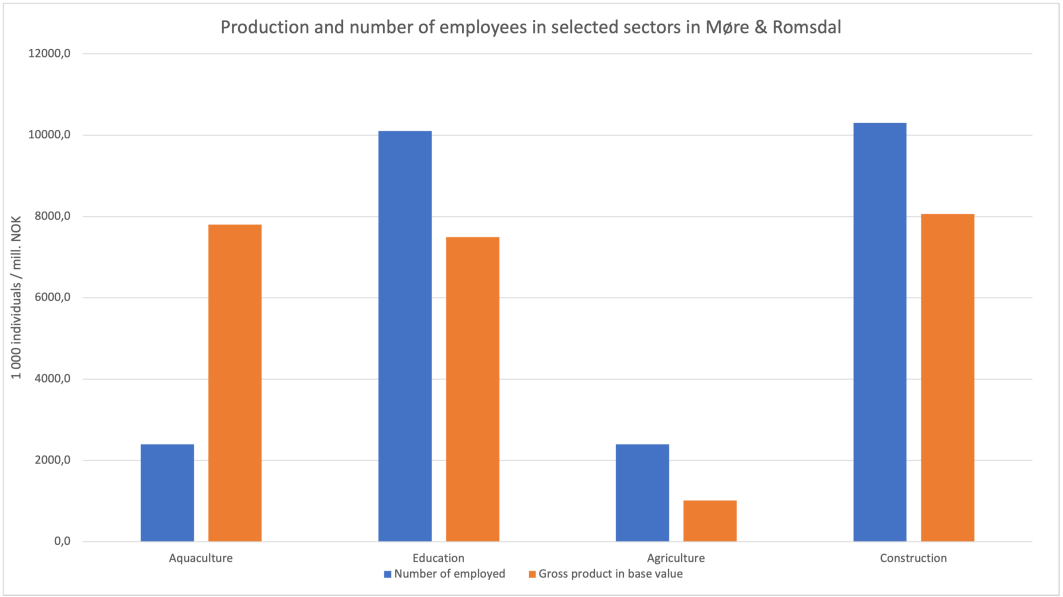
Møre and Romsdal is the largest fishing county in Norway. In 2016, seafood exports from this county amounted to 16.9 billion NOK, which accounted for 22% of the total seafood exports from Norway (SSB, 2023c). The EU is the largest market, and favourable trade agreements through EEA are crucial for value creation and continued growth.

Møre and Romsdal is also a national focal point in the rapidly growing aquaculture sector (SSB, 2023a). This is why we use Møre and Romsdal as a comparative object to examine whether MPs from the same district will behave similarly to MPs from Rogaland based on the county´s economic structure. The emphasis on the significance of the fishing and aquaculture industries in Møre and Romsdal underscores the importance of examining how regional economic characteristics may influence the political engagement of MPs. By comparing MPs from these two regions, we can gain insight into whether there are similarities or divergences in their policy stances, particularly in relation to issues related to the fishing industry and aquaculture.

Upon evaluating the local economic structure of Møre and Romsdal, it becomes evident that the aquaculture sector within the region exhibits a remarkable level of productivity, akin to the petroleum sector in Rogaland. While sectors such as education and construction demonstrate higher employment figures, it is noteworthy that the aquaculture sector outperforms them in terms of value creation.

The discernible high level of value creation observed in the aquaculture sector serves as a compelling rationale for selecting Møre and Romsdal as a suitable counterpart for assessing the impact of local economic structure on parliamentary debates. This choice is reinforced by the fact that aquaculture, being a natural resource, shares similarities with the petroleum industry, further underlining its suitability for comparison.

Figure 5: Production and Employment - Møre and Romsdal



Note: Shows production value at base value in million NOK and employment in each sector in Møre and Romsdal. Source: SSB (2020)

5. Data

5.1 Sikt Survey Data

In our study, we utilized survey data from Sikt to construct our supplementary data set, the survey included a total of 11,203 respondents, providing a rich set of variables that captures various aspects such as demographic background, electoral district, age, occupation, political views, health, and lifestyle, among others (Sikt, n.d.). The inclusion of these variables allows for customization of the data set based on our research preferences and objectives.

Incorporating the Sikt survey data into our thesis enables us to investigate the extent to which voters' concerns are reflected in the parliamentary speeches of MPs. by utilizing this survey data, we can assess the alignment between issues that matter to the electorate and the topics addressed by MPs in their parliamentary speeches. This approach offers insight into the responsiveness of MPs to the concerns of the voters and allows us to analyse the degree of representation in parliamentary speeches.

The dataset employed in our study is derived from the Norwegian Citizen Panel 2020 ("Norsk medborgerpanel 2020") survey, which was conducted by the University of Bergen. It is important to note that the survey undergoes slight modifications each year, leading to changes in the included questions. Consequently, our analysis does not capture longitudinal developments within specific questions. Nonetheless, the survey questions we present in this study pertain to the last election held in 2021, ensuring their relevance to our research questions.

5.2 Parliament Speech

Our research involved the utilization of an existing dataset shared with us by our supervisors (Fiva et al., 2023). This data set consisted of legislative floor speeches from the Norwegian Parliament in the period 1981 to 2021 and forms the primary basis for our analysis. The data consist of texts of speech data (N = 270,746) with associated data to each speech, such as speakers name, date, political party, gender, birth year and more.

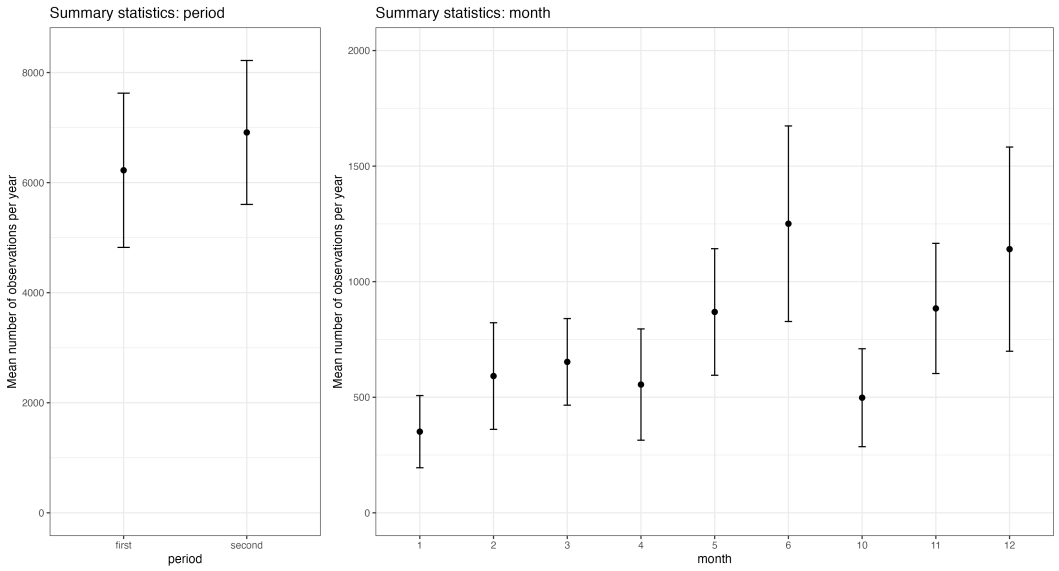
This is an already cleaned subset of their original data set (N = 588,006), where certain observations are dropped from the original data set. Some of the observations removed are speeches by presidents and vice presidents of the Parliament (178,829 observations), cabinet members (92,214), and deputy MPs (12,742). In their study on Group identities, they also removed observations in Nynorsk, MPs from the Centre Party (Sp), as well as

party-independent MPs and MPs from minor parties (Fiva et al. (2023). We decided to include Nynorsk speakers and Sp representatives in our research, because we believed it would contribute to our research question as Nynorsk is more commonly used in certain regions of Norway. We also considered it to fit our methodology as our model should recognize relevant words in both languages. We also included Sp, and minor parties. Finally, we removed observations in the summer months, where parliament is closed, and removed empty documents, which resulted in a final dataset of N = 269,040 observations.

To expand on the data compiled by Fiva et al. (2023), we enriched our dataset with two new variables. The first was 'gov', a dummy variable that indicates whether a speaker's party is in government at the time of the speech. Government data was collected from the Norwegian government (Regjeringen, n.d.). and was incorporated to provide additional context to our analysis and add a political power dimension in our research. The second was a 'district' variable that represents which electoral district a speaker represents. With this data we were able to capture differences between electoral districts in Norway, which is fundamental for our research. We gathered data on representatives from Stortinget (Stortinget Åpne Data, n.d.) and matched representatives' names in our dataset with their home electoral district.

Inspecting our dataset of 269,040 observations, we find some interesting statistics. All plots are showing the average number of yearly speeches, by each group, with the lines representing the one standard deviation away from the yearly mean. Firstly, speeches are very slightly increasing in frequency for each year, and there are approx. 700 more speeches per year in the second half of our sample than the first. The speech data is also affected by seasonal patterns, where the Parliament has no meetings in July, August and September. We can also note the increased activity before summer and before Christmas.

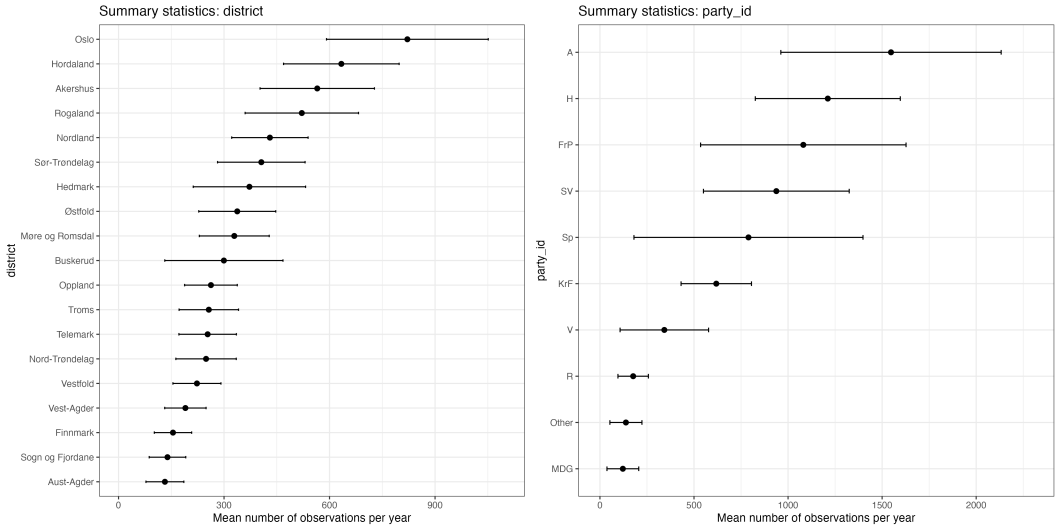
Figure 6: Summary Statistics - Time Period and Months



Note: Figures illustrate the mean number of speeches per year on the y-axis. On the plot to the left, the x-axis we show periods, defined as the first and second half of our dataset. Figure to the right shows average number of speeches delivered per month. Note the gap between June and October, where parliament is closed.

Looking at electoral districts, Oslo is the most represented in Parliament. Followed by Hordaland, Akershus and Rogaland. When it comes to parties, A is the most prominent speaker, followed by H, FrP and then SV and Sp. These observations are consistent with the number of representatives these parties have had in parliament in the last two decades (Stortinget, n.d.).

Figure 7: Summary Statistics - District and Party

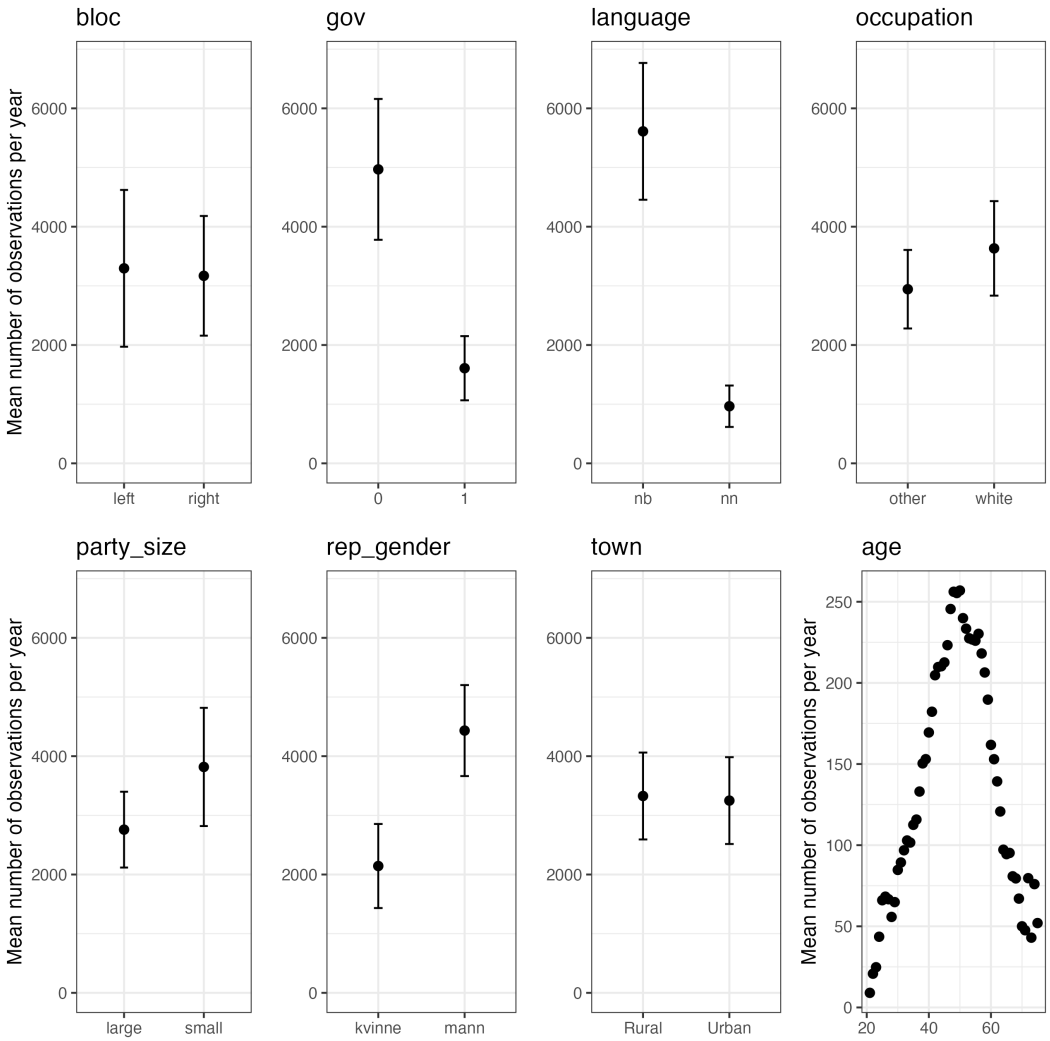


Note: Figure to the left shows districts on the y-axis and the mean number of speeches per district on the x-axis. Figure to the right shows political party on the y-axis and the mean number of speeches per political party on the x-axis.

Considering the backgrounds of MPs, we can see that the data can be considered representative for the country. On a bloc/ideology dimension, our sample is evenly split between left (R, SV, A, Sp) and right (KrF, V, H, FrP) (Nedregård, 2023), with the centre having fewer observations. Norway's two largest parties, A and H, are comparable in number of observations to the remaining parties. 14% of speeches are categorized as Nynorsk, consistent with the number of Nynorsk users (Foss, 2022), whereas the rest are in Bokmål. In an urbanicity dimension, half of the sample (50.58%) are from a rural background and the remaining half are from urban areas categorized as towns. Occupation, defined as if an MP's father held a white-collar occupation (Fiva et al., 2023), is also evenly split between white-collar and others. Out of all observations, only a third (32.58%) are women, supporting the notion that women are underrepresented in Parliament. Finally, we can see in the age plot that the most observations are from people aged 40 to 60.

Having presented our data sources, it is now time to pre-process our speech data to prepare for the creation of our Structural Topic Model.

Figure 8: Summary Statistics - MP Background Characteristics



Note: MPs background characteristics. This includes ideology, government, opposition, language, occupation, political party size, gender, town and age.

5.3 Pre-Processing of Data

The pre-processing of text data represents a foundational step in the overall methodology of text analysis (Roberts et al., 2014). Its primary function is to improve on computational power by removing non-necessary and simplifies the text data without losing essential information, thereby allowing our analytical models to focus on the crucial elements of the text. Political speech includes a lot of formalities and common words and phrases such as: 'response', 'question' and 'thank you', which do not contribute to our analysis. In essence, pre-processing sets the stage for the effective application of our Structural Topic Modelling and sentiment analysis techniques, and as such, is indispensable to our study.

To process our data and conduct our research, we employed R and R Studio, with an assortment of R packages. These included 'haven', 'readxl', 'readr' for data input, 'quanteda', 'SnowballC' and 'tm' for text analysis, 'ggplot2' for data visualization, 'dplyr', 'lubridate', 'broom', 'tidytext' and 'forcats' for data manipulation 'fixest' for regression, 'tidyverse' for a collection of R packages designed for data science, and finally 'stm' for creating and studying the Structural Topic Model.

The first step in preparation for pre-processing our text data, was to compile a list of stop words, which are words that do not provide significant value to the identification of topics and are therefore removed from the dataset. This list was initially based on a standard Norwegian stop words list from the Natural Language Toolkit (Bird et al., 2009) but was customized by adding additional words that were identified as non-informative in the context of our data. These non-informative words were selected from often occurring high probability words in the first versions of Structural Topic Models we created.

The next step was to create a corpus, which is essentially a structured set of texts (Cambridge Dictionary, n.d.) – in this case, the transcriptions of the parliament speeches with attached metadata. The corpus was pre-processed by converting the text to lowercase, removing punctuation and numbers, eliminating stop words, and stemming words to their root form. Unlike Fiva et al. (2023), we decided to use stemming instead of lemmatization. This is because our research aims to study topics and not to explore nuances in the language. We also contemplated the creation of important bigrams, pairs of words that occur together frequently and hold special meaning, e.g., 'Kristelig Folkeparti' but decided against it because of the scope and time limitations of this thesis.

The next step was to create a Document Feature Matrix (DFM) from our corpus. The DFM is a quantitative representation of the occurrence of words in each document or speech and is vital for the Structural Topic Model (Benoit et al., 2018). Following this, the metadata was attached to this matrix. With the DFM ready, everything was in place to create our STM.

This rigorous process of data preparation and enrichment ensured our dataset was both comprehensive and suitable for the nuanced exploration of our research question using Structural Topic Modelling and sentiment analysis. More information on the model and its development can be found in the upcoming methodology chapter.

6. Methodology

Having looked at our data, it is now time to move on to our methodology, where we will present our empirical strategy, the Structural Topic Model and its topics, and explain sentiment analysis.

6.1 Empirical Strategy

Our empirical strategy employs a fixed-effects model to analyse the impact of a politician representing a specific electoral district (D_d), Rogaland, on the share of speeches ($\theta^v_{d,p,t}$) devoted to each topic (v). The model specification is as follows:

$$\theta^v_{d,p,t} = \beta^v D_d + \gamma_p + \pi_t + \epsilon^v_{d,p,t} \tag{6.1}$$

Here, $\theta^v_{d,p,t}$ represents the proportion of speech that topic v represents in year t for party p from district d. D_d is a binary variable equal to 1 if the district is Rogaland and 0 otherwise. γ_p and π_t represent the fixed effects for political party and year, respectively. Our unit of analysis is the mean topic proportion by district, and not on individual levels.

Our parameter of interest is β^v, which measures the effect of being a politician from Rogaland on the proportion of speeches devoted to each topic. The fixed effects γ_p and π_t control for unobserved time-invariant characteristics specific to each political party and each year that may affect the topic proportions, allowing us to isolate the effect of the electoral district. Our hypothesis for the results is that politicians from Rogaland are more likely to engage in topics related to their main industry, petroleum, e.g., energy and environmental issues.

We implement our analysis using the Structural Topic Model (STM) approach to obtain topic proportions from parliamentary speeches. STM is a particularly useful method in our context as it allows us to consider document-level covariates that may affect both the topical content and prevalence in our corpus of speeches (Roberts et al., 2014). The theta values θ, an output of the STM, were particularly useful for our subsequent analysis. Each theta value denotes the prevalence of a topic in a specific speech, providing an estimate of the proportion of the speech that pertains to that topic. Employing these topic prevalence values was an efficient way to adjust for variations in the number of speeches and focus on the content.

Given our treatment is defined at the district level, we cluster our standard errors at this level to account for potential within-district correlation. While we recognize that clustering by the relatively small number of electoral districts (19) might give downwards biased

standard errors, but we have a large number of observations per cluster so $\hat{\beta}^v$ should be a good estimator for β^v (Colin Cameron & Miller, 2015). For robustness, we will also provide non-clustered standard errors and two-way clustered standard errors by district and political party.

We will also apply the same empirical strategy as in (6.1) to our sentiment scores, therefore using $y^v_{d,p,t}$, the weighted sentiment score, as the dependent variable. The

$$y^v_{d,p,t} = \beta^v D_d + \gamma_p + \pi_t + \epsilon^v_{d,p,t} \tag{6.2}$$

In the results chapter, we will present both graphical and tabular representation of our findings to elucidate the variation in topic prevalence across districts.

6.2 Structural Topic Model

To explore the research question, "How does local natural resources dependence shape legislators' coverage of environmental topics?", we employ Structural Topic Modelling (STM). STM is a generative model for corpora, allowing the incorporation of document metadata into the estimation of topics and their prevalence (Roberts et al., 2014). This means that STM does not only discover topics in the corpus, but also examines the relationship between these topics and document-level covariates, which aligns with our research objectives.

STM works on the principle of "bag of words", implying that the document is treated as an unordered set of words. The main idea is that documents are represented as a mixture of topics, where each topic is characterized by a distribution over a fixed vocabulary (Roberts et al., 2014). In the context of our research, topics would relate to different thematic areas discussed in the political speech. STM is a mixed-membership model, where each document is considered a mixture of topics, with each word within a document belonging to exactly one topic. This means each document is represented as a vector denoting what fraction of its words belong to each topic (Roberts et al., 2014).

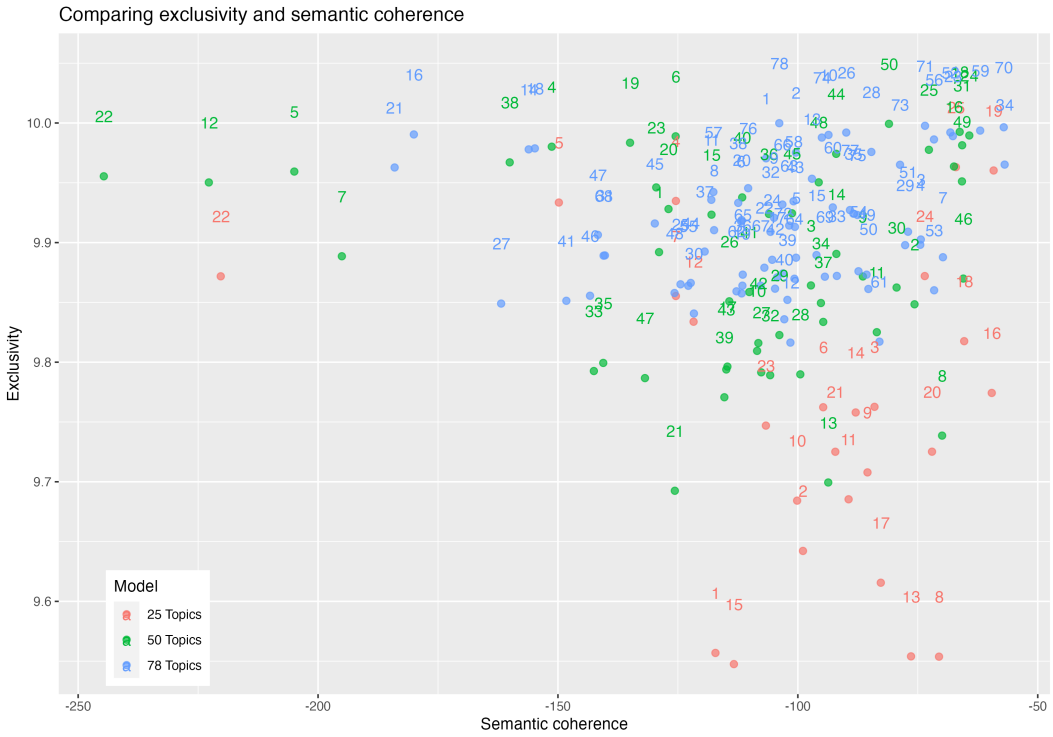
In our study, we used STM to analyse speeches from the Norwegian parliament. By utilizing STM, we could discover underlying topics in the speeches while considering the influence of the metadata. STM is particularly suited to our research as it allows for a more nuanced exploration of our data. Rather than viewing each speech in isolation, STM allows us to see how the topics of speeches are influenced by their metadata. This approach is highly compatible with our research question, as it provides a direct way to model this relationship.

Model Development

With our processed data, corpus, and document feature matrix (DFM), we were almost ready to create our STM. But, to achieve the best possible results, we used two different methods for selecting how many topics the model should have. When deciding the number of topics, there is a trade-off between semantic coherence and exclusivity among topics. Semantic Coherence can be understood as a measure of the quality of each topic (Mimno et al., 2011)

and exclusivity can be interpreted as the (lack-of) overlap between topics (Roberts et al., 2014), i.e., a score of how unique each topic is. The first approach to decide on the number of topics was a built-in algorithm suggested by Lee & Mimno (2014) to automatically set the number of topics. This algorithm suggested 78 topics for our working model. During our work on this project, we have also studied other models with a lower number of topics. The second method was testing the quality of the various models, we got the results shown in figure 9. As it shows, the 78-topic model has the most topics in the upper right quadrant, where topics score high in both exclusivity and semantic coherence, and there were more outliers of negative topic quality in the models with a lower number of topics. We experienced that to answer our research question, a model with a high number of topics also performed better in getting coherent environmental topics.

Figure 9: Topic Quality for Different Models



Note: Shows the topic quality for each topic in; a 25 topic model, a 50 topic model and the final 78 topic model. Results in the upper right quadrant are preferred, as they represent both high exclusivity and semantic coherence.

The STM was then ready for execution, providing a range of visual and textual summaries of topic information, such as topic prevalence, highest probability words, and FREX words, i.e., words that are both frequent in and exclusive to a topic (Bischof & Airoldi, 2012).

Topics

With a completed 78 topic STM we were ready for analysis. As mentioned before, we found that a higher number of topics gave us more informative topics to study, but it also makes it harder to study the full model. For the efficient analysis of our topics, we therefore created subsets of selected topics for further analysis. Because of the way we structured the model,

we can easily extract or exclude relevant variables or topics in future research.

To select relevant topics we used two approaches, a dictionary-based approach and visual inspection. The dictionary approach based itself on a list of selected words relevant for our research [1], and each topic that had one (or more) of these words in its top 20 most likely words would be relevant for further analysis. This approach yielded four topics, which we chose to study further. These four topics are 4, 19, 24 and 62, and to assist the analysis we chose to name them “Emissions”, “Environmental Protection”, “Aquaculture”, and “Energy”, respectively. Additionally, there was a manual inspection, where we handpicked the most relevant topics based on high probability words and FREX-words. Using this approach, we confirmed the four topics above were relevant and we added topic 49: Petroleum, because of its environmental consequences and its importance to both the Norwegian economy and Rogaland’s local economy. All five of these topics also score highly in the exclusivity-coherence measures. An overview of these in total five topics, with the highest probability and FREX words are listed here in table 5, and the most representative speech in each topic can be found in table 6.

Moving forward with these five topics, Aquaculture, Emissions, Energy, Environmental Protection and Petroleum, we have five environmental topics that we will use in our analysis. The topics appear well-defined and cover important aspects of environmental issues. One weakness in the topic creation that we have identified, is the inclusion of the word “left” in the emissions topic. The word “left” is both the Norwegian name of a political party, V, and it could also be used to separate parties along the political axis, something we must consider when analysing the topic.

Table 4: Summary Statistics - Topics

	Aquaculture	Emissions	Energy	Environmental Protection	Petroleum
Min.	0.0000089	0.0000007	0.0000004	0.0000021	0.0000021
1st Qu.	0.0003765	0.0004558	0.0002497	0.0002263	0.0002071
Median	0.0008429	0.0013063	0.0006264	0.0005989	0.0005014
Mean	0.0084635	0.0106249	0.0091757	0.0075111	0.0062147
3rd Qu.	0.0021155	0.0037330	0.0015944	0.0016021	0.0012516
Max.	0.8221373	0.8566089	0.9004986	0.8924127	0.8191399

Summary Statistics for theta values for each topic within the entire dataset.

The aforementioned theta values for each topic in each speech gave us quantitative data to study, which gave us the opportunity to use well-developed methods of econometric analysis, for example regression analysis, which is a tool used to discern relationships between the selected topics and different variables. In our analysis we decided to use mean theta values as our main variable of interest. We also considered using median values, but because of the high number of close-to-zero observations, it was less informative than mean.

[1] Dictionary: ”climate”, ”emissions”, ”pollution”, ”sustainability”, ”conservation”, ”biodiversity”, ”deforestation”, ”recycling”, ”renewable”, ”ecosystem”, ”global warming”, ”carbon”, ”greenhouse”, ”species”, ”waste”, ”habitat”, ”ozone”, ”energy”, ”wildlife”, ”ocean” (Translated with Google Translate)

We employed linear regression to determine the relationship between the topic prevalence and the local economic structures. The details of which were presented in our empirical strategy.

Table 5: Environmental Topics - High Probability and FREX Words

Topic	Highest Prob	FREX
Aquaculture	industry, fish, fishing industry, coast, fisheries minister, quota, fishery, long, fisher, vessel	fishing industry, raw fish, fisheries policy, sales team, coastal fishing fleet, fishery dependency, raw fish team, condemnation scheme, fleet group, quota notification
Emissions	left, emissions, green, measures, goals, reduce, pst, climate policy, value, use	environmental party, biofuel, climate goals, climate panel, emission cuts, carbon, biogas, carbon capture, palm oil, Paris Agreement
Energy	energy, industry, power, gas power plant, use, renew, gas, new, land, hydropower	hydropower, energy source, wind power, state grid, power market, small power plants, co2 purification, coal power, district heating, northconnect
Environmental Protection	minister of environmental protection, accident, pollution, long, boat, coast, damage, waste, environment, father	wild salmon, radioactive, landfill, loran, loading station, natural damage, sellafield, førdefjord, life jacket, salmon strain
Petroleum	statoil, development, shelf, oil, oil, gas, field, oil company, company, oil company	haltenbank, oil environment, Heidrun, operator responsibility, degree of recovery, field development, oil policy, Svea, Snorre field, Statfjord

Note: Highest probability and FREX words within the selected topics. Terms are translated from Norwegian to English using Google Translate.

6.2.1 Sentiment Analysis

In addition to the Structural Topic Modelling (STM), we integrated sentiment analysis into our research methodology for a more nuanced understanding of the selected topics within the speeches. Sentiment analysis, sometimes referred to as opinion mining, is a branch of natural language processing that identifies and extracts subjective information from a given text (Medhat et al., 2014). Applied to our research, this technique enabled us to discern the underlying attitudes, opinions, and emotions expressed in the legislative speeches regarding selected topics from the STM. We concentrated our sentiment analysis on a set of topics that were particularly pertinent to our research question, as mentioned above.

The first step was to extract the relevant data from the already-made Structural Topic Model. Therefore, we created a new dataset with each speech as a row and kept the relevant metadata, as well as the topic proportions for each of the 78 topics, for each speech. For simplicity, we decided to assign each speech with the topic with the highest topic proportion. This means that each speech in our data gets assigned a main topic, which together with the related topic proportion gives us more accessible data to analyse.

For the sentiment analysis, we employed a dictionary-based approach using the NorSentLex positive/negative dictionaries (Barnes et al., 2019). These dictionaries contain lists of words that have been pre-classified as conveying positive or negative sentiment, providing a foundation for assigning sentiment scores to our text data. We can note that the negative dictionary (N = 14,839) is over twice the length of the positive (N = 6,103), which can skew our sentiment scores negatively.

The sentiment analysis began by extracting the text associated with our selected topics from the STM. This text was then tokenized into individual words or 'tokens.' Each of these tokens was subsequently assigned a sentiment score, either positive, zero, or negative, based on its presence in the NorSentLex positive or negative dictionaries. With the sentiment score for each speech, we decided to weight the sentiment score for each speech based on the maximal theta value, i.e., how much of the speech was attributed to the main topic. We do this to get a more representative view of speech behaviour.

The sentiment scores offered an additional layer of insight into the speeches. By averaging these scores, we obtained an overall sentiment score for each speech, which indicated the general tone and emotional content of the speeches concerning the selected topics. This provided a more profound understanding of the legislators' stance on the chosen topics and enabled us to scrutinize if and how the sentiment towards these topics varied across different local economic structures or over time.

Table 6: Most Representative Speech and Sentiment Scores

Topic	**Most Representative Speech**
Aquaculture	”I would like to ask the minister the following question: ’The distribution of the pilot quota has affected the coastal fleet and boats in the trawler fleet under 90 feet. What will the minister do to rectify this lopsided distribution?”’
Sentiment Score: $+3-2=1$ | Weighted Sentiment: 0.8221	
Emissions	”The Liberals and the government agree that we need a green shift, and there is agreement in the Storting on an ambitious climate policy. We have 15 years to reach this target in 2030. All sectors must contribute for us to reach the target, and some must contribute more than others. What proportion of the emission reduction will the government propose that the transport sector take, and what will be the most effective measures?”
Sentiment Score: $+3-4=-1$ | Weighted Sentiment Score: -0.8567	
Energy	”Hafslund will build a pellet factory on Averøy and in that connection has the opportunity to build a facility that can supply reserve power to a region where power supply can be critical at times. Power generation based on pellets will be an alternative to highly polluting power generation from the purchased mobile gas power plants. How can the minister contribute to the investment in reserve power from pellets instead of mobile gas power plants?”
Sentiment Score: $+1-6=-5$ | Weighted Sentiment Score: -4.5025	
Environmental Protection	”I have the following questions for the Minister of Fisheries: ’In connection with the ”Rocknes” sinking, shallows were discovered in the Vatlestraumen, which is part of the narrowest and busiest part of the shipping route to and from Bergen harbour. Vatlestraumen has very dirty waters, with insufficient map documentation. Trafficking ships also include larger tonnage with dangerous, polluting cargo and large passenger ships with large bunker capacity. Will the minister introduce sailing restrictions in the Vatlestraumen?”’
Sentiment Score: $+3-8=-5$ | Weighted Sentiment Score: -4.4620	
Petroleum	”I allow myself to ask the following question to the Minister of Oil and Energy: ’In oil and economic circles, questions are being asked as to whether the overall level of development in the North Sea is too high in relation to the expected gas storage possibilities. In particular, questions are being asked as to whether it is right to develop Sleipner according to the anticipated pace plan. When will the Minister of Oil and Energy decide on this?”’
Sentiment Score: $+5-1=4$ | Weighted Sentiment Score: 3.2766	

Note: Shows the most representative speech for the selected topics and its sentiment scores (+ Positive Words - Negative Words), as well as the weighted sentiment score, which is the sentiment score multiplied by θ (Topic Proportion). Translated from Norwegian to English using Google Translate.

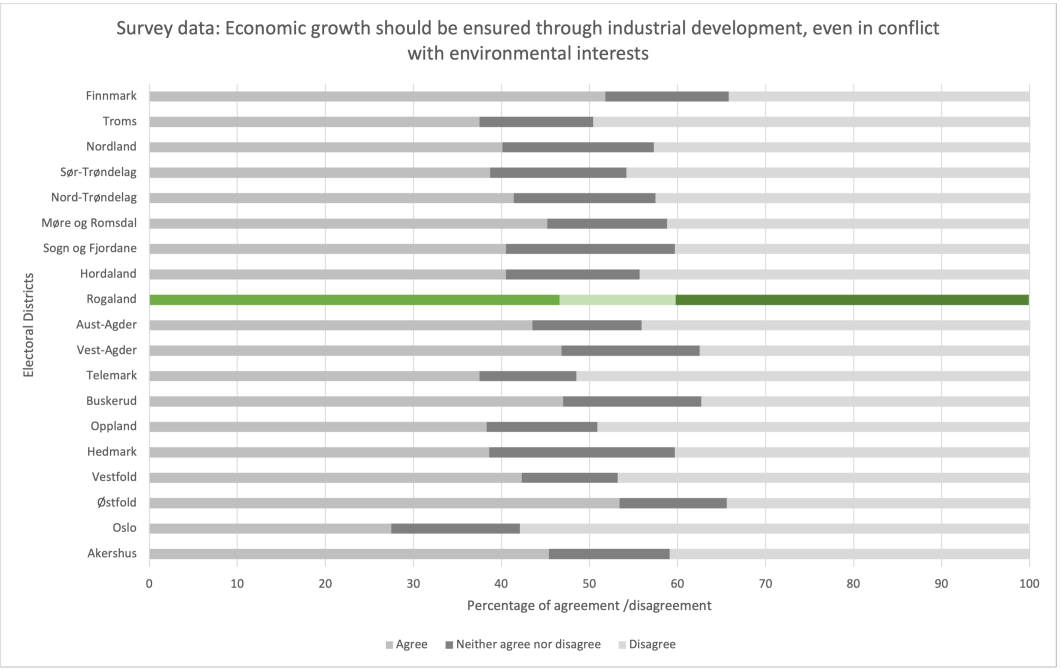
7. Results & Analysis

7.1 Voter Preference in Rogaland

Shifting our focus towards preference, our objective is to utilize survey data from Sikt to assess the extent to which the interests of citizens in Rogaland are represented by their elected MPs. To capture the complex trade-offs encountered by citizens in Rogaland between economic structure and environmental concerns, we have utilized two sets of questions that aim to reflect these considerations to the best of our ability.

The initial graph presented in this analysis explores whether citizens of Rogaland believe that economic growth should persist even in stances where it conflicts with environmental considerations. This graph serves as an illustrative visualization of the responses obtained from the survey participants (N=11203).

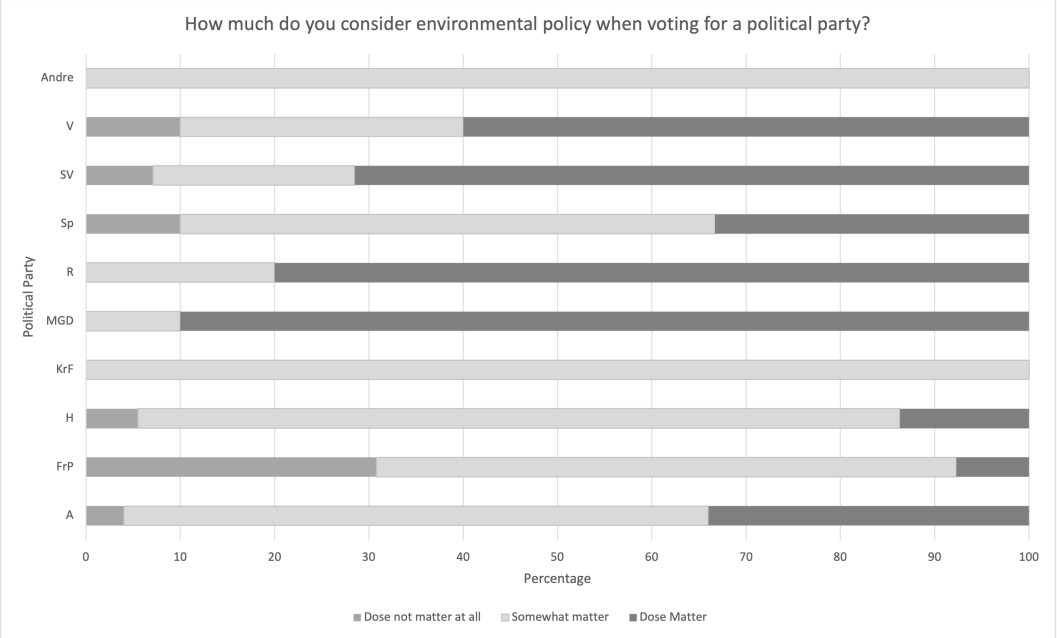
Figure 10: Survey Data: Economic Growth vs Environment



Note: Survey Data from Sikt (N=11203). Source: Sikt (n.d.).

Commencing our analysis, the graph displays all 19 electoral districts on the y-axis, while the x-axis represents the percentage of agreement or disagreement. Of particular interest is Rogaland, the district we are focusing on, which has been highlighted for emphasis. The findings reveal that approximately 45% of the survey participants from Rogaland agree with the given statement. In contrast, roughly 40% of respondent express disagreement, and

Figure 11: Survey Data: Environmental Policy



Note: Survey Data from Sikt (N=11203). Source: Survey data (n.d.).

around 15% neither agree nor disagree, indicating a neutral stance.

To provide a broader contextual understanding, it is noteworthy that the districts of Finnmark and Østfold exhibit significantly higher levels of agreement with the statement compared to Rogaland. Both districts surpass 50% threshold in terms of agreement, highlighting their relatively strong alignment with the notion expressed in the statement.

Additionally, a noteworthy observation is that the district of Oslo exhibits a substantial disagreement rate of nearly 60% with the statement, surpassing the disagreement expressed by Rogaland. This disparity between Oslo and Rogaland warrants further investigation when analysing the alignment of MPs from Rogaland compared to their counterparts within their respective parties. Therefore, when conducting an overarching analysis, it becomes evident that MPs from Oslo hold greater influence in environmental debates, as their larger representation facilitates more opportunities for speaking engagements. This, in turn, enables us to explore the extent to which political affiliation plays a more significant role compared to economic structure, by just looking at MPs from Oslo compared to MPs from Rogaland. Consequently, our analysis aims to ascertain whether a similar pattern emerges among the MPs, addressing the question of whether their viewpoints align in a comparable manner to that of their constituents.

In our subsequent analysis, we delve into the agreement or disagreement of citizens in Rogaland regarding the aforementioned statement, taking into consideration their voting preferences in the last parliamentary election. The question at hand explores the degree to which voters prioritize environmental policy when casting their votes. This inquiry aims to provide insight into the prevailing consensus among voters in Rogaland, accounting for their respective party affiliations.

As depicted in figure 10, the major parties exhibit a similar trend among their respective voters, indicating a moderate degree of concern for environmental policy when making voting decisions. This aligns with the overall outcome presented above. However, it is noteworthy that FrP demonstrates a majority of voters somewhat prioritize environmental concerns. This is reflective of the party's industrial policy, which places a significant emphasis on the petroleum industry.

When comparing A and H, a similar pattern emerges, wherein less than 10% of their respective voters prioritize environmental policy, while a majority of their voters display a degree of concern regarding environmental matters. Conversely, voters supporting MDG in Rogaland demonstrates a significantly higher level of concern for environmental policy, with an approximate 90% of their voters expressing such prioritization.

Nevertheless, when comparing these voter preferences with the composition of elected MPs, as shown in the preceding table, it becomes evident that MDG voters base represents a minority, as they lack representation in parliament from Rogaland. Notably, there is a distinct disparity between A and H. Approximately 34% of A voters prioritize environmental policy, whereas only 12% of H voters prioritize the same. This finding aligns with the earlier analysis, highlighting the majority representation of H MPs from Rogaland in parliament. Continuing our assessment of the coverage of environmental topics in parliament by Rogaland MPs, we will now introduce the economic structure, taking into consideration the prominent role of the petroleum sector. This combination is warranted as the petroleum sector constitutes a substantial component of the Norwegian economy. Given that Rogaland represents the region with the highest concentration of petroleum activity in Norway, it is pertinent to provide this contextual backdrop to address our research question effectively.

7.2 STM & Sentiment Results

This section presents the primary findings related to the coverage of environmental topics in parliament, with a focus on the differentiation of MP's coverage on environmental issues. Specifically, it explores how MPs from Rogaland address environmental topics considering their economic reliance on petroleum. The goal is to examine whether any disparities exist between MPs from Rogaland and their party colleagues. Finally, a comparison is drawn between MPs from Rogaland and those from Møre and Romsdal to assess whether economic structure influences environmental perspectives in regions beyond Rogaland.

To begin, an examination of the coverage of environmental topics in parliament is conducted by analysing the positions taken by various MPs from all 19 electoral districts. This involves examining parliamentary debates (speeches), to identify the key topics that distinguish each district´s approach to environmental issues.

Subsequently, the attention shifts to MPs representing Rogaland, a region heavily dependent on the petroleum sector, to ascertain how they address environmental topics and determine potential discrepancies compared to their party colleagues. Through an exploration of MPs' speeches, their stance on environmental matters is examined. This contextual

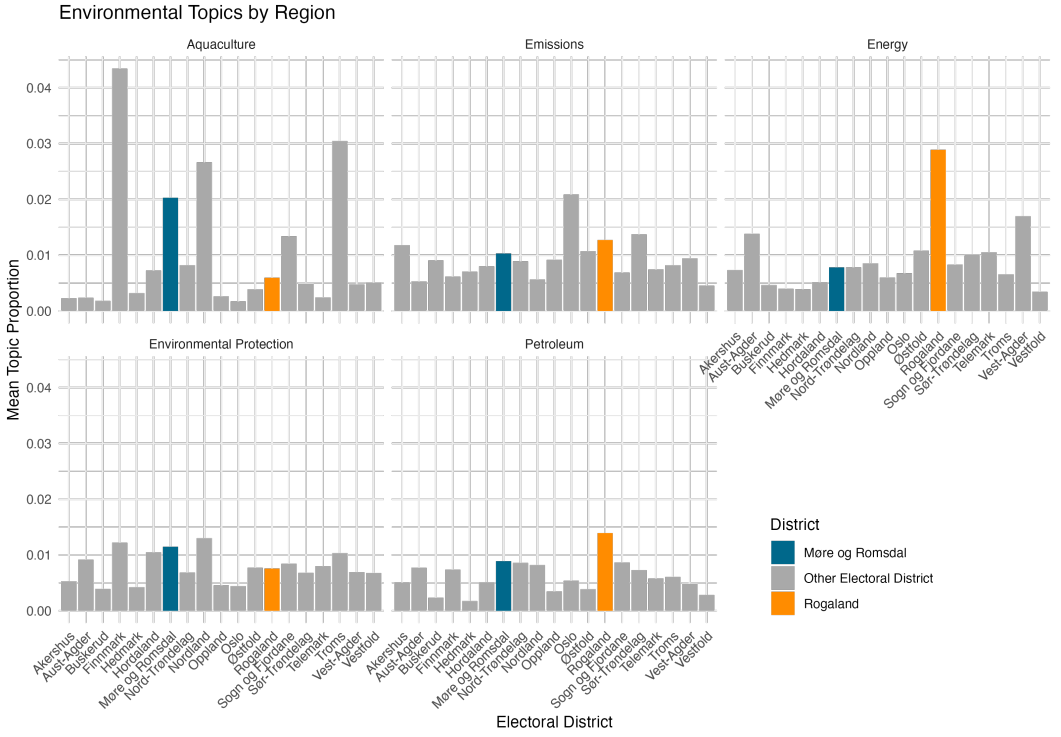
understanding aids in illuminating the local factors influencing MPs perspective on environmental topics.

In the final phase, an analysis is conducted between MPs from Rogaland and their counterparts from Møre and Romsdal. This inquiry seeks to determine whether the influence of economic structure extends beyond Rogaland and affects environmental perspectives in other regions. By following similar steps as outlined previously, including examination of speeches, the similarities and differences between MPs from Rogaland and MPs from Møre and Romsdal regarding environmental topics are assessed.

7.2.1 Environmental Coverage Among Electoral Districts

This section provides an overview of the environmental debates within the 19 electoral districts. By analysing the speeches delivered by MPs, we can understand the perspective of each district when it comes to environmental topics. The figure below illustrates the average proportion of discussions on environmental topics in different districts. Through our analysis of speech data, we quantify the level of attention dedicated to environmental topics by each district. The y-axis represents the mean topic proportion, which indicates the relative prominence of each topic within the MP´s environmental debates. The x-axis represents the 19 electoral districts in Norway.

Figure 12: Topic Proportions by Electoral District



Note: Shows electoral district on the x-axis and mean topic proportion the y-axis.

The presented figure depicts the categorization of environmental topics into five distinct categories, as previously discussed. Of particular interest is the examination of Rogaland, the chosen district for analysis. Within the energy and petroleum category, it is notable

that Rogaland´s MPs demonstrate a higher level of discourse compared to other districts. This result is in line with our hypothesis and can be attributed to the economic structure of Rogaland, characterized by its strong dependence on the petroleum sector. Consequently, discussions surrounding energy-related matters are more prominent among Rogaland´s MPs.

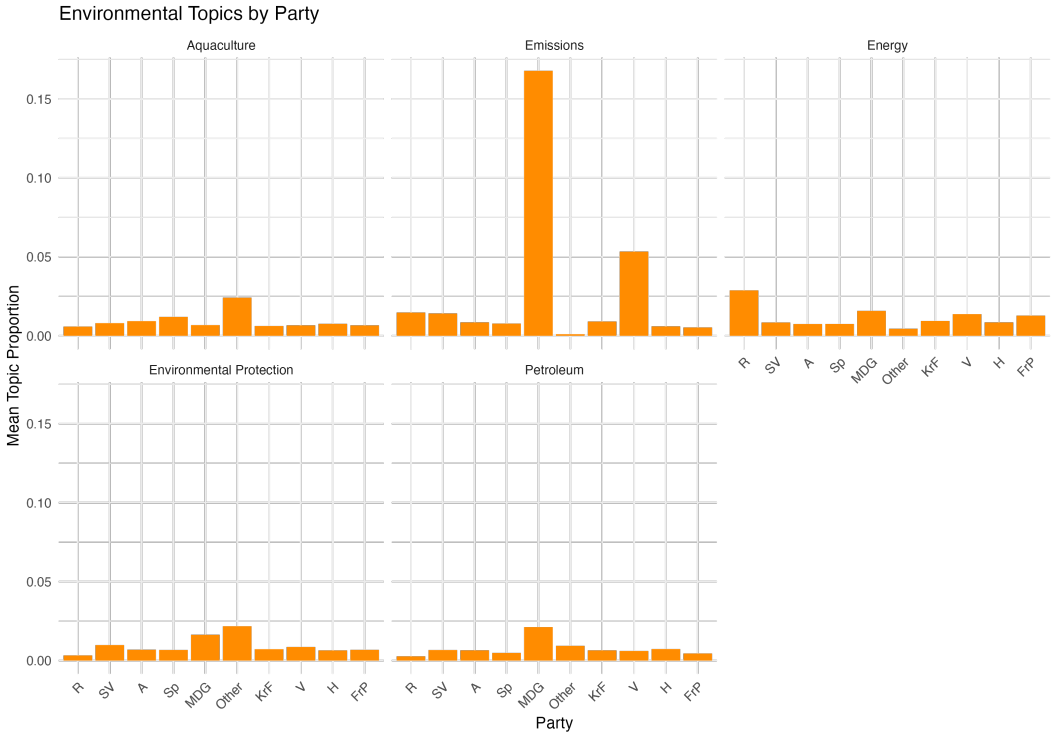
We can also note Rogaland MPs' low proportion of Aquaculture topics. Despite being a coastal region with a substantial fishing industry, the topic is less prominent in Rogaland than in other comparable districts. A possible explanation for this is the degree of economic dependence, and that because of Rogaland's unique position regarding petroleum, the fishing industry gets less attention. Another, surprising, result, is Rogaland MPs high attention to the emissions topic. This finding also builds on Finseraas et al. (2021), where our results show that Rogaland MPs don't shy away the subject and do in fact consider the environmental consequences of the petroleum industry.

When it comes to Møre and Romsdal, which we will analyse in more detail in part 3 of the results, we can see that they are close to the median in all topics, except for aquaculture. Given the economic structure in Møre and Romsdal, we expected them to score even higher in the aquaculture topic, but they are overtaken by other aquaculture-dependent districts: Finnmark, Troms and Nordland.

These findings are supported by our regression model, defined in (6.1). The relevant regression tables can be found in (Appendix A.1) Aquaculture (A.1.1) and Environmental Protection (A.1.4) have respectively negative and positive non-statistically significant coefficients, whereas Emissions (A.1.2), Energy (A.1.3) and Petroleum (A.1.5) all have positive, statistically significant coefficients. For emissions, the findings are only significant at a 1% level when controlling for party and/or year, whereas energy and petroleum are significant for all specifications of the model. The regression coefficients can be interpreted as the increased level of topic attention, given that the MP represents Rogaland. In other words, the average non-Rogaland MP uses 1.04% of their speech time on the emission topic, whereas the average Rogaland MP uses 1.40% of their speech time on the same topic, before controlling for year and party. The other coefficients can be interpreted similarly. This is a relatively low value, but the increase of 34.6% is significant, and considering all topics discussed in Parliament, even 1% can be seen as a substantial amount. These results are clustered at the treatment level, district, but the results are robust for not clustering and clustering at district-party level as well.

In addition to this analysis on electoral districts, we gained insight into the environmental discourse within Norwegian political parties on a national level. We will initially establish the overall consensus among these parties. This will provide a foundation for understanding which party places the greatest emphasis on environmental issues. Subsequently, we will narrow our focus to examine the MPs from Rogaland belonging to the same party. This analysis will enable us to identify potential patterns that indicate similarities or discrepancies in the environmental discourse between the broader party context and the specific Rogaland representative.

Figure 13: Topic Proportions by Party



Note: Shows Political party on the x-axis and mean topic proportion on the y-axis.

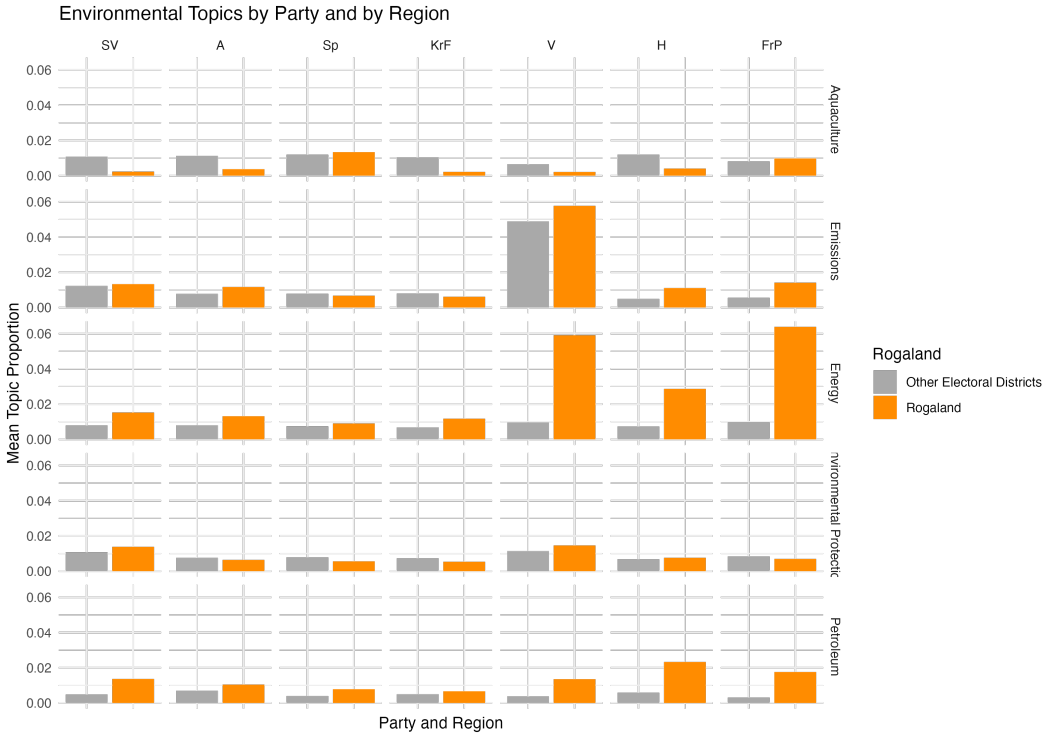
While an intimal examination suggests a general consistency across all parties, it is evident that MDG stands out prominently within the Emission category, as expected, and are the top speaker in all environmental topics except for energy, where R has the highest proportion. Notably V displays a much higher degree of involvement in emissions debates compared to other parties. This result may be influenced by the way our model inferred the topic, with ”left” being a high probability word, as mentioned in the methodology section. However, when considering the remaining five categories, there appears to be a similar trend among all parties, indicating a shared level of engagement in these areas.

Overall, the findings highlight Rogaland´s distinctive position concerning the energy and petroleum category, as its MPs demonstrates a notable emphasis on these topics. The interplay between Rogaland´s economic structure, characterized by a reliance on the petroleum sector, and the corresponding discourse on energy-related matters among MPs contribute to this distinctiveness. Rogaland MPs' attention to emissions is also notably high.

7.2.2 Environmental Coverage Among Rogaland MPs

Having established the environmental stance of each electoral district, it is of interest to investigate whether MPs from Rogaland align with the overall party consensus or hold distinct viewpoints. Specifically, our focus shifts to examine the coverage of MPs from Rogaland engaging in discussions on environmental topics in relation to the broader party stance. By considering coverage of these discussions and sentiment, we can gain insight into the degree of alignment or divergence between MPs from Rogaland and their respective parties.

Figure 14: Topic Proportions by District and Party



Note: Shows Political party and Region on the x-axis. And mean topic proportion on the y-axis.

The provided figure presents a distinction between political parties in Rogaland and those in other electoral districts. The "Other Districts" variable represents the national average mean proportions within each speech across the entire dataset, excluding Rogaland.

Starting with Aquaculture, we can see that Rogaland MPs consistently lie on a lower level than the average MP for each party, except for Sp and FrP. This suggests that Rogaland MPs downplay the importance of aquaculture compared to their party colleagues and supports our hypothesis that regional effects can dominate party effects. As seen in figure 12, there are some aquaculture-dependent districts that drive the national average.

When it comes to Emissions, one party stands out for all MPs, V. As mentioned earlier, our model might overemphasize the effect of V on Emissions, and we should not infer too much from this result. Looking at the other parties however, we can identify similar levels of attention at the topic from all MPs, but the right bloc and A in Rogaland seem to be at a slightly higher level than their mean colleague.

The same pattern emerges in the Energy topic, where we can see clear differences between the left bloc and the right bloc. Much of the increased attention to energy topics hail from the three parties on the right, and they are the drivers for Rogaland MPs' high topic proportions. This indicates that there are ideological effects to the energy debate, however we only see the effect in energy and petroleum. Interestingly, the two highest observations are V, an outspoken climate party, and FrP, an outspoken oil-positive party (Reed, 2021). The remaining parties also are positioned at a higher level than their non-Rogaland colleagues, which indicate that Rogaland MPs are incentivized to talk about energy topics compared to

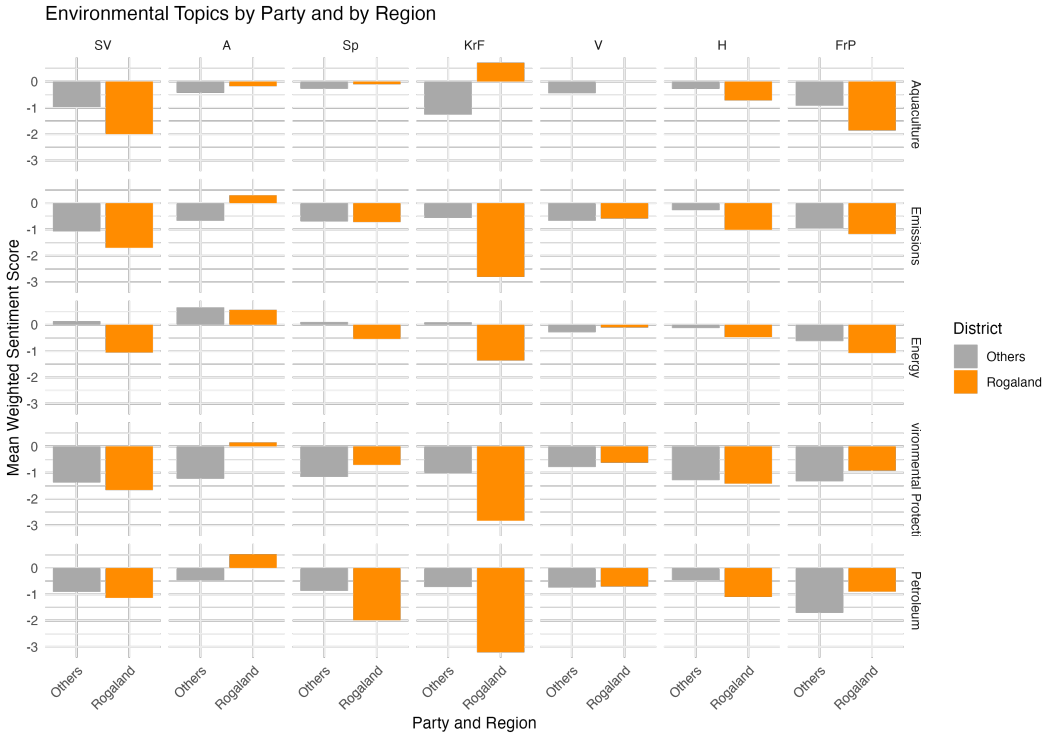
other MPs.

Moving on to Environmental Protection, Rogaland MPs and non-Rogaland MPs are at a similar level across all parties, with no major discrepancies.

Finally, we identify the same right bloc effects on the petroleum topic as observed in energy, but in lower magnitude.

Having established the heightened engagement of MPs from Rogaland in debates concerning energy, with particular attention to parties such as FrP and V, the subsequent step involved presenting the comprehensive findings pertaining to the sentiment expressed during discussions on these topics of interest. Employing sentiment offers a broader perspective of the discourse surrounding the topics, thus providing valuable insight into the prevailing attitudes inherent in such debates.

Figure 15: Weighted Sentiment Scores by District and Party



Note: Shows sentiment analysis of MPs from Rogaland compared to party colleagues.

Upon initial inspection of the graph, a notable pattern emerges whereby every category exhibits a negative sentiment score, except for Rogaland MPs from A who display a positive score when discussing four out of five topics. In contrast, A MPs at the national level express a negative sentiment score within this category, except within the energy category. This observation suggests that MPs from Rogaland tend to deviate from the overall party stance when engaging in discussions on petroleum, emission, and environmental protection topics. Focusing on the emission topic specifically, it becomes apparent that Rogaland MPs from FrP, KrF, SV, and H parties display more negativity compared to their party colleagues. Conversely, Rogaland MPs from V exhibit a lower degree of negativity within the same category.

In the aquaculture category, noticeable disparities in expressed sentiments become apparent. Specifically, the MPs from Rogaland belonging to FrP, SV, and H parties exhibit a higher degree of negativity compared to their party counterparts. The biggest party difference in sentiment is found in KrF, where Rogaland MPs have the only positive score, and their national party colleagues score negatively. This observation suggests a clear divergence between Rogaland MPs and their party colleagues concerning aquaculture.

Transitioning to the category of emissions, as previously mentioned, Rogaland MPs from A emerges as the sole proponents of a positive sentiment. Conversely, negativity pervades the entirety of this category. Notably, Rogaland MPs from KrF displays a distinctively higher level of negativity compared to their fellow party members. On the other hand, MPs from Rogaland from FrP, H, and SV exhibit a slightly greater degree of negativity compared to their party colleagues. A marginal disparity is observed within Sp and V parties concerning Rogaland MPs and their party counterparts.

Within the topic of energy, a noteworthy observation emerges regarding the sentiments expressed by A, which leans towards a positive stance on the topic by all MPs. Conversely, a prevalent negative pattern is discernible across all other political parties. Importantly, it becomes evident that Rogaland MPs, except for V, exhibit a higher degree of negativity compared to their party colleagues. This suggests a tendency among MPs from Rogaland to adopt a more pessimistic outlook when engaging in energy-related debates, relative to their counterparts within the same party.

In the context of the environmental protection topic, a similar pattern emerges, characterized by Rogaland MPs from A party being the sole group to express a slightly positive sentiment while their party colleagues adopt a negative stance of greater magnitude. Furthermore, it is noteworthy that Rogaland MPs affiliated with KrF party exhibit the highest degree of negativity among all groups of MPs. On the other hand, Rogaland MPs from H and SV parties demonstrate a higher level of negativity compared to their party counterparts. Conversely, Rogaland MPs from FrP, SP, and V parties exhibit less negativity relative to their respective party colleagues when discussing the environmental protection topic.

Turning to the petroleum category, a notable pattern emerges. Once again, Rogaland MPs from A stand out as the sole group expressing positive sentiments regarding this topic. Moreover, they maintain a positive stance in contrast to their party colleagues, who hold a negative view. It is worth highlighting that Rogaland MPs from KrF also exhibit a negative perspective in comparison to their party counterparts. This trend is similarly observed among Rogaland MPs from SV and H. However, when examining Rogaland MPs from FrP, SP, and V parties, an opposite pattern emerges, as they express less negativity relative to their party colleagues.

In summary, this analysis highlights distinctive patterns in the environmental discourse among political parties in Rogaland compared to the national average. The regional economic structure, ideological alignments, and specific party affiliations contribute to variations in the level of engagement and sentiment assigned to different environmental categories by MPs from Rogaland and their party colleagues.

Applying the empirical strategy in (6.2) to the weighted sentiment score for each topic, only two topics return statistically significant: Energy (A.2.3) and Environmental Protection (A.2.4). Rogaland has a negative statistically significant effect on sentiment in energy topics across all model specifications, meaning that Rogaland MPs talk more negatively than their colleagues, whereas environmental protection has a positive significant coefficient in all specifications with clustering, meaning that Rogaland MPs are more positive regarding the subject. The aquaculture topic also has a significant negative effect from Rogaland, but the results are not robust to party or year controls. All regression tables can be found in Appendix A.2.

7.2.3 Rogaland MPs vs Møre and Romsdal MPs

Having examined the disparities between political parties and MPs from Rogaland, the analysis will now be extended to ascertain the potential influence of local economic structure in Møre and Romsdal. This investigation seeks to determine whether the economic context of Møre and Romsdal exerts a comparable impact on the environmental perspective of its MPs as observed in Rogaland. To this end, a similar approach will be employed, leveraging the insight gained from the first set of result.

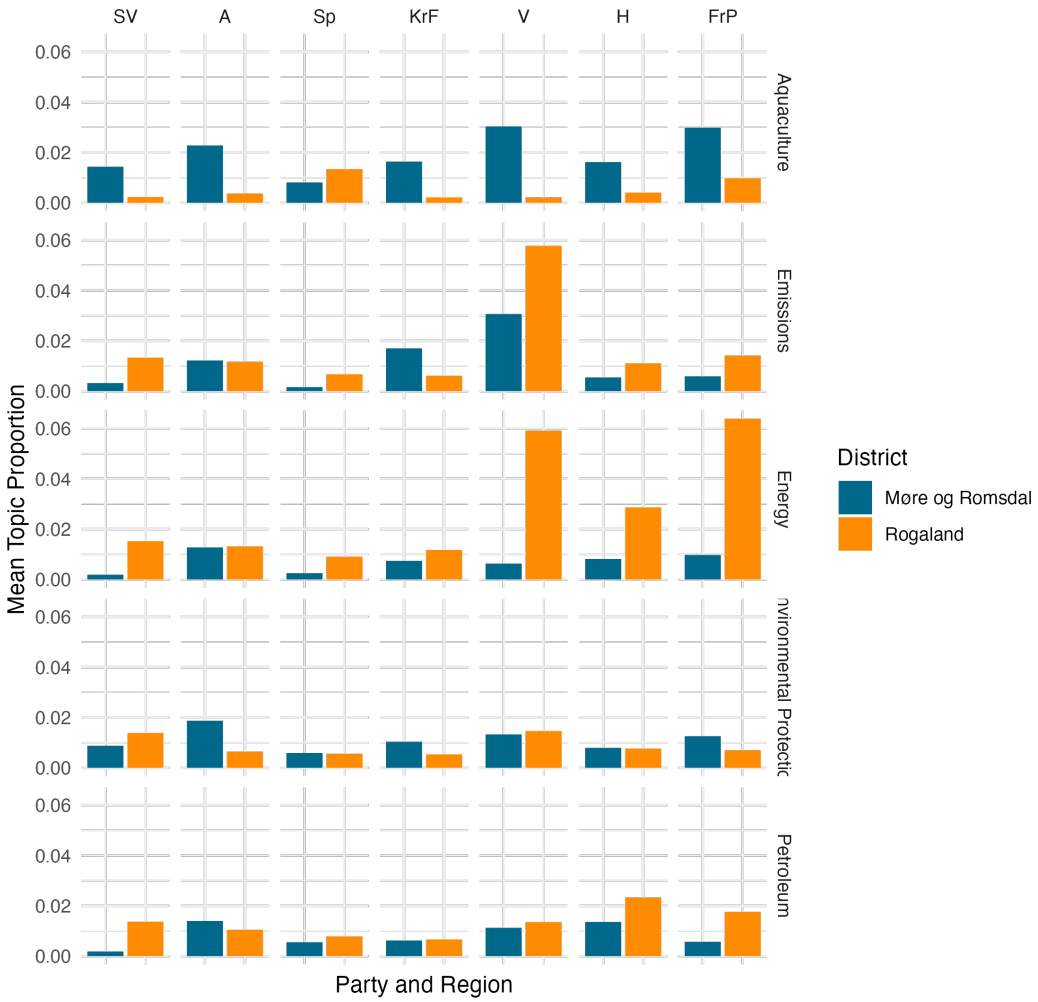
Drawing on the findings from the previous analysis, which outlined the positions of political parties and the engagement of MPs from Rogaland on environmental topics, a comparative assessment will be conducted to ascertain the adherence of MPs from Møre and Romsdal to MPs from Rogaland. Following the same methodology, we aim to outline any degree of alignment or divergence between MPs from Møre and Romsdal and MPs from Rogaland. This includes coverage and sentiment with which MPs from Møre and Romsdal address environmental topics. This evaluation will enable the identification of any differences that may exist between MPs from Møre and Romsdal and MPs from Rogaland in terms of their engagement with environmental issues.

After having previously delineated the disparities in economic structure between Rogaland and Møre and Romsdal, the current investigation seeks to examine whether the predominant sector within each district influences the engagement of MPs in specific topics. Our hypothesis posits that MPs from Rogaland would exhibit greater involvement in energy related topics, whereas MPs from Møre and Romsdal would display heightened engagement in matters pertaining to aquaculture. The subsequent findings presented substantiate our hypothesis.

Analysing the data reveals a noteworthy correlation between the predominant sectors in each district and the topic-specific engagement of MPs. Rogaland MPs indeed demonstrate a higher level of engagement in energy and petroleum topics, aligning with the dominant presence of the petroleum sector in the region. Conversely, MPs from Møre and Romsdal exhibit a heightened interest in discussions pertaining to aquaculture, mirroring the significant presence of this sector within their district.

When examining the categories individually, we can begin by analysing the emission category. Overall, a stable pattern emerges. However, at the party-specific level, notable

Figure 16: Topic Proportions - Rogaland vs Møre and Romsdal



Note: Shows Political party and Region on the x-axis. And mean topic proportion for Rogaland and Møre and Romsdal on the y-axis.

variations are observed. MPs from Rogaland representing all parties except KrF and A demonstrate a higher coverage of the emission topic compared to their counterparts from Møre and Romsdal. In the Environmental Protection topic, the shares are relatively similar for Rogaland and Møre and Romsdal MPs, but A, KrF and FrP have slightly higher shares in Møre and Romsdal.

Moving on to the categories of specific interest, namely energy, petroleum, and aquaculture. In the energy category, MPs from both regions belonging to A exhibit a similar coverage of the topic. It is noteworthy that the party's stance on energy appears to be clearly defined, as no distinction is observed between MPs from the two districts. However, a more distinct pattern emerges within FrP. Rogaland MPs from all other parties demonstrate a higher coverage compared to their Møre and Romsdal counterparts.

In contrast, when considering the petroleum topic, a notable divergence arises. Rogaland MPs from H, FrP, SV, SP, and V exhibit a greater emphasis on the subject compared to their party colleagues from Møre and Romsdal. However, it is noteworthy that Rogaland MPs from A demonstrate a comparatively lower level of engagement with the topic when

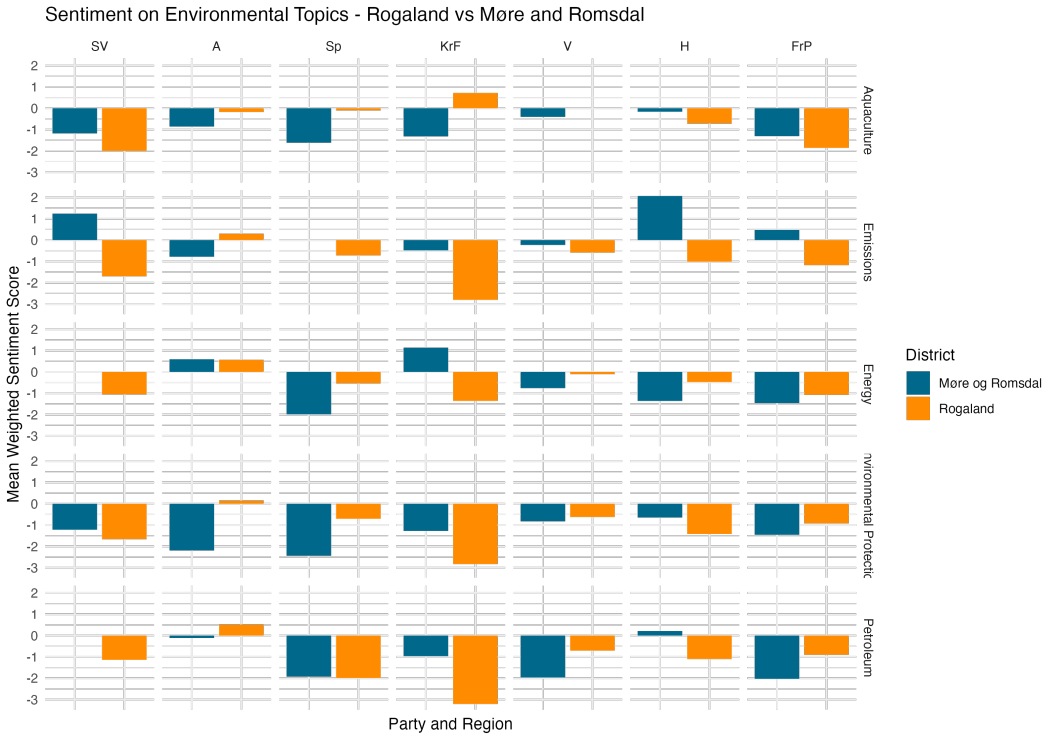
compared to their party colleagues from Møre and Romsdal.

Similar patterns persist within the aquaculture category, with MPs from Møre and Romsdal exhibiting higher coverage compared to those from Rogaland across every political party, except for SP, where SP MPs from Rogaland display greater coverage.

These findings are also supported by our regression model, which provides empirical support for our hypothesis, highlighting the divergent levels of engagement across topics and political parties within the two districts. The economic structures and regional characteristics of Rogaland and Møre and Romsdal contribute to the observed difference in topic coverage among MPs. The regression tables are found in Appendix A.3.

Transitioning to sentiment analysis, as previously delineated, our objective is to provide a more comprehensive understanding of Parliament speech.

Figure 17: Weighted Sentiment Scores - Rogaland vs Møre and Romsdal



Note: Shows sentiment analysis of MPs from Rogaland compared to party colleagues in Møre and Romsdal.

Across all categories, a general similarity in sentiment levels is observed. However notable differentiations emerge within specific categories and among different parties. These differentiations warrant attention and offer valuable insights into the sentiments expressed by MPs.

Firstly, within the aquaculture category, a pattern emerges. Rogaland MPs from KrF exhibit a positive sentiment, while their counterparts from Møre and Romsdal, also belonging to KrF, express a negative sentiment. This divergence in sentiment is unique within the broader aquaculture topic. On a broader party level, it becomes evident that Møre and Romsdal MPs from A and SP tend to be more negative compared to their Rogaland coun-

terparts within the same party. Furthermore, Rogaland MPs from FrP, H, and SV parties display a higher level of negativity compared to their party colleagues.

Secondly, within the emission category, a significant divergence occurs between MPs from H party. MPs from Møre and Romsdal exhibit a higher positive sentiment score compared to their counterparts from Rogaland, who show a negative sentiment. Similar patterns are also observed among MPs from SV, A and FrP from both districts. This discrepancy suggests variations in the attitudes and perspectives of MPs from the same party, potentially influenced by regional economic factors.

Thirdly, in the energy category, sentiment differentiation is evident within KrF Party. MPs from Møre and Romsdal exhibit a positive sentiment score, whereas MPs from Rogaland display a slightly negative sentiment score. Apart from these variations, a general trend of similarity in sentiment scores is observed across parties.

Fourthly, within the environmental protection category, similar distinctions are observed across all parties. Labour Party MPs from Rogaland display a more positive sentiment score compared to their counterparts from Møre and Romsdal displaying a negative score. Additionally, within Sp and KrF party, MPs from KrF Rogaland exhibit a slightly positive sentiment, while those from KrF Møre and Romsdal display a mildly negative sentiment. The opposite effect is displayed between MPs from SP, where MPs from Møre and Romsdal display a marginally negative score compared to MPs from Rogaland.

In the final category of petroleum, a noteworthy pattern emerges in terms of sentiment expressed by MPs. Specifically, MPs from H and A parties exhibit a divergence from their respective party colleagues in terms of sentiment. Furthermore, Rogaland MPs from KrF display a higher degree of negativity compared to their party counterparts. Additionally, within the same respective parties, MPs from Møre and Romsdal, specifically from V and FrP parties, demonstrate a greater level of negativity compared to MPs from Rogaland.

These findings highlight the importance of examining sentiment alongside topic coverage, as it provides insights into the attitudes and perspectives expressed by MPs during parliamentary debates. The regional differentiations observed in sentiment scores underscore the significance of regional dynamics, economic structures, and constituent concerns in shaping sentiment of MPs.

8. Discussion

The research findings contribute to our understanding of the intricate relationship between the political landscape in Rogaland, Norway, and the environmental debates among MPs. The primary objective of politicians, driven by the need for re-election, is to represent their constituents' concerns while adhering to their party ideology. In Rogaland, a region heavily reliant on the petroleum industry, MPs prioritize energy and petroleum topics over environmental protection and aquaculture. This differs from MPs in districts with less dependence on the petroleum sector, who focus more on environmental issues. The local economic structure plays a significant role in shaping parliamentary debates, particularly due to the dominance of A and H and the absence of MDG in Rogaland. The restrictive petroleum policies of MDG conflict with the region's economic structure, influencing voter preferences.

Analysis of the environmental coverage among Rogaland MPs reveal that their engagement in specific topics is significantly influenced by the economic structure. They participate more in emissions, energy and petroleum discussions, reflecting the region's dependence on the petroleum sector. However, their focus on aquaculture and environmental protection is relatively lower compared to MPs from other districts. By examining the environmental discourse within each party, variations in perspectives among Rogaland MPs can be identified. Regardless of party affiliation, Rogaland MPs exhibit higher engagement in emissions, energy and petroleum topics compared to their party colleagues.

Sentiment analysis indicates that Rogaland MPs, particularly those from A, express a positive sentiment when discussing all topics, diverging from the national sentiment within the party. This suggests a distinct perspective among Rogaland MPs regarding the petroleum industry, emissions, and environmental issues. This positive sentiment can be attributed to the economic prosperity and employment provided by the petroleum industry in the region, which shapes MPs sentiment and prioritizes economic considerations over environmental concerns.

Similarly, a comparable pattern emerges within the aquaculture topic, with MPs from Møre and Romsdal demonstrating a greater coverage in aquaculture discussions compared to their counterparts from Rogaland across all political parties. This discrepancy can be attributed to the local economic structure in Møre and Romsdal. The data reveals a noteworthy connection between the dominant sectors in each district and the topic-specific engagements of MPs. Rogaland MPs exhibit a higher level of engagement in energy and petroleum topics, aligning with the region's significant presence in the petroleum sector. Conversely, MPs from Møre and Romsdal display a heightened interest in discussions related to aquaculture,

reflecting the sector's significant presence within their district. These findings provide empirical support for our hypothesis, shedding light on the divergent levels of engagement across topics and political parties within the two districts. The economic structures and regional characteristics of Rogaland and Møre and Romsdal contribute to the observed disparities in topic coverage among MPs.

Nevertheless, there are signs of shifting priorities among the electorate in Rogaland and Møre and Romsdal, as evidenced by the growing support for MDG. This suggests an increasing concern for environmental issues within the regions, which may influence the future policy focus and discourse of the regions MPs as they adapt to changing voter preferences.

Overall, these findings have broader implications for understanding the interplay between economic structure and parliamentary debates. They challenge the conventional belief that economic challenges hinder the pursuit of climate-friendly policies and emphasize the need to consider the specific economic contexts of regions when analysing political debates in parliament.

In conclusion, this thesis presents significant findings that contribute to our understanding of the political context of MPs from districts of interest. Upon reflecting on our introduction, which underscores the constitution and the position taken by the previous Prime Minister, it becomes apparent that the Norwegian economic framework holds a prominent position within the political landscape. Our study provides valuable insights into the substantial impact exerted by the regional economic structures on parliamentary debates.

9. Bibliography

Austen-Smith, D., & Banks, J. (1989). Electoral accountability and incumbency. In P. Ordeshook (Ed.), *Models of Strategic Choice in Politics*. University of Michigan Press.

Barnes, J., Velldal, E., Touileb, S., & Øvrelid, L. (2019). Lexicon information in neural sentiment analysis: A multi-task learning approach. In *Proceedings of the 22nd Nordic Conference on Computational Linguistics* (pp. 175–186).

Benoit, K., Watanabe, K., Wang, H., Nulty, P., Obeng, A., Müller, S., & Matsuo, A. (2018). quanteda: An R package for the quantitative analysis of textual data. *Journal of Open Source Software, 3*(30), 774. https://doi.org/10.21105/joss.00774

Bird, S., Loper, E., & Klein, E. (2009). *Natural Language Processing with Python*. O'Reilly Media Inc.

Bischof, J. M., & Airoldi, E. M. (2012). Summarizing Topical Content with Word Frequency and Exclusivity. In *Proceedings of the 29th International Conference on International Conference on Machine Learning* (pp. 9–16).

Cambridge Dictionary. (n.d.). Corpus. In *Cambridge Dictionary*. Retrieved 30 June 2023, from https://dictionary.cambridge.org/dictionary/english/corpus

Colin Cameron, A., & Miller, D. L. (2015). A Practitioner's Guide to Cluster-Robust Inference. Journal of Human Resources, 50(2), 317–372. https://doi.org/10.3368/jhr.50.2.317

Collier, P. (2010). The Political Economy of Natural Resources. Social Research, 77(4), 1105–1132. JSTOR.

Dewan, T., & Shepsle, K. A. (2011). Political Economy Models of Elections. Annual Review of Political Science, 14(1), 311–330. https://doi.org/10.1146/annurev.polisci.12.042507.094704

Downs, A. (1957). An Economic Theory of Political Action in a Democracy. Journal of Political Economy, 65(2), 135–150. https://doi.org/10.1086/257897

Edwards, C. D. (1955). Conglomerate Bigness as a Source of Power. Business Concentration and Price Policy, 331–359.

EIA. (2022, June 30). Country Analysis Executive Summary: Norway. U.S. Energy Information Administration. Retrieved 30 June 2023, from https://www.eia.gov/international/overview/country/NOR

Finseraas, H., Høyland, B., & Søyland, M. G. (2021). Climate politics in hard times: How local economic shocks influence MPs attention to climate change. European Journal of Political Research, 60(3), 738–747. https://doi.org/10.1111/1475-6765.12415

Fiva, J. H., Nedregård, O., & Øien, H. (2022). Polarization in Party-centered Environments: Evidence from Parliamentary Debates.

Fiva, J. H., Nedregård, O., & Øien, H. (2023). Group Identities and Parliamentary Debates.

Forskningsrådet. (2021). Årsrapport 2020. https://www.forskningsradet.no/siteassets/publikasjoner/2021/arsrapport-2020_endelig.pdf

Foss, E. S. (2022). 1 av 9 har nynorsk som hovudmål i skolen. SSB. Retrieved 30 June 2023, from https://www.ssb.no/utdanning/grunnskoler/statistikk/elevar-i-grunnskolen/artikler/1-av-10-har-nynorsk-som-hovudmal-i-skolen

Grunnloven. (1814). Kongeriket Norges Grunnlov gitt i riksforsamlingen på Eidsvoll den 17. Mai 1814, slik den lyder etter senere endringer, senest stortingsvedtak av 15. Mai 2023. https://lovdata.no/dokument/NL/lov/1814-05-17

Innst. 2 S (2016–2017). (2016). Innstilling fra finanskomiteen om nasjonalbudsjettet 2017 og forslag til statsbudsjett for 2017. Finanskomiteen. https://www.stortinget.no/no/Saker-og-publikasjoner/Publikasjoner/Innstillinger/Stortinget/2016-2017/inns-201617-002s/?all=true&fbclid=IwAR2GjCU8yI7G26o5lYnaw15WvuD6HQSANuCwY_zJjHH5RCle9S_v2szSiMI

Kaysen, C. (1957). The Social Significance of the Modern Corporation. The American Economic Review, 47(2), 311–319. JSTOR.

Kinder, D. R., & Kiewiet, D. R. (1981). Sociotropic Politics: The American Case. British Journal of Political Science, 11(2), 129–161. JSTOR.

Lahn, B. (2019). Norwegian petroleum policy in a changing climate. https:

//pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/2607906/Rapport%202019%2010%20Def%20-%20WEB.pdf?sequence=1

MDG. (n.d.). Utfasing av oljen. Retrieved 30 June 2023, from https://www.mdg.no/utfasing_av_oljen

Medhat, W., Hassan, A., & Korashy, H. (2014). Sentiment analysis algorithms and applications: A survey. Ain Shams Engineering Journal, 5(4), 1093–1113. https://doi.org/10.1016/j.asej.2014.04.011

Mimno, D., & Lee, M. (2014). Low-dimensional Embeddings for Interpretable Anchor-based Topic Inference. Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP), 1319–1328. https://doi.org/10.3115/v1/D14-1138

Mimno, D., Wallach, H., Talley, E., Leenders, M., & McCallum, A. (2011). Optimizing Semantic Coherence in Topic Models. Proceedings of the 2011 Conference on Empirical Methods in Natural Language Processing, 262–272. https://aclanthology.org/D11-1024

Nedregård, O. (2023). Speech is Silver, Silence is Gold: Trade-offs between local and collective representation.

Norwegian Ministry of Petroleum and Energy. (2014). FACTS 2014 The Norwegian Petroleum Sector. https://www.regjeringen.no/globalassets/upload/oed/pdf_filer_2/faktaheftet/fakta2014og/facts_2014_nett_.pdf

Norwegian Petroleum. (2022, July 18). EMPLOYMENT IN THE PETROLEUM INDUSTRY. Norsk Petroleum. Retrieved 30 June 2023, from https://www.norskpetroleum.no/en/economy/employment/

OEC. (2023, April). The Observatory of Economic Complexity. OEC - Norway. Retrieved 30 June 2023, from https://oec.world/en/profile/country/nor

Reed, E. U. (2021, September 7). Siste runde om den siste oljen? Retrieved 30 June 2023, from https://cicero.oslo.no/no/artikler/siste-runde-om-den-siste-oljen?fbclid=IwAR2UZGlIirf33J6UJdusfQI5VXhqsizvlEY0z2fcYG6yyXl6imALuQQ9VoA

Regjeringen. (n.d.). Tidligere regjeringer og historie. Retrieved 30 June 2023, from https://www.regjeringen.no/no/om-regjeringa/tidligere-regjeringer-og-historie/sok-i-regjeringer-siden-1814/id2578015/

Regjeringen. (2020, April 30). Tiltak for olje- og gassnæringen og leverandørindustrien. Retrieved 30 June 2023, from https://www.regjeringen.no/no/dokumentarkiv/regjeringen-solberg/aktuelt-regjeringen-solberg/smk/pressemeldinger/2020/tiltak-for-olje--og-gassnaringen-og-leverandorindustrien/id2700656/

Roberts, M. E., Stewart, B. M., Tingley, D., Lucas, C., Leder□Luis, J., Gadarian, S. K., Albertson, B., & Rand, D. G. (2014). Structural Topic Models for Open□Ended Survey Responses. *American Journal of Political Science*, 58(4), 1064–1082. https://doi.org/10.1111/ajps.12103

Rødt. (2021, March 6). Fjerner sluttdato for norsk oljeproduksjon og sier nei til havvind. Retrieved 30 June 2023, from https://roedt.no/fjerner-sluttdato-for-norsk-oljeproduksjon-og-sier-nei-til-havvind

Sæther, A. K. (2017). De beste intensjoner: Oljelandet i klimakampen (1. utgave). Cappelen Damm.

Salamon, L. M., & Siegfried, J. (1977). Economic Power and Political Influence: The Impact of Industry Structure on Public Policy. *American Political Science Review*, 71(3), 1026–1043.

Sikt. (n.d.). Norsk medborgerpanel runde 24, 2022. Retrieved 26 May 2023, from https://surveybanken.sikt.no/no/study/8ba06662-3d76-4d78-966f-d4f30b9c2de7/undefined?type=studyMetadata&datafile=687f78fd-6ce6-4544-955b-49881fd9863d/5&elements=%5B%5D

SSB. (2023a). Konjunkturtendenser for Møre og Romsdal. Retrieved 20 June 2023, from https://www.ssb.no/nasjonalregnskap-og-konjunkturer/konjunkturer/artikler/konjunkturtendenser-for-more-og-romsdal/_/attachment/inline/a2ba8841-4e1c-41c1-b512-0b7f3c8b6a8e:83f531e3b24299a96b49fe55c3316eeeb9e21292/RAPP2023-14.pdf

SSB. (2023b, May 24). Statsregnskapets inntekter og utgifter. Retrieved 20 June 2023, from https://www.ssb.no/offentlig-sektor/statlige-finanser/statistikk/statsregnskapets-inntekter-og-utgifter

SSB. (2023c, June 1). Utenrikshandel med varer. Retrieved 20 June 2023, from https://www.ssb.no/statbank/table/10482

Stortinget. (n.d.). Politiske partier på Stortinget. Retrieved 30 June 2023, from

https://www.stortinget.no/no/Representanter-og-komiteer/Partiene/Partioversikt/?pid=2021-2025

Stortinget. (2021, September 14). Parliamentary Elections. Retrieved 30 June 2023, from https://www.stortinget.no/en/In-English/About-the-Storting/Elections/

Stortinget. (2023, March 31). Partiene på Stortinget. Retrieved 30 June 2023, from https://www.stortinget.no/no/Stortinget-og-demokratiet/stortinget-undervisning/voksenopplaring-for-innvandrere/lar-om-valg/politiske-partier/

Stortinget Åpne Data. (n.d.). Representantinformasjon. Stortinget Åpne Data. Retrieved 13 June 2023, from https://data.stortinget.no/statistikk/last-ned-datasett/nedlasting-av-representantinformasjon/

WWF. (2021, September 29). DETTE KOSTER OLJESKATTEPAKKEN. Retrieved 30 June 2023, from https://www.wwf.no/nyheter/dette-koster-oljeskattepakken-staten

A. Regression Tables

A.1 STM - Rogaland vs Norway

Regression Tables for all selected topics with topic proportion as the dependent variable, controlled for fixed political party effects (2) and political party and time effects (3). Standard errors in models (1), (2) and (3) are clustered at the district level, whereas (4) is i.i.d. standard errors and (5) have standard errors clustered at district-party level. Empirical Strategy as specified in 6.1 given by:

$$\theta^v_{d,p,t} = \beta^v D_d + \gamma_p + \pi_t + \epsilon^v_{d,p,t}$$

where

$$D_d = \begin{cases} 1 & \text{if Rogaland} \\ 0 & \text{otherwise} \end{cases}$$

A.1.1 Aquaculture

	Dependent Variable: Aquaculture				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0087***				
	(0.0024)				
rogaland	-0.0027	-0.0023	-0.0022	-0.0022***	-0.0022
	(0.0024)	(0.0022)	(0.0021)	(0.0003)	(0.0020)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	269,040	269,040	269,040	269,040	269,040
R^2	0.00033	0.00407	0.00864	0.00864	0.00860
Within R^2	-	0.00024	0.00023	0.00023	0.00022

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.1.2 Emissions

	Dependent Variable: Emissions				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0104***				
	(0.0016)				
rogaland	0.0023	0.0032***	0.0036***	0.0036***	0.0036**
	(0.0016)	(0.0008)	(0.0009)	(0.0003)	(0.0011)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	269,040	269,040	269,040	269,040	269,040
R^2	0.00022	0.10914	0.14343	0.14343	0.14424
Within R^2	-	0.00047	0.00062	0.00062	0.00063

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.1.3 Energy

	Dependent Variable: Energy				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0075***				
	(0.0006)				
rogaland	0.0214***	0.0213***	0.0210***	0.0210***	0.0210***
	(0.0006)	(0.0009)	(0.0009)	(0.0003)	(0.0044)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	269,040	269,040	269,040	269,040	269,040
R^2	0.01527	0.01755	0.02754	0.02797	0.02797
Within R^2	-	0.01493	0.01461	0.01460	0.01460

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.1.4 Environmental Protection

	Dependent Variable: Environment				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0075***				
	(0.0008)				
rogaland	7.38×10^{-5}	0.0004	0.0005	0.0005	0.0005
	(0.0008)	(0.0008)	(0.0008)	(0.0003)	(0.0007)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	269,040	269,040	269,040	269,040	269,040
R^2	2.57×10^{-7}	0.00274	0.00891	0.00891	0.00891
Within R^2	-	6.29×10^{-6}	9.97×10^{-6}	9.97×10^{-6}	9.97×10^{-6}

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.1.5 Petroleum

	Dependent Variable: Petroleum				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0056***				
	(0.0005)				
rogaland	0.0084***	0.0087***	0.0088***	0.0088***	0.0088***
	(0.0005)	(0.0004)	(0.0004)	(0.0003)	(0.0012)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	269,040	269,040	269,040	269,040	269,040
R^2	0.00399	0.00587	0.01403	0.01403	0.01403
Within R^2	-	0.00428	0.00440	0.00440	0.00440

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.2 Sentiment - Rogaland vs Norway

Regression Tables for all selected topics with weighted sentiment score as the dependent variable, controlled for fixed political party effects (2) and political party and time effects (3). Standard errors in models (1), (2) and (3) are clustered at the district level, whereas (4) is i.i.d. standard errors and (5) have standard errors clustered at district-party level. Empirical Strategy as specified in 6.1 given by:

$$y^v_{d,p,t} = \beta^v D_d + \gamma_p + \pi_t + \epsilon^v_{d,p,t}$$

where

$$D_d = \begin{cases} 1 & \text{if Rogaland} \\ 0 & \text{otherwise} \end{cases}$$

A.2.1 Aquaculture

	Dependent Variable: Aquaculture Weighted Sentiment				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	-1.005***				
	(0.0738)				
rogaland	-0.2013**	0.0012	-0.0145	-0.0145	-0.0145
	(0.0738)	(0.1055)	(0.0753)	(0.2519)	(0.1481)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	i.i.d.	district & party_id
Fit statistics					
Observations	3,706	3,706	3,706	3,706	3,706
R^2	0.00020	0.01036	0.04803	0.04803	0.04803
Within R^2	-	6.11×10^{-9}	9.06×10^{-7}	9.06×10^{-7}	9.06×10^{-7}

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.2.2 Emissions

	Dependent Variable: Dependent Variable: Emissions Weighted Sentiment				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	-0.8130***				
	(0.0608)				
rogaland	-0.0353	-0.0344	-0.0230	-0.0230	-0.0230
	(0.0608)	(0.0805)	(0.0627)	(0.1471)	(0.1101)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	i.i.d.	district & party_id
Fit statistics					
Observations	3,912	3,912	3,912	3,912	3,912
R^2	1.73×10^{-5}	0.01276	0.03679	0.03679	0.03679
Within R^2	-	1.46×10^{-5}	6.32×10^{-6}	6.32×10^{-6}	6.32×10^{-6}

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.2.3 Energy

	Dependent Variable: Energy Weighted Sentiment				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	-0.1113				
	(0.1122)				
rogaland	-0.6607***	-0.4910***	-0.4170***	-0.4170***	-0.4170***
	(0.1122)	(0.1208)	(0.1057)	(0.1165)	(1×10^{-5})
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	i.i.d.	district & party_id
Fit statistics					
Observations	4,590	4,590	4,590	4,590	4,590
R^2	0.00937	0.03029	0.05294	0.05294	0.05294
Within R^2	-	0.00393	0.00281	0.00281	0.00281

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.2.4 Environmental Protection

	Dependent Variable: Environmental Protection Weighted Sentiment				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	-1.450***				
	(0.0454)				
rogaland	0.3151***	0.2838***	0.2384***	0.2384	0.2384**
	(0.0454)	(0.0575)	(0.0699)	(0.2112)	(0.0795)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	i.i.d.	district & party_id
Fit statistics					
Observations	3,052	3,052	3,052	3,052	3,052
R^2	0.00076	0.00385	0.02467	0.02467	0.02467
Within R^2	-	0.00061	0.00042	0.00042	0.00042

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.2.5 Petroleum

Petroleum	Dependent Variable: Petroleum Weighted Sentiment				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	-0.9463***				
	(0.1888)				
rogaland	-0.0960	0.0088	-0.1061	-0.1061	-0.1061
	(0.1888)	(0.3170)	(0.2353)	(0.2017)	(0.2302)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	i.i.d.	district & party_id
Fit statistics					
Observations	2,735	2,735	2,735	2,735	2,735
R^2	0.00010	0.01560	0.08531	0.08531	0.08531
Within R^2	-	7.21×10^{-7}	0.00010	0.00010	0.00010

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.3 STM - Rogaland vs Møre and Romsdal

Regression Tables for all selected topics with topic proportion as the dependent variable, controlled for fixed political party effects (2) and political party and time effects (3). Standard errors in models (1), (2) and (3) are clustered at the district level, whereas (4) is i.i.d. standard errors and (5) have standard errors clustered at district-party level. Empirical Strategy as specified in 6.1 given by:

$$\theta^v_{d,p,t} = \beta^v D_d + \gamma_p + \pi_t + \epsilon^v_{d,p,t}$$

where

$$D_d = \begin{cases} 1 & \text{if Rogaland} \\ 0 & \text{if Møre and Romsdal} \\ NA & \text{otherwise} \end{cases}$$

A.3.1 Aquaculture

	Dependent Variable: Aquaculture				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0203***				
	(6.66×10^{-17})				
rogaland	-0.0143***	-0.0140**	-0.0135**	-0.0135***	-0.0135
	(7.79×10^{-17})	(0.0005)	(0.0007)	(0.0005)	(0.0027)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	34,683	34,683	34,683	34,683	34,683
R^2	0.02267	0.02910	0.03766	0.03766	0.03766
Within R^2	-	0.02161	0.01961	0.01961	0.01961

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.3.2 Emissions

	Dependent Variable: Emissions				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0103***				
	(1.57×10^{-16})				
rogaland	0.0025***	0.0043*	0.0025*	0.0025***	0.0025
	(1.61×10^{-16})	(0.0005)	(0.0004)	(0.0004)	(0.0029)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	34,683	34,683	34,683	34,683	34,683
R^2	0.00087	0.04527	0.10190	0.10190	0.10190
Within R^2	-	0.00272	0.00095	0.00095	0.00095

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.3.3 Energy

	Dependent Variable: Energy				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0103***				
	(1.57×10^{-16})				
rogaland	0.0025***	0.0043*	0.0025*	0.0207***	0.0207
	(1.61×10^{-16})	(0.0005)	(0.0004)	(0.0008)	(0.0090)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	34,683	34,683	34,683	34,683	34,683
R^2	0.00087	0.04527	0.10190	0.09653	0.09653
Within R^2	-	0.00272	0.00095	0.01950	0.01950

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.3.4 Environmental Protection

	Dependent Variable: Environment				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0115***				
	(2.67×10^{-16})				
rogaland	-0.0039***	-0.0036**	-0.0031**	-0.0031***	-0.0031
	(2.68×10^{-16})	(0.0001)	(0.0001)	(0.0005)	(0.0017)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	34,683	34,683	34,683	34,683	34,683
R^2	0.00208	0.00517	0.01036	0.01036	0.01036
Within R^2	-	0.00174	0.00123	0.00123	0.00123

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

A.3.5 Petroleum

	Dependent Variable: Petroleum				
Model	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.0089***				
	(3.45×10^{-17})				
rogaland	0.0051***	0.0051*	0.0062**	0.0062***	0.0062
	(1.53×10^{-16})	(0.0004)	(0.0002)	(0.0006)	(0.0022)
Fixed-effects					
party_id	No	Yes	Yes	Yes	Yes
year	No	No	Yes	Yes	Yes
Cluster	district	district	district	IID	district & party_id
Fit statistics					
Observations	34,683	34,683	34,683	34,683	34,683
R^2	0.00243	0.01048	0.02159	0.02159	0.02159
Within R^2	-	0.00246	0.00349	0.00349	0.00349

Standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*