Labor organizations, institutional access and climate change

An analysis of OECD countries from 1990-2018

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Abstract

Labor unions have often been major interest groups within most industrialized economies, and have played a crucial role in the development of worker's rights. However, scholars disagree about the role and effect these labor unions have in climate policymaking. Because climate change policies will affect jobs, some argue that labor unions will work as climate policy opponents. Others point to empirical evidence, and instead claim that labor unions are climate policy proponents and allies for environmental groups. My goal is to contribute with more consistent answers to whether there exists a relationship between the presence and strength of labor unions and the amount of adopted climate policies. Additionally, I seek to better understand the importance of systems of interest representation for this relationship, and see this as an important part of labor unions' strength in policymaking.

I derive hypotheses from distributive conflict theory. Thus, climate change is seen as a policy problem that, at least in domestic politics, leads to distributive conflicts related to economy and employment. Some groups are burdened with costs while others receive benefits from the implementation of climate policies. Thus, the role of labor unions may be central when explaining climate policy action and inaction in industrialized economies. In order to explore these relationships, I utilize negative binomial count models on data on OECD countries from 1990 to 2018. I find partial support for my hypotheses that there exists a relationship between labor union density and the amount of adopted climate policies, and that this relationship is negative. Moreover, the relationship depends on the level of corporatism. However, the results are only somewhat robust, and more research is needed in order to get a better understanding of the issue.

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All remaining faults and shortcomings are my own.

R-scripts can be found at https://github.com/Metteus/MA_thesis_metteus.

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Mette Undheim Sandstad

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Chapter 1

Introduction

In 2012, the Laborers' International Union of North America (LiUNA) took an oppositional stance to the Obama administration's climate policies when they exited the BlueGreen Alliance, a coalition of blue-collar workers and environmentalists who had decided to support the Obama administration's choice to block the controversial Keystone XL pipeline project (Sweet, 2017; LiUNA, n.d.-a). For LiUNA, the pipeline, which stretched for nearly 3,500 km across Canada and the United States, was an indispensable source for new jobs in the oil and gas sectors[1]. When speaking about the policy, the general secretary of the LiUNA stated, "the score is Job-Killers, two; American workers, zero", and further emphasized the organization's disappointment with the American president's choice to side with environmentalists over blue-collar workers "once again" (LiUNA, n.d.-b).

Other American unions, belonging to various different sectors stretching from service to building and construction, have given strong support to the Green New Deal, a policy proposal that seeks to significantly reduce greenhouse gas emissions (Cha & Brecher, 2019; Friedman, 2019). Simultaneously as they stress the importance of "no worker left behind" (Guerrero, n.d.), these unions acknowledge that changes in production must happen in order to combat the worst consequences of climate change. Even though such policies might affect their own sectors, they claim to "have learned that climate change itself is the real job-killer" (Guerrero, n.d.).

For the most part, present-day human activities have become entirely dependent on fossil fuel consumption. As a result, the needed transition to a low-carbon economy will, without a doubt, affect current production methods. Additionally, the transition will also affect the jobs of many workers who are either unwilling or unable to sacrifice their current financial security to potentially help mitigate the effects of climate change in the long run. Labor unions, as groups that aim to protect the interests of their members, might have an effect on the adoption rate of climate policies that are meant to pursue a low-carbon economy. In this thesis, I aim to explore the factuality of the so-called "jobs-versus-environment dilemma" by studying the implications of the presence and strength of labor organizations for climate policymaking. Is there a relationship between the two, and if so, what does it look like? Additionally, I seek to contribute to the literature of climate change as a case of distributional conflict with more statistical evidence.

Previous studies have found various possible implications that labor organizations might have on the environment. Some scholars argue that labor organizations can contribute negatively to climate change mitigation due to the idea that labor unions will almost always prioritize job

[1] The U.S. State Department claimed that the number of people needed for this project would, in reality, only number around 50 (Funke, n.d.)

security. And because the total number of jobs for certain industries will most likely be reduced significantly during a transition to a low-carbon economy, the unions representing these industries' workers are likely to block policy suggestions that might affect their interests. In this view, labor organizations will protect their members' jobs over anything, and work against climate policies that affect jobs (Doerflinger & Pulignano, 2018; Glassner & Keune, 2010; Cappelli, 1985). However, there exists evidence which also points in a different direction. For example, union members are overall more positive towards environmental protection than others (Vachon & Brecher, 2016; Kojola, Xiao, & Mccright, 2013). Some scholars even find that carbon emissions are lower in countries with higher union density (Hyde & Vachon, 2018; Alvarez, McGee, & York, 2019). Conversely, a third group of scholars have pointed to the importance that institutions have on interest representation, finding that the presence and size of labor unions correlate with higher carbon emissions, especially in political and social systems where these groups have special access to policymaking (Gronow, Ylä-Anttila, Carson, & Edling, 2019). Other recent scholars, such as Finnegan (2019) and Mildenberger (2020), find that corporatism, an example of the mentioned systems, moderates the negative effect of labor unions. What I find from the literature is that there is a lack of quantitatively conducted studies, as well as a lack of consistent answers.

Many of the contributions on labor organizations in connection to environmental protection are qualitative studies, and are often based on evidence from specific countries. While such paths are ideal when developing new theories, they do not lead to generalizable evidence. The few quantitative studies conducted suffer from a bias in the chosen control variables. For instance, Alvarez et al. (2019) focus solely on employment related variables and therefore they might suffer from omitted variable bias. The literature on corporatism also lacks consistent answers, although a few more quantitative studies with the potential of general answers do exist. However, they often lack a focus on the importance of specific interest groups within these systems. Additionally, studies have most often chosen greenhouse gas (GHG) emissions as the outcome variable. It seems that studying the effect of labor organizations' presence or strength on emissions might illuminate some important trends in the data. Nevertheless, it can be difficult to account for other underlying factors affecting GHG emissions besides interest groups and institutions. Furthermore, studying GHG emissions would, to a large degree, equal studying the potential policy outcomes, rather than the mechanisms behind the making and adoption of policies.

In order to contribute to filling the gaps present in the literature, I first must take one step back in order to get a broader picture. Earlier research has presented different reasonings for the role of labor organizations in climate policymaking. However, if there actually exists a broad, statistical relationship at all, it has yet to be determined. Thus, my first goal is to investigate if such a relationship can be found. The positive or negative effects of this potential relationship present themselves simultaneously and can give evidence for how labor organizations are to be seen in relation to climate policymaking. Broadly speaking, they can either be advocates for economic growth and protectors of jobs in high-carbon sectors, or concerned with public goods and work alongside environmentalists for climate change mitigation[2]. And for my second goal, I investigate if this potential relationship is moderated by systems of interest representation, with a focus on corporatism. Corporatism can mute the distributive conflict of climate policies and thus lead to a higher number of adopted climate policies. On the other hand, if the groups that are given special access through these systems of interest representation oppose most climate policies, then corporatism could lead to a lower number. As such, my research question is as

[2] In a nuanced reality these might not be two exclusive groups, of course

follows:

Is the size of labor organizations associated with the amount of adopted climate policies? If so, does this depend on formalized access to policymaking?

I argue that with already existing data, I can explore these relationships more broadly than what has been done before. A quantitative study has the potential to draw more generalizable conclusions, and is the only method to determine whether a relationship is systematic across multiple countries and time periods. Moreover, I hope to contribute to a more conclusive answer to the question of organized labor's association with climate change policymaking[3]. In order to do so, I study a panel dataset that consists of data on OECD countries from 1990 to 2018. Because labor organizations have been important interest groups for economic and industrial development within most industrialized countries, it is beneficial to limit the sample to OECD countries. Furthermore, these countries are more easily comparable to each other. Climate change is a relatively new policy issue, and was not explicitly discussed globally until the Rio Earth Summit in 1992 (United Nations, n.d.). Therefore, 1990 is a reasonable year to begin the sample. Rather than focusing on the effect of labor organizations' size and strength on GHG emissions, I choose to utilize a count of newly adopted climate policies per country per year as my dependent variable. It is more likely that labor organizations affect the adoption of climate policies than GHG emissions, and thus I seek to highlight the correlation between labor organizations, institutional access and policymaking more directly.

I utilize three negative binomial count models, with different specifications, in order to investigate the data at hand. Most of my findings give support to the hypothesis that there exists a relationship between labor union density and the amount of adopted climate policies. Furthermore, all models suggest that this relationship is negative. Thus, my findings indicate that labor unions, at least the ones that are represented in my data, might work as climate policy opponents rather than working for other public goods or alongside environmentalists. Most labor unions in the data are from high-carbon sectors which suggest that, at least when speaking of these specific groups, there are some unfavourable implications of including unions in climate policymaking. However, I also find partial support for the hypothesis that this relationship depends on the system of interest representation. Some of my findings suggest that characteristics that are often assigned corporatist systems moderates the negative association of labor unions on the adoption of climate policies. This indicates that these systems have some mediating effects on distributive conflict. Nevertheless, the association of labor union density on the amount of adopted climate policies stays negative.

1.1 Structure

Following this first introductory chapter, the thesis is structured as follows. In chapter 2, I present the previous literature on labor organizations, interest group representation and the environment. The two main gaps that I detect from this chapter is that there is a lack of quantitative studies and that the findings from the literature differ because of this. Chapter

[3]I do not aim to determine causal relationships in the data. Before determining if a causal relationship exists, it is necessary to investigate whether a correlation can be detected at all. If this is the case, and the correlations are in line with the theorized expectations, then one can begin to investigate causality.

3 consists of the theoretical framework of the study. There, I highlight the implications of climate change as a policy problem which are central to this thesis. Additionally, I present discussions on climate change implications for labor markets, definitions of labor organizations and corporatism, and a discussion on the distributive conflict theory that frames my arguments. The three hypotheses derived from the theory can be found in section 3.4. In chapter 4, I begin with a presentation and description of the data and sample. What follows is the operationalizations of all variables, how they were adapted to the panel data structure, and where they were sourced. In chapter 5, I present and discuss the methodology and the main methodological challenges. My results, and the discussion that follows, are presented in chapter 6. Chapter 7 contains my conclusion and suggestions for further research. Additional statistics, different model specifications, and model diagnostics can be found in the appendices that follow after the bibliography.

Chapter 2

Literature review

This chapter summarizes central contributions from the literature on labor organizations and corporatism in connection with the environment. The main focus of this thesis is climate policymaking. Literature on environmental policymaking will also be reviewed because there is a limited amount of literature that specifically concerns labor organizations and climate policymaking. Furthermore, climate change has many of the same implications for policymaking as broader environmental concerns, which makes these contributions equally important when assessing previous studies. The findings from this thesis contribute to this broader literature on the link between environment and labor and institutions, but more specifically they contribute to the literature on climate change policies as a case of distributive conflict. First, I assess the literature on labor organizations and the environment. Second, I review central contributions on corporatism and the environment.

2.1 Labor organizations

In general, interest groups can be described as organizations that attempt to influence public policy, most often in favor of the interests of the group's constituent members. These interest groups often work in close partnership with governments to achieve their goals, although they are not necessarily working on behalf of the government (G. K. Wilson, 1990, p. 1). Usually, they are self interested, prioritizing members' interest even if those interests don't necessarily provide a greater social good or benefit to the public-at-large (Baroni, Carroll, Chalmers, Maria Muñoz Marquez, & Rasmussen, 2014, p. 145). Labor organizations have been, and still are, very central interest groups in many liberal democracies, working to secure the interests of their members: employers and employees. Due to the size and scope of their activities, labor organizations are of great importance for social and economic policies. In the following section I present literature on organized labor and how they might affect environmental or climate change policy. Most often in the literature, organized labor is measured as the presence or strength of labor unions, but sometimes also as collective bargaining. The following section, however, is concerned with the relationship between labor organizations and environmental performance alone. Literature on how political institutions might affect such relationships is presented in section 2.2. Overall, the findings are conflicting. The institutional access and participation in government by organized labor, as well as their presence and size, has been shown to be both positive and negative for the environment.

Why organized labor might be bad for the environment

In the body of literature that sees organized labor as a potentially harmful factor for the environment, economic growth and job security are considered to be an impediment to environmental protection. The literature on collective bargaining can give insight into how labor unions will deal with the effect of decarbonization on employment, especially when the evidence presented in that literature is concerned with times of economic crisis. Studies find that when core employment is threatened, labor unions are more willing to make concessions on management-labor relations, e.g. reduce or freeze wages, as long as jobs stay secure (Cappelli, 1985; Glassner & Keune, 2010; Glassner, Keune, & Marginson, 2011; Doerflinger & Pulignano, 2018). In certain sectors, decarbonization will likely affect job security, and may lead labor unions to accept fewer perks in exchange for employment stability. Such measures demonstrate a potentially negative effect of organized labor on climate change as many labor organizations fight for the presence of jobs in fossil fuel industries. Unions would likely want to stop, or at least slow down, changes in the industry in order to secure jobs. Bernauer and Koubi (2013) find that countries with stronger employment protection laws are associated with higher emissions levels. Thus, they conclude that unions which are likely to fight for employment protection schemes, have slowed down the pursuit of environmental protection policies because the concern of protecting high-carbon industries is more important than concerns about the environment.

Furthermore, Räthzel and Uzzel (2011) find that unions almost exclusively focus on issues such as the quality of life of workers. Nature, as an issue in itself, is rarely a core component in what constitutes the interest of most unions. Thus, while labor unions might care about climate change because of the effect it may have on jobs, the authors' observation maintains the concept of labor unions as social and economic movements as opposed to environmental ones. In other words, climate change is not an important issue for unions at all, as the only important concerns are employment related ones. This suggests that labor unions will be unimportant for environmental protection, but simultaneously points towards an indirectly negative association if the proposed policies affect work security in any way. The greatest focus of labor unions is not directly the effects climate change might have on nature, but rather what might happen to workers when production is affected either by climate change itself or by implications of climate change policies (Räthzel & Uzzell, 2011, p. 2021).

Labor unions are thus seen as organizations that are mainly concerned with economic growth. Accordingly, their main agenda is to secure the economic and industrial interests of their members. In this sense, it would mean that unions could stand as opponents to newer, more environmentally friendly production methods in order to protect the workers that are currently relying on more harmful, polluting methods (Hyde & Vachon, 2018, p. 270). This is the classic understanding of the jobs-versus-environment dilemma, where jobs and economic growth are seen as opposites to environmental protection. The treadmill of production is a literature tradition that falls in line with this view, where the state, business, and labor are seen as the three pillars that together keep the treadmill of economic growth and environmentally harmful production running (Schnaiberg, Pellow, & Weinberg, 2000). Furthermore, many studies have found an independent, negative effect on climate action, caused by economic dependence on high-carbon sectors, which might enhance the possibly negative effect labor unions could present (Colgan, Green, & Hale, 2020; Johnsson, Kjärstad, & Rootzén, 2019; Tvinnereim & Ivarsflaten, 2016; Le Quéré et al., 2019).

Doerflinger and Thomas (2018, p. 383) find that there are three ideal-typical strategies unions take when dealing with climate change policy: opposition, hedging and support. Many unions that belong to high-carbon industries take the opposition stance, and even more are associated with the hedging strategy. This further underlines the notion that unions will oppose or try to slow down changes in industry when climate policies are threats to employment security. Today, union strategies are mostly embedded in sectoral interests, but strategies are mediated by union identity, meaning that whether the union representatives see themselves as part of the market, society, or having a class perspective will affect the strategy of the union (Doerflinger & Pulignano, 2018, p. 394). Being a part of the greater society is related to having more concerns about climate change, while a perceived belonging to the market or to the working class could facilitate a deeper concern for economy and industry. In addition, the will of the union members, what Doerflinger and Thomas (2018) call union democracy, comes into play. Unions are not one uniform group, but rather many different organizations with different attitudes and actions connected to the environment[1]. No matter the specific strategies, there is overall a disconnect between words and actions. While many unions often give vocal support to decarbonization, there is a disconnect between their principles and their actual strategies and actions (Doerflinger & Pulignano, 2018, p. 396). This means that although unions act positively towards any action intended to decarbonize the economy, they rarely act on this in praxis.

Why organized labor might be good for the environment

However, climate change concerns are not completely absent within labor unions' climate discourse. One of the interview subjects from Räthzel and Uzzel's (2011) study does highlight the relationship between nature and humanity, which could represent a coming shift in labor unions' ideas of climate policymaking, although this has yet to be the case (Räthzel & Uzzell, 2011, p. 2022). Other scholars argue that organized labor has, in fact, acquired this "anti-climate" reputation unfairly. Many of them argue that there are only a few examples of opposition, and that many unions are supportive of environmental concerns (Hampton, 2015, 2018; Vachon & Brecher, 2016; Kenfack, 2020, e.g.). Compared to what many other scholars suggest, Felli (2014, p. 392) finds that unions have a broad focus on climate change and how to combat it. Although he also emphasizes that climate change is not an important concern for most union members (Felli, 2014, p. 391), he argues that labor unions have the potential to challenge our existing view of the relation between social welfare and climate policy. In addition to proving how action towards climate change mitigation is widespread in international labor unions, he highlights the historical importance labor unions have had for environmental policies in industrial countries. As a specific example he refers to so-called "green bans", most present in 1970's Australia (Felli, 2014, p. 373). This refers to strikes that were instigated by organized labor of various forms in support of environmentalism[2]. In fact, some studies find that, in many instances, unions have incorporated environmentalist views as part of their agendas. Work related issues does not necessarily have to oppose climate change policies, as climate change and other environmental concerns might affect the well-being of workers more directly than affect the actual employment (Snell & Fairbrother, 2010, p. 422).

Scholars such as Brecher and Vachon (2016) and Kojola et al. (2013) focus on the preferences union members have when determining if organized labor is potentially good or bad for environmental policymaking. Brecher and Vachon (2016) find, through examining survey responses from the United States, that union members are slightly more likely to support environmen-

[1]This is further discussed in both the theory and operationalization chapters 3 and 4

[2]Some of these events concerned the protection of parks and housing and are not directly relevant for climate change, though it highlights how organized labor have other purposes than employment protection at any cost

tal protection than the rest of the population. While the results are statistically significant, the authors acknowledge limitations to their conclusions related to how these attitudes vary across sectors (Vachon & Brecher, 2016, p. 198-199). Furthermore, these findings are limited to only one country. For the most part, the United States has low union membership rates, which could indicate that labor unions have a weaker position compared to countries with high union membership rates. Moreover, low overall membership rates might indicate that the unions represent specific sectors to a larger degree. Industrial workers are traditionally the most well organized, which is interesting when viewed in relation to the dark picture that was painted by scholars who point at unions' potentially bad influence on environmental performance. Kojola et al. (Kojola et al., 2013) find similar results, and argue that the attitudes of union members have stayed quite stable. During economically strong times they tend to have more positive environmental attitudes, and stable attitudes in times of a weaker economy (Kojola et al., 2013, p. 72). These observations stand in opposition to other understandings of unions as being affected by employment security and economy. While the attitudes of members do not necessarily dictate the actions of labor unions, the objective of unions is to represent their members (Barca, 2012). This suggests that unions are more environmentally concerned than what was previously thought, and contends that unions are not only special interest groups, but "an organized voice of workers fighting for gains for the entire working class in all arenas of life, including the environment" (Hyde & Vachon, 2018, p. 271).

Silverman (2006, p. 191) makes a similar point when highlighting the important role organized labor has previously had in pushing international institutions to adopt their positions on work related issues. This, he claims, gives labor unions a great potential to accomplish the same for pro-climate positions in other arenas. Through literature reviews, interviews, and attending UN conferences as an observer (Silverman, 2006, p. 192), he finds that the labor movement is divided, but that there exists some optimistic developments in how labor unions promote green interests (Silverman, 2006, p. 206). Additionally, Paul Hampton (2018, 2015, p. 471) points out that labor unions have great potential to strengthen efforts made to mitigate and adapt to climate change. Beyond the simple fact that large groups are more influential, labor unions have power and influence through their historical link to policymaking. To begin exploring this potential, he studies if "climate champions", a voluntary role as a climate representative which is given to chosen employees in the UK, have had an effect on labor unions' own climate action, or if the role works mostly as performative action. He finds that these "green" union representatives often executed efforts to better the climate action of the workplace despite the objections of the government or employers. Even when blocked by other actors, they pursued these efforts (Hampton, 2018, p. 482). This proves that actors within unions might work hard towards mitigating their workplaces' contribution to climate change and gives support for the arguments that labor unions could very well be helpful interest groups for climate policymaking. However, Hampton (2018) does not consider situations where employment stability is threatened, which might affect the will to execute such efforts.

Similarly, Kenfack (2020, p. 182) argues that labor movements are reinventing themselves by including climate issues alongside their traditional work-related ones, to the extent that climate protection is becoming part of the protection of workers' wellbeing. He finds that although most union members continue to be worried about the trade-off between jobs and environmental concerns, labor unions from the Portugese labor union Confederation show proactive behavior in the "climate jobs campaign" he studies (Kenfack, 2020, p. 183). The overall conclusion is that unions are showing an increasing interest in climate concerns, and labor movements of various kinds should take even more part in developing programs for a just transition (Kenfack, 2020, p.

199-200). There are instances of unions who have demanded regulations for water, air pollution, the disposal of toxic chemicals, and other environmentally related work safety issues (Barca, 2012). Overall, there seems to be many examples of how labor unions and environmentalists have worked close together both in the past and more recently (Hyde & Vachon, 2018, p. 271).

Most of these studies on labor unions and climate change are qualitative case-studies or quantitative surveys that, for the most part, can be utilized when talking about that specific case or similar cases. Despite this, what they are capable of demonstrating is how labor unions express their principles related to climate change, as well as how the unions themselves deal with climate policy. While all the previously mentioned studies emphasize how labor unions might be important when studying climate policymaking, none of them determine whether the size or strength of labor unions in fact is associated with climate policy. Alvarez, McGee and York (2019) have carried out one of the few quantitative studies done on the effect of labor unions on climate change. Through a cross-national panel analysis, they examine whether labor unions, and other labor related variables, affect CO2 emissions - an important GHG that drives much of the climate change known to be caused by human activity. They find that higher union density correlates negatively with CO2 emissions, even when controlling for other labor related factors (Alvarez et al., 2019, p. 33). They suggest that this effect might have something to do with unions' ability to redistribute resources to social programs, and argue that unions might contribute with lower GHG emissions due to a focus on safe work and cleaner production (Alvarez et al., 2019, p. 34). What Alvarez et al. (2019) fail to address is the importance of labor organizations' access to policymaking. Additionally, they control for few highly likely relevant variables, such as EU membership. Thus, the correlations they find might actually be caused by other factors and lead to biased results. Hyde and Vachon (2018) also explore the quantitative data available to study the association between union density and GHG emissions. They find that unions seem to limit GHG emissions, but that this is not the case in countries with very strong employment protection laws. However, in systems where union participate in policymaking, such as corporatist ones, they tend to fight for measures that lead to a reduction of emissions (Hyde & Vachon, 2018, p. 279).

Cadman, Glynn and Maraseni (2017, p. 10) utilize a framework of ecological modernization to "find out whether climate change policy should be concerned with the interventions of organized labor". They find great diversity between different union members and their view of their own influence on climate policymaking. Some respondents highlight the importance of the international labor union confederation and their cooperation with NGOs in bringing just transition and human rights into the climate change discourse. Nevertheless, the importance of unions seem to vary at both the international and national level. Where some claim that their relevance differs along with the parties in government, others claim that there is little recognition of labor unions outside of those in high carbon sectors (Glynn et al., 2017, p. 175). Yet other respondents focus on the *potential* of unions to create more fair climate change policies, saying that if public sector unions are not represented, the climate policies that come out might lack important inputs (Glynn et al., 2017, p. 176).

2.2 The importance of institutional access

Just like other interest groups, labor organizations also need access to policymaking to be explicitly relevant for policy formulation and adoption. Without access to this, their influence depends on other factors, such as size. The system in which interest groups can influence policymaking differs from country to country. Systems that enable a few large interest groups to represent their sector of society, e.g. labor, and work closely with governments in the formulation and implementation stage of the policy process, are usually referred to as corporatist (G. K. Wilson, 1990, p. 22). In this section, I present the literature on corporatism and the environment to illuminate how labor organizations are theorized to affect climate policymaking in such systems. Corporatism is often found to have an independent effect on climate policymaking, but is also important because it says something about how labor organizations might or might not gain access to decision making. For instance, if labor organizations seem to have a bad influence on climate policymaking, corporatist systems might be bad for the environment in the sense that a central interest group takes part in policymaking. On the other hand, if labor organizations are positive towards climate policies, then they might be helpful for such policies within a corporatist system.

Amongst the most central, earlier studies on corporatism and the environment one typically highlights Scruggs (1999, 2001) and Crepaz (1995). Both of these highlight how corporatist systems are often favourable for the environmental performance for the sample of industrialized countries they study. These systems of interest group representation are relevant when studying what enables labor organizations and other interest groups to affect climate policymaking. Both Scruggs (1999, 2001) and Crepaz (1995) utilize a basic definition of corporatism as institutions that control the correspondence between interest groups and the policymaking and governing state apparatus. Ideal-typical corporatist states are characterized by a high level of policy concertation and aggregated interest representation (Scruggs, 1999, p. 3). When looking closer at these studies, it does become evident quite early that there are multiple ways to measure this concept. Crepaz (1995, p. 393) chose to go with a dichotomous division between corporatist and non-corporatist countries, while Scruggs (1999, 2001, p. 2) treats the concept as a continuum ranging from corporatist to pluralist. There does not exist one agreed upon measure of corporatism, as highlighted by the number of definitions and operationalization of the soon to be mentioned studies. Crepaz (1995, p. 408) and both of Scruggs' (1999, 2001, p. 30) studies suggest a positive impact of corporatist systems on environmental outcomes. One suggested reason is because corporatist countries might be better at providing public goods, and are generally more inclusive (Crepaz, 1995, p. 407). They could also be better systems for representation of the interest of the public, as big interest groups are "guaranteed" access to important discussions. If the public then becomes more concerned with environmentalism than previously, corporatist systems could more quickly incorporate these concerns into policymaking.

One classic criticism of corporatism that Scruggs (1999, p. 4) highlights is that such systems have an inherent hostility to environmental interests within the dominant interests in the systems. Additionally, they are (or at least were) viewed incapable of incorporating new ecological issues to achieve major policy changes. This is because the main interests in corporatist systems are often business and labor, which means that this view is complimentary to the "treadmill of production" theory. Mildenberger (2020) is one scholar who argues that it is exactly this dynamic between interest group representation and industrial labor unions that is the issue for the lack of climate action in most industrialized countries. He emphasizes how powerful labor unions can sometimes "block" climate reforms based on workers rights. Industrial, and other high-carbon sectors', unions are seen as the biggest problem. In certain institutional systems, such as more corporatist ones, carbon-dependent unions have enjoyed formal links to policymaking through their ties to left-leaning coalitions. While carbon dependent businesses are often close to right-leaning coalitions, this cannot explain differences between countries and through time because it is the case in all industrialized countries (Mildenberger, 2020, p. 21). The main argument in his work is that corporatist systems might have more climate policy than pluralist systems, but that these policies are less stringent. This is due to the leverage that industrial labor organizations are provided in such systems. By interviewing central people in policymaking in the United States, Norway, and Australia he finds support for his hypotheses (Mildenberger, 2020, p. 65-161).

Scholars in the body of literature on veto players have similar arguments about the importance of the nature and number of institutions for climate change policies. For instance does Madden (2014) find that a higher number of institutions that policy adoption have to deal with, is associated with less climate policy-adoption rates. While studies within this literature focus on many different institutions, such as political parties as well as interest group representation, it highlights the importance of institutions for climate policymaking in general. The logic is that institutions work as barriers for policy adoption, and that if the veto players on the way towards adoption do not support the policy it will have low chances of being adopted (Madden, 2014, p. 486). While the focus is not specifically on organized labor, as in this thesis, it provides useful insight to exactly how and why they might be of importance. Like Mildeberger (2015, 2020), scholars such as Finnegan (2019) also focus on institutions from a persepctive of distributive conflict theory. The latter have less of a focus on specific interest groups, but arrives at somewhat similar conclusions. He finds that both electoral institutions and systems of interest group representation affect the content of climate policies. While representative electoral institutions have characteristics that allow political leadership to inflict costs on close actors, corporatism[3] helps political leadership control opposition from industry and business because they can bargain for compensation for policy "losers" (Finnegan, 2019, p. 34). Thus, corporatist systems should have positive effects on climate policymaking. Mildenberger (2020) finds that corporatist countries should have *more* climate policies than others, but that they are *less stringent* because of exactly this bargaining opportunity.

Other scholars criticize the way that the concept of corporatism has been measured, and some point to various methodological challenges. Neumayer (2003, p. 208) is one that specifically have criticized Scruggs (1999, 2001) and Crepaz (1995) for being of cross-sectional nature with few total observations[4]. Because of this, he contends that their results are not robust across different time periods and statistical model specifications. To avoid the same pitfalls as earlier studies, he instead utilizes panel data and conducts analysis with both fixed and random effects models in order to achieve more generalizable answers. However, he does not find support for the positive effect of corporatism on environmental or climate performance (Neumayer, 2003, p. 206-208). Rather, what he finds is that corporatism does not have any statistically significant relationship on emissions at all, neither positive nor negative. He concludes that it is a myth that corporatism is good for the environment (Neumayer, 2003, p. 219).

Gronow, Carson, Edling and Ylä-Anttila (2019, p. 1061) argue that the different results found in the literature might stem from previous studies oversimplifying the concept of corporatism. Instead of treating it as a dichotomous or continuous measure, Gronow et al. (2019) choose to focus on certain components that can describe corporatist institutional designs. These include inclusiveness, consensualism, and the strength of tripartite organizations (Gronow et al., 2019, p. 1061). They conduct a case study with a "most similar systems design", where they compare Sweden and Finland as two perceived corporatist countries with differing environmental performance. What they find is that Sweden has a more inclusive and consensual climate change policy network, while Finland places emphasis on tripartite organizations to a larger extent (Gronow et

[3]Finnegan (2019) looks specifically at concertation, but as earlier stated this is an important part of corporatist systems

[4]Scruggs looks at 17, while Crepaz looks at 18 industrialized democracies, for short or no time periods

al., 2019, p. 1061). In turn, Sweden's climate policies are seen as more ambitious than Finland's, and their GHG emissions are the double of Sweden's emissions (Gronow et al., 2019, p. 1062). This suggests that what might be bad for the environment in terms of central components of corporatism, is in fact the strong position of labor organizations and business in some corporatist countries. Of course, what is not answered in this study is exactly what would be of more effect: labor or business.

2.3 Summary of previous literature

In the growing, but currently limited, body of literature on labor organizations' effect on climate change, and environmental or climate policy, no consistent answers are given to whether there exists an effect or not. This might be due to the fact that most of the studies conducted on the subject are qualitative studies centered around the relationship in a specific region. While this gives some useful anecdotes that might point in the direction of an answer, it does not say much about the general effect of labor organizations on climate policymaking. Moreover, the different studies discussed in this chapter do not give consistent answers on the eventual direction of an association. Some of the studies find that labor unions might be important interest groups because they will contribute to more or better climate or environmental policy. This might be due to unions' connection to local communities, a focus on broader public goods such as clean air, or that they incorporate climate and environmental concerns into their strategies. Others point to the jobs-versus-environment dilemma and how labor organizations, especially in the high-carbon industry, can block useful steps towards a low-carbon economy due to their often powerful access to policymaking. The latter argument sees labor organizations as mainly concerned with economic growth and employment protection.

While the studies on corporatism and the environment to a larger degree contain quantitative ones, and therefore have the potential for more generalizable answers, no consistent answers are found here either. Many studies point towards a positive relationship with the environment, but scholars are far from unified. Some have identified different definitions or operationalizations of the term as a reason for different conclusions, and others have pointed out that it might make more sense to analyze central components of corporatism, e.g. centralized bargaining or concertation. It does seem that scholars in the veto player literature and the distributive conflict literature agree on a positive association between central components of the corporatism concept and the amount of climate policies, but that the content of these policies might be more consumer-oriented or overall less stringent according to the latter theoretical view (Mildenberger, 2020; Finnegan, 2019).

Moreover, previous literature often have a general focus on the relationship between labor union presence or strength and GHG emissions. Instead, I believe it is more fruitful to investigate the association with the amount of adopted climate policies. Climate policies are the direct outcome of policymaking processes. According to the previous literature, labor unions seem to affect the formulation and adoption stages of the policy process, which is why this is a natural focus point. Furthermore, it is necessary to investigate whether there is an effect of labor union presence or strength on the amount of adopted climate policies, before looking at the content of policies (i.e. where costs are distributed) or what might be part of the policy outcome (e.g. GHG emissions). As such, I seek to answer the following research question: *Is the size of labor organizations associated with the amount of adopted climate policies? If so, does this depend on formalized access to policymaking?*

Chapter 3

Theoretical framework

In this chapter, I present the theoretical framework. First, I will explain what characterizes climate change as a policy problem. Climate change does not revolve around only one dimension of problems, which makes it notoriously difficult to deal with. By discussing climate change as a policy problem, I seek to make it clear that climate change policy is not affected by just a few narrow categories, but rather is greatly encompassing. Moreover, there are some obvious implications of the encompassing nature of climate change for policymaking that becomes evident from this discussion. Second, I explain other key concepts, such as labor organizations and corporatism. Here, the point is to explain exactly what labor organizations are, while also outlining the channels that they might work through in order to affect policymaking. What is mostly of interest to this thesis are the strategies related directly to the organizations (e.g. strikes), as well as institutional arrangements of interest representation (i.e. corporatism). Third, I provide a discussion on the overarching theory that this thesis falls under, namely distributive conflict theory. Lastly, I map out the hypotheses that are derived from this analytical framework.

3.1 Characteristics of climate change as a policy problem

Much of the earlier research regarding labor organizations and institutional access has had a broader focus on environmental policy and performance. This can include issues such as responses to deforestation, as well as air or water pollution. Climate change, however, is a specific type of environmental issue, and refers to long-term changes in the typical weather on Earth. Although scientists uncovered global warming as early as 1896, it did not become a pressing issue for policymakers until the late 1980's, and was not the subject of any international frameworks until the UN Earth Summit in 1992 (Revkin, 2018). The most important measure of climate change is the increase in the mean temperature on Earth. Most scientists today agree that much of this observed increase in the temperature on Earth, as well as the consequences of it, are caused by human activity. This can be attributed mostly to the use of fossil fuels that have been increasing in use after the industrial revolution. The use of such energy sources emits greenhouse gases (GHG) that, in turn, heat up the atmosphere (Wall, 2015; Edenhofer et al., 2014).

Typically, climate change policies revolve around mitigating climate change by attempting to limit, or fully stop, GHG emissions (Edenhofer et al., 2014, p. 7). These efforts can be either of a direct or indirect nature. Furthermore, climate change differs from any other political issue that public authorities are used to dealing with. It is a good example of what Head and Alford (2015) call "wicked problems". Solutions to such problems are not as straightforward as they are for more traditional, technical policy issues, and are often more reliant on political decisions rather than scientific input (Head & Alford, 2015, p. 713). Most scientists agree that limiting GHG emissions would limit the effects of climate change but there is no clear answer to exactly how this should happen. Fossil fuels are embedded within most of human activity, making the solution to climate change something that will affect most other policy areas, social or economic, as well. Consequently, policymakers are dealing with a problem that exhibits many challenging characteristics.

Wicked problems have several implications for policymaking. Two overarching characteristics include unclear problem definitions, and unclear solutions that central actors agree to (Head & Alford, 2015, p. 714). Each wicked problem is unique, while at the same time, consisting of multiple issues in one (Head & Alford, 2015, p. 715). Thus, wicked problems are not just unclear in problem and solution formulation, but they are also greatly complex. This is very much the case for climate policy, and raises numerous challenges for policymakers both globally and nationally. Sometimes, climate change is even described as a "super wicked" problem (Lazarus, 2008, p. 1160). This complicates climate policy efforts even further. For instance, the longer it takes for us to deal with climate change, the more expensive it will be, both in economic and non-economic terms. Replacing the usage of fossil fuels cannot be done overnight, and the presence of divergent interests and short electoral cycles adds a problematic aspect for long-term changes, especially in liberal democracies that are highly dependent on carbon usage. Additionally, there will be other issues arising over the years that might take focus away from climate policies (Hovi, Sprinz, & Underdal, 2009, p. 23). If we are to lean on technological advances as a way to avoid the hardest decisions regarding costs and benefits for the time being, it also implies that this new technology needs to make up for what might amount to years of emissions. Furthermore, industrialized countries that, to a large degree, can be attributed most responsibility for historical emissions are not necessarily willing to take on responsibility. We lack good institutions to deal with climate change, both globally and nationally, and because of this, it is often difficult to "force" sovereign states to comply with international agreements or make efficient national policies (Lazarus, 2008, p. 1161).

Head and Alford (2015, p. 715) further highlight the divergent interests of stakeholders to be one important characteristic of wicked problems. This is especially an important explanatory factor for the lack of national climate policies and climate action. If stakeholders have conflicting interests or values, this can be a serious implication for how policy might be formulated, which may even have implications for whether the policy is adopted at all. While it can be argued that saving the planet is in the best interest of every living being on Earth, costs related to most climate change policies present themselves before the benefits. This makes decarbonization a difficult step to take for most actors with interests in economic growth which depend on fossil fuels or similar factors. Furthermore, even if stakeholders can agree that limiting the use of fossil fuels is the correct solution, a question of who should bear the cost of these changes arises. Additionally, sectors that depend heavily on fossil fuels often often have strong representation, and thus more power in decision-making processes. How power is distributed between these interests is central for policymaking. If more power is distributed to climate opposing stakeholders, they can overpower climate positive stakeholders even if they represent a smaller group (Alford & Head, 2017, p. 407). It is these two latter characteristics that are the main concern in this thesis. Exactly how labor organizations and institutional access can be effective for climate policymaking will be elaborated in the following sections.

Figure 3.1: Characteristics of wicked problems

Basic dimension	Causal categories	More detailed dimensions	Scale of wickedness
Problem itself (vertical dimension)	Inherent complexity	Contradictions/dilemmas etc	Contradictions/dilemmas present = more wicked
		Remedies causing problems	Remedies causing problems = more wicked
	Clarity of problem	Hidden/disguised information Intangible phenomena	Problem unclear = more wicked
	Clarity of solution	Multiple variables Iterative discovery ('Ready, fire, aim!')	Solution unclear = more wicked
Stakeholders and institutions (horizontal dimension)	Knowledge	Institutional framing	Extensive reframing → ↑ level of attention = more wicked
		Knowledge fragmentation	High knowledge-fragmentation = more wicked
	Interests	Interest differentiation/conflict	High interest differentiation/conflict = more wicked
	Power	Stakeholder power-resources	High stakeholder power resources = more wicked
		Enablers/constraints	More substantial enablers/constraints = more wicked

Source: Head and Alford (2017, p. 406)

3.2 Labor organizations, what are they and why are they of interest?

One important clarification to make before proceeding is exactly what kind of labor organizations that are of interest. The concept of labor organizations refers to both labor unions and employer organizations. In many systems of interest, both are important interest groups that are involved in policymaking processes. However, following the reflections from Cadman et al. (2017, p. 53) and Mildenberger (2020, p. 21), employer organizations are possibly of less importance to climate policymaking than labor unions. If employer organizations bargain more in line with their business interests than their members' interests as employers, they are less relevant to measures as labor organizations in connection with climate policymaking. At the same time, in countries with a high degree of corporatism, these organizations often negotiate with labor unions without much involvement from governments, and thus they might have an interesting placement in the policymaking process after all. Furthermore, although these more or less independent negotiations are concerned with issues such as wages or working hours, it is likely that employer organizations will also have opinions about climate policies because of their business values and interests. On the other hand, it is more unlikely that employer organizations are as concerned with the just transition rhetoric as labor unions. Business interests should instead be measured differently to capture those that are not connected to such labor organizations. Labor unions, as the representatives of employees, have more responsibility for work security on behalf of their members, and are most likely more involved in just transition rhetoric. Therefore, labor unions will be what I refer to as labor organizations in this thesis.

There are other interest groups besides labor organizations that could be of importance for climate change policies. Some of those which have been of focus in other studies are environmental NGOs and "green" political parties[1]. The characteristics of the first group differ from country to country, but usually they have in common, in one way or another, a desire to protect the environment (McBeath & Rosenberg, 2006, p. 60). They reflect more or less specific goals,

[1]The presence of green parties are included as a control variable, and is further discussed in chapter 4

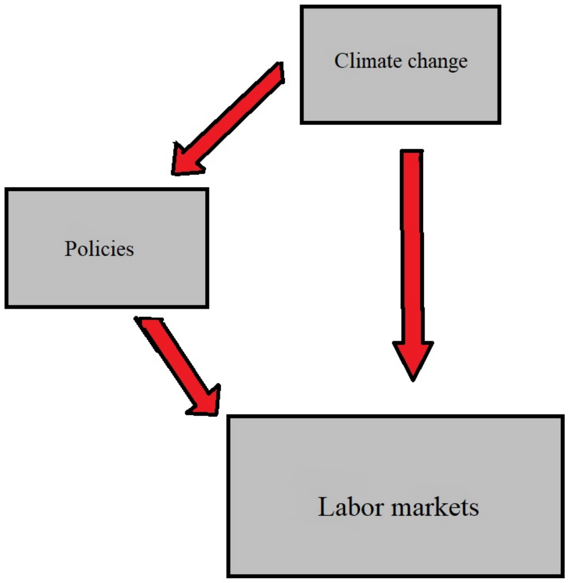
where some are highly concerned with one specific environmental issue, while others have more overarching and broad interests. Usually, environmental NGOs are not formally connected to the government. Thus, their influence depends on other factors such as membership size and scope (McBeath & Rosenberg, 2006, p. 61). The NGOs can also be of interest, especially because they can reflect the general public's feelings towards climate change policies. But as Offe (1981, p. 124) emphasizes, interest group studies often fail to focus on the institutions that provide the interest group with certain opportunities for influence, which he deems crucial for their relevance in policymaking. Also, labor organizations have been central interest groups in many OECD countries for years. These are both reasons for why labor organizations are of importance. Moreover, labor organizations are specific interest groups that, in some countries, have more formalized access to policymaking, while in others do not. This is an interesting difference that potentially has implications for the climate policies found in the different countries.

The so-called "jobs-versus-environment" dilemma, briefly mentioned in chapter 2, entails that the role labor plays in economic growth is inherently opposed to environmental concerns. While this dilemma's real importance has been contested (Silverman, 2006; Hyde & Vachon, 2018), it is likely that the dilemma's central position in climate policy concerns will increase in importance as climate policy becomes more stringent, due to more production being affected (Doerflinger & Pulignano, 2018, p. 384). A transition into a low-carbon economy is a necessary and important change that most scholars agree should take place (sooner rather than later) to combat at least some of the consequences of climate change. Such a transition will surely affect, and very likely completely change, production, especially in high-carbon sectors. In turn, this means that certain jobs are on the line and those who get to stay need to adapt to a new workplace situation (Felli, 2014, p. 372-373). Traditionally, high-carbon sectors have been deemed important for economic growth, which, in turn, have had unfavorable effects on the climate. However, because economic growth has been a major goal for governments, interest groups representing high-carbon sectors have remained of interest to government institutions.

New "green", or low-carbon sectors will certainly make gains from a transition to a low-carbon economy. Many new jobs will be created as this sector grows and it is likely that there might be a balance between loss and gain in cross-sector employment in the end. But the interests of the high-carbon sector are historically better represented and more organized. Consequently, they often have higher wages and better working conditions than the emerging low-carbon sector. While this might change in time, opportunities for "green" jobs are not necessarily sought after by workers in high-carbon sectors today. This difference in representation and condition might be due to how long the jobs have existed, but workers are not necessarily happy with accepting lower pay and perks in the short run in order to save the planet in the long run (Doerflinger & Pulignano, 2018, p. 386). Thus, labor organizations, especially those in the industry sector, might work as opponents to climate policy.

But, as presented in chapter 2, labor organizations also have the potential of being climate policy proponents. In addition to the examples of a more national nature, labor organizations started to propose plans for a just transition, at least in a work related matter, internationally in 2010. The International Trade Union Confederation (ITUC), as a representative for labor unions internationally, has attended climate negotiations and meetings since the beginning of the emergence of climate change as a policy issue in the 1990's. Their stance for climate policies have become stronger with time, even if their main interests center around workers' rights (Glynn et al., 2017, p. 54). Glynn et al. (2017, p. 152) further states that labor unions have succeeded in including their concerns for a just transition into international environmental agreements.

Figure 3.2: How climate change affects labor markets



Adapted from: Martinez-Fernandez et al. (2010, p. 9)

Additionally, many unions, including the international confederation, have incorporated climate change into their agenda. A focus brought to just transition and workers rights by labor unions simultaneously reveals that organized labor must have at least some influence on policymaking. It might be the case that labor unions have contributed to fewer climate policies due to the resulting slowing down of negotiations in order to incorporate concerns for a just transition. At the same time, it is possible that this more positive attitude from labor unions toward climate policies has led to more climate policies in total. No matter what direction the influence of labor unions points, there is clear evidence that there are a few, at least perceived, implications of climate change policy for labor markets. Labor unions have been important interest groups for work related policies, and evidence suggests that they will continue to have demands for climate policies that affect workers. The question is whether organized labor can influence and affect policymaking.

3.2.1 How labor organizations influence climate policymaking

In many developed countries, labor unions are powerful organizations, and they often have much to say when it comes to policymaking (Alvarez et al., 2019, p. 18). While they have been crucial for the development and implementation of many social and welfare policies, their relation and importance for climate policymaking has not been determined in a structural manner by previous research. Due to their importance for other issues, such as economic redistribution and welfare, it is natural to assume that these interest groups are able to keep earlier strategies in relation to other policy issues. Many of the international organizations centered around questions about the economy, e.g. OECD or the EU, find that labor organizations, both employers' organizations and labor unions, will play important roles in the development of climate change policies. Especially in terms of a transition to a low carbon economy. This is because the labor market will be greatly affected by climate change policies in terms of changes in mechanisms such as supply and demand (Martinez-Fernandez, Hinojosa, & Miranda, 2010, p. 13). As outlined in chapter

2 and section 3.2, labor unions might work as opponents or they might work as supporters of climate policies, but without any weighty strategy it is unlikely that they have any effect at all. Below, I outline the channels that labor organizations typically have worked through. These strategies can be related more directly to unions, for instance if the strategy revolves around strikes or collective bargaining. However, they can also be considered more indirect if the strategies relate mostly to institutions of interest representation or connections to political parties.

Labor union strategies

A first step towards theorizing exactly how labor organizations might influence policymaking is to look at the strategies that were important for the earlier social policies that unions have been relevant for. Culpepper and Regan (2014, p. 724) describe how labor unions in the past have been respected and "feared" by employers and policy makers, and thus included in the making of unpopular policies. Traditionally, they have exercised power by means of "sticks and carrots". In situations with more members, unions have been involved in the making of policies related to issues such as wage. Unions then become important actors for consensual welfare and social policies, and this is what characterizes the "carrot" strategies. Membership base is also relevant for the stick strategies, because strikes and protests are more hard hitting when there are many participants (Culpepper & Regan, 2014, p. 729). Having more members means that more workers are represented. Thus, when unions have more members, they have larger groups supporting them while negotiations or various forms take place. Having more members is helpful either for formal negotiations, strikes or demonstrations and has been the preferred strategy. This is because the unions in question then have more supporters, which, in turn, translates to more power. Traditional strategies of unions have been, in fact, the mobilization of workers on the basis of the logic of "the more, the merrier" and "together we are stronger".

Because of the declining membership base (discussed below), and because of loosening ties to political parties and government, Culpepper and Regan (2014) claim that unions have lost much of their bargaining power in many countries. Also Becher and Pontusson (2011, p. 206) argue that labor organizations typically influence policymaking through two channels, and refer to these as corporatist bargaining and electoral politics. Although there have been times when labor unions have been more closely connected to political parties, especially social democratic parties, these trends are not as present in the later years. Allern, Aylott and Christiansen (2007) argue that the reason might be that political parties have seen the need to widen their voter base, and wanted to shift away from obvious connections to specific interest groups. Thus, labor unions are perhaps now seen as just one out of many interest groups instead. Culpepper and Regan (2014, p. 742) argue that this loosening of political ties is also the case in corporatist countries where the positions of unions are overall more institutionalized than in countries with less corporatist systems (Culpepper & Regan, 2014, p. 742). For this thesis, the corporatist bargaining is the more central component for analysis. This is because it, to a larger degree, can explain various climate actions, compared to just the presence of political parties that also have connections to unions. The more detailed characteristics and implications of corporatism systems will be outlined in a later section.

Implications of declining union membership for influence

Overall, there is a decline in union density in most industrialized countries. This widely acknowledged decline in the share of workers who maintain a union membership has certain implications for the mechanisms outlined in this chapter so far. First of all, there exists different explanations for what might cause this decline. One major explanation is the shift of workers in different sectors. Checchi and Visser (2005) suggest that unions in industrialized economies were unable to keep up with the expansion of the service sectors after the 1980's. Moreover, there has been a shift from total employment from public sectors to private sectors. Traditionally, public sector workers have been better organized, which could partly explain this dynamic in the data. Another possible driver for the decline in membership is the shift to "a-typical" employment situations, such as an increase in temporary or part-time employment. These workers are typically less unionized, perhaps because they are more dependent on being on an employers' "good side" and have less secure employment situations in total (Ebbinghaus & Visser, 1999; Pontusson, 2013). The shift away from the clear association between corporatist institutions and redistributional policies, might also be connected to this loss in bargaining power, as corporatist systems often have had higher union density as well (although there are some exceptions to this) (Becher & Pontusson, 2011, p. 206-207).

Simultaneously, as scholars focus on the above mentioned shift in employment, some have argued that the decline in union membership in OECD countries might be due to a "de-industrialization". Not only are public sector employees better organized, but historically industrial and manufacturing workers have been better organized than those in service sectors. Many low-carbon jobs are found in service sectors, as mentioned previously, which means that there might exist a connection between these two reasons. Pontusson (2013, p. 802) looks at an earlier version[2] of the Visser (2019) database, and what he finds still holds in the updated version. It is evident that it is, in fact, the industrially related sectors that have experienced the most steady decline in density of union membership. However, workers in manufacturing are still the workers that constitute the largest part of union members as a whole in all OECD countries. This means that labor unions might be considered more likely to be climate policy opponents, according to the theoretical assumptions about mainly economically related interests. To what sectors the unionized workers belong is of interest because the decline in overall union density might be caused by the increasing presence of other sectors. As discussed above, the possible relationship between union density and the amount of climate policies in a country will to a degree depend on who it is that constitutes the largest part of them. Additionally, if this is the case then the decline in membership will be of less importance for the mechanisms behind their possible influence on climate policymaking because the most central workers of unions have not changed substantially throughout the time period of my sample. Furthermore, there might be other factors than just the size of unions that affect their possible influence on policymaking. Thus, union strategies and institutions that might facilitate unions' influence are discussed in the following sections.

Institutional access

Besides the potential ties to political parties, the influence of labor unions has been theorized to also be dependent on the characteristics of corporatist bargaining and general interest representation. McBeath and Rosenberg (2006, p. 45) state that there are different systems of how interest organizations are positioned in terms of involvement with the state and policymaking. As a very broad first introduction, they map out pluralism[3], where groups are free to organize

[2] From 2013

[3] Pluralism is considered a less defined concept than corporatism in a large part of related studies, and many scholars choose to refer to "pluralist" systems as "less corporatist". This is a discussion that I give little attention because my focus is on the mechanisms of more or less corporatism, but might be a useful clarification when reading the relevant literature. Schmitter (1974) was one of the first scholars to reinstate the concept of corporatism as the opposite of pluralism, which at the time was a more widely used concept in scholarly work. He

and are found side by side with the state, and corporatism, where the state organizes groups and acts as a mediator between different interests. Even though there are many different clarifications and extensions of the concept of corporatism beyond this which circulate in scholarly work (Jahn, 2016, p. 50-51), most of them are variants of this broader definition. However, in order to explore what it is with corporatist systems that might be associated with more or less climate policies, it is important to dive a bit deeper into the concept.

Interest representation in corporatist systems typically consists of a smaller number of actors, often from capital and sometimes from labor, organized in peak associations that represent the broader membership base of these sectors (McBeath & Rosenberg, 2006, p. 46). In other words, there are certain organizations that, in a sense, get the responsibility of representing a larger societal group or interest. These actors are provided access to policymaking, almost by default, and do not have to fight for their voice to be heard to the same extent as in less corporatist systems. The latter type of interest representation system is instead characterized by many smaller interest groups that compete to influence national policymaking (McBeath & Rosenberg, 2006, p. 47). Thus, in more corporatist systems, other traditional union strategies might be less necessary because of a stronger position to begin with, or they might have amplifying effects. How worker and employer relations are organized varies, even between similar liberal democracies, and likely affects the position of the groups in relation to other interests. A division is often set between a more decentralized relation to industry, as seen in the United States, and the more centralized and cooperative structures of institutions in Northern Europe. The latter is mostly associated with corporatism of countries such as the Scandinavian countries, and Belgium or the Netherlands. Western (1991, p. 283) uses a definition of the concept of corporatism that revolves around arrangements where "peak representatives of business and labor negotiate wage and price agreements at national level". Western (1991), and others, argue that power is inherent in the system and makes labor representatives powerful actors through these corporatist institutions. This characteristic of corporatism as a system of special interest representation is what constitutes the structural part of Jahn's (2016, p. 51) conceptual understanding of corporatism. The main concern is thus whether centralization has a more or less hierarchical nature.

Another important characteristic of corporatism is how much the government intervenes in negotiations between the main groups, especially those that are economically related. Or, in more general terms, what the function of the state is in relation to the central interest groups. For instance, in countries like Sweden and Austria, centralized bargaining can happen between employers and workers directly without involvement of the state (Western, 1991, p. 284). This monopoly that is given to business and labor, as well as the close connection between these groups and government is one part of one of the components that Gronow et al. (2019) call strong tripartite organization, and they find that it is a potential source for weaker environmental performance. For definitions that focus more on tripartism, where labor, capital and the state are the driving actors, the government is important for implementation of economic policy and social services, but the actual formulation might to a larger degree happen between central groups determined by those mentioned in the structural part of the concept. While this is currently not associated with climate change policies, it does highlight the special importance of labor organizations in corporatist systems. Labor organizations have a unique position to formulate specific policies, that, on one hand, can mean that they incorporate climate change

found it useful to think of corporatism as a system of interest representation, and considered them ideal-typical institutional arrangements that linked the organized interest of civil society to the decisional structures of the state (p. 86). Thus, pluralist systems could be considered more competitive, and corporatist systems more inclusive (Vabo, Klausen, & Askim, 2020) concerns into their work and economy related policies, and, on the other hand, might give them the opportunity to clearly oppose and threaten the adoption of other climate related policies. This constitutes the function of corporatist systems, and also highlights the potentially mediating dynamic of the systems (Jahn, 2016, p. 51-52).

The last part of Jahn's (2016) conceptual understanding of corporatism, is related to how the output of the systems translates to the rest of society. To a degree, this part is not what constitutes the most interesting mechanisms for analysis in this thesis, but is simultaneously a central part of the concept. The scope of corporatist systems is thus concerned with how the agreements that are agreed upon through the structural and functional part that I outlined above relate to organizations beyond those included in formulation and adoption. Corporatist systems vary in how comprehensive they are in broader economic and social terms. For instance, some countries require by law that agreements on wage levels that were made between labor unions and employers apply to all of society (Jahn, 2016, p. 52). In this case labor organizations might also have more power in climate change issues, because the outputs of the negotiations within the corporatist system are often applied beyond specific sectors.

There might be an individual effect of corporatism on climate change policy, as suggested by the scholars who have studied the effect on environmental policies and performance (Scruggs, 1999, 2001; Crepaz, 1995; Gronow et al., 2019). However, scholars such as Western (1991, p. 286) argue that the amount of corporatism in a country will vary alongside the size of the labor force and union membership. Hence, certain interests, like capital and labor, advance through the building of, for instance, corporatist institutions. His argument is that interests alone usually do not matter, and these interests cannot guarantee the cooperation needed for a corporatist system to develop. But, when corporatist institutions are developed, that is when these interests become central. Thus, while union density and corporatism might correlate in terms of interest group strength, they likewise can account for different developments separate from each other.

3.3 Distributive conflict theory

Distributive conflict theory is used to describe how policies that create winners and losers, or have distributive characteristics, are affected by conflicting interests. How the power of these interests affects the content and adoption of said policy is at the center of what determine the outcome. Scholars from this theory are concerned with how institutions and policymaking differ between countries (Finnegan, 2019), and the power balance of interest groups (Stokes, 2020; Mildenberger, 2020, 2015; Aklin & Urpelainen, 2013). The focus lies with how power imbalances between those opposed to and in favor of climate policies are moderated by institutions. The core of this theory is that countries take action when interests that are pro-climate are powerful enough to overpower opponents (Aklin & Mildenberger, 2020, p. 11).

Distributive conflict raises questions of economic and social "winners and losers", and is often associated with traditional economic conflicts between groups such as employers and employees, or labor organizations and government (Paloheimo, 1984, p. 17). In general, whether costs and benefits for different societal groups are concentrated or scattered is of great importance for how policies are worked out (J. Q. Wilson, 1973, p. 308). For instance, if benefits are widely distributed while costs remain concentrated to one or a few specific groups, there exists room for more conflicts around the policy in question (J. Q. Wilson, 1973, p. 334). Some current economically privileged groups are facing threats against their strong financial security in many developed countries. They face being imposed with costs. These costs stem in part from redistribution related to climate issues and belonging policies, as well as policy suggestions. For instance, groups with vested interests in fossil fuels, or other carbon-intensive sectors, have material reasons to oppose climate policies. Other groups might have economic interests in renewable energy or low-carbon activity, and thus do not face these same costs (Aklin & Mildenberger, 2020, p. 10). This is likely to impact their view on the climate policy in question, and, depending on their influence, on policymaking where it might affect whether the policy ends up adopted or not.

Because the workers that are historically most organized are found in various high-carbon groups (Pontusson, 2013), and the jobs of these workers could be on the line if certain climate policies are adopted, their unions might be one of the opponents to climate policy adoption. Some studies on climate change as a distributive conflict issue focus on the importance of special interests, like labor, and the control these might have in the policy-making process. The composition of opponents and proponents is theorized to have an effect for the climate policy outcome[4]. For instance, if there is a high proportion of groups that benefit economically from renewable energy, and a low proportion of groups that benefit from fossil energy, then it is more likely that the climate policy outcome will facilitate the first group. Different interest groups will push for different climate policies depending on how it fits their carbon dependence. Studies that have a focus on this also underline how different institutions can give more authority to certain interest groups and not to others (Aklin & Mildenberger, 2020, p. 11). Thus, exploring both central interest groups and the institutions they work through is important when trying to determine if there is a relationship between these concerns and climate policymaking.

Interest groups have the potential to both boost and avert distributive conflict because they advocate the interests of their members. Depending on what these interests are, they might shift the support for a specific climate policy one way or another[5] (Olson, 1982). But although everyone will benefit from a healthy planet, more specific and immediate benefits are often needed if a strong organization of coalitions *in favor of* policy change is to form (McBeath & Rosenberg, 2006, p. 108). This is because immediate costs are a bigger concern for many interest groups, and might weigh heavier for them than diffuse or unclear benefits that will appear far into the future. As mentioned, certain interest groups are more likely to be inflicted with immediate costs when they face efforts to decarbonize the economy. If these groups are big, or have strong representation in policymaking processes, they can more efficiently stall efforts to create decarbonization policies. Within this understanding of climate policymaking is also where it is natural to place the issues of labor organizations, especially for those that protect the jobs and rights of workers in exposed sectors. Groups in this position will have a strong incentive to organize in order to reduce or keep the current level of costs (J. Q. Wilson, 1973, p. 334). Labor organizations have a clear benefit; they are already organized and their goal of securing the interests of their members is constituted.

Exactly which interest organizations are of most importance is determined in part by their size (Paloheimo, 1984, p. 21). All groups need to consider the consequences their interests might have for the greater society, but smaller groups often deal with a smaller part of the costs that their policy preferences might lead to. Larger groups, on the other hand, have more incentives to find solutions where the costs for society in general will be reduced, because they know that

[4]Some studies also focus on policy networks, or cross-class coalitions. If a government official have strong connections to oil businesses, then this group might have better representation than renewable energy business, and vice versa

[5]Simultaneously the share diversity of interests alone can contribute to slowing down development in politics. The more interest groups there are in a society, the longer it takes to reach consensus which in turn enhances a wider distributive conflict between different interests

it is unlikely that a policy which is disadvantageous for most people will be adopted (Paloheimo, 1984, p. 22). Big interest groups are therefore more connected to society as a whole. When focusing on labor organizations and climate policies this is particularly interesting. If this is true, then larger and more encompassing labor unions might accept climate policies that are somewhat "worse" for their interests because of the social costs of not accepting them. As suggested by Räthzel and Uzzel (2011), unions are liable to accept certain concessions as long as jobs are secured. Thus, if a climate policy is opposite to their interests to some degree, but jobs stay secure, bigger labor unions might accept the policy anyways. This implies that even if labor unions are more likely to "block" climate policies, there are instances where they might accept them even though they are not completely aligned with their interests.

Interest groups within different countries do not necessarily have the same capability or methods of affecting climate outcomes as each other. Within countries' respective national systems, which in turn generate their national policies, there are different types of interests that compete. Characteristics of national policymaking systems differ between countries that, in many other aspects, are similar, and so does interest group composition and representation. For instance, different interest groups such as labor organizations, environmentalist groups, business and industry, or politicians and political parties have different meanings for climate policies in different political systems (McBeath & Rosenberg, 2006, p. 106). In certain countries, labor organizations have perhaps never been very central because they have had different ways of managing their typical concerns. In other countries, labor organizations may have been crucial for the development of workers' rights, and have stayed central groups to this day[6]. The relationship between labor organizations and climate policies might not be the same in all countries in the sample, but the distributive conflict theory theorizes that it is a relationship that can be identified in most industrialized countries.

An important part of distributive conflict, beyond the characteristics of the interest groups themselves, is the implications of institutions that facilitate policy opposing or supporting interest groups with a place in the negotiation. How power is distributed in institutional and legislative processes decides which interest groups get a say, and also affects the adoption stage of the policymaking process (McBeath & Rosenberg, 2006, p. 109). This is a policymaking mechanism that is specifically of interest for the research question of this thesis. Political institutions can modify or change the way interests, political parties, and other movements or counter-movements organize and are structured. When studying climate change and policymaking in relation to organized labor, it is relevant to examine how power is distributed. Whether it is concentrated or dispersed is likely to have an effect on what comes out of the policymaking process (McBeath & Rosenberg, 2006, p 110-111). Although values and interests might be important for the underlying motives of those who care about the climate and the environment, it is political institutions that structure these values and turn them into policies through organization. This is the essence of what makes institutions an important explanatory path for climate change policymaking (McBeath & Rosenberg, 2006, p. 112). The composition of interest groups and institutions varies between OECD countries and, over time, affects the variety of distributional climate policy. The power balance between different interests and coalitions, mediated by institutions, can explain parts of the issue with climate policymaking (Aklin & Mildenberger, 2020, p. 11).

As outlined above domestic climate policymaking can be well described as a distributive conflict

[6]In all of OECD, the numbers of workers who are organized have decreased. This do not change the fact that unions could have stayed important groups despite declining memberships

issue. This is especially because of the redistributive nature of most climate policies, and the climate change issue itself. Thus, interest groups, their composition, and the institutions that enable or prevent their access to policymaking are the most central factors when explaining differences in climate policy outcomes. Furthermore, this theory is well suited for trying to explain specifically domestic climate policymaking, and moreover, these power compositions are perhaps the most central in developed economies, such as the OECD member countries. Besides, these are the types of countries where distributive conflict, at least between economic actors such as labor unions and employers organizations, are usually the most explicit. Moreover, countries with stable economies and borders tend to have more interest organizations, even though certain interests are often better represented than others (Paloheimo, 1984, p. 22). This is exactly what might affect the number of climate policies that end up being adopted in these countries. On an ending note, it might seem like policies in this category are never adopted, but that is obviously not the case. Climate policies are also adopted, even if the road towards adoption is a difficult one.

As stated in chapter 2, corporatist institutions might be more favourable for regulation of environmentally harmful production than less corporatist ones. The government in these systems often inherit the ability to use regulation more directly. Furthermore, monitoring regulation is more common and easier because of historical trust between the government and producer interest groups. After all, the producer interests are often included in bargaining and to a large degree have a say in policy outcomes. This makes the regulation of environmentally harmful production less unheard of, as producers, in a larger sense, trust that the government will help them out if they are imposed with costs (McBeath & Rosenberg, 2006, p. 47). In other words, welfare and redistributional policies are of great importance for exposed groups, such as labor unions that face a reduction in work security. Even if the association between corporatist systems and redistributional policies are weaker today than they have been, it might still be higher in these systems. Moreover, public goods might be more easily pursued in corporatist systems due to the centralization of interests. Better strategies for compensation often exist, and producers are often more involved and devoted to mitigate the effects of climate change (McBeath & Rosenberg, 2006, p. 48). This might help limit the distributional conflict of climate change. Additionally, Paloheimo (1984, p. 23.24) argues that corporatist institutions help build consensus in policymaking due to involvement of big interest groups, and thus these institutions have the potential to limit distributional conflict even further.

But, even though many of these characteristics are present in corporatist systems, other problems might arise. Aklin and Mildenberger (2020, p. 2) paint a picture of climate change policy as primarily a distributive problem, driven by distributional conflict within industrialized countries. What is seen as important is the meaning of interest control for climate policymaking, and the power of these groups (Aklin & Mildenberger, 2020, p. 10). Mildenberger (2020) goes further in studying these dynamics and develops a theory of "double representation". One of the most important components of his theory is how certain corporatist states have enabled strong unions of carbon-dependent industries to get a powerful seat at the "policymaking table". Because big changes in the status quo of climate policy action means that many industrial jobs are in danger, these unions oppose meaningful climate policies. Due to their powerful position, they are mostly successful at doing so in corporatist systems (Mildenberger, 2020, p. 40). Yet, Mildenberger (2020) also states that corporatist systems make climate policy outcomes less conflicted, because the form these policy suggestions often end up as are less focused on producer-cost, which again is caused by the powerful position of interest groups such as industrial labor unions and businesses. Thus, corporatist systems might have more climate policies than pluralist systems, although they are less stringent. Finnegan (2019, p. 34-35) finds some of the same mechanisms when he explores the importance of institutions, namely corporatism and electoral systems. Thus, even when corporatist systems themselves are in some sense favourable for climate policies in terms of the amount of policies, this depends on whether the tripartite organizations are strong and embedded in industry. Corporatist systems with larger unions might have more climate policies, but these climate policies might be of a less intrusive nature. While this dynamic is of great interest, it is beyond the scope of this thesis. I am only able to find associations with the amount of climate policies, but this is still an interesting addition to the findings of the mentioned scholars.

3.4 Hypotheses

Based on the previous sections, I have outlined that climate change is a distributive issue. From this point of view, interest groups in general, and certain interest groups in particular, are theorized to have an important place in climate policymaking and adoption based on the distributive nature of particular policies. One interest group that is of interest is labor unions. This particular group has been suggested to be influential in both negative and positive ways. On a negative note, labor unions have been seen as advocates for economic growth, and protectors of fossil fuel industries. This would entail that they possibly lead to fewer climate policies. On a positive note, there have been many examples of labor unions who, to a larger degree, are invested in public goods and have incorporated climate change concerns into their agendas. That would more likely lead to more climate policies, as they are no longer seen as an obstacle. Hence, the first hypotheses are:

H_1: There exists a relationship between labor union density and the amount of newly adopted climate policies

H_{1a}: Labor union density is negatively correlated with the amount of newly adopted climate policies

H_{1b}: Labor union density is positively correlated with the amount of newly adopted climate policies

Institutions matter. As such, corporatism in particular should be of importance for climate policymaking. Because a few central interests are included through these systems, as opposed to systems where interests nearly have to fight for a saying, I expect the policymaking of corporatist systems to be more efficient. According to the theory, corporatist systems should also mediate distributional conflict, which potentially leads to more climate policies. But this potential effect of corporatism on climate policymaking will likely depend on the types of interests that are involved. If the case is, as it might be, that the included interests are climate policy opponents, then a different dynamic comes into play. Thus, my final hypothesis is as follows:

H_2: The relationship between labor union density and the amount of yearly adopted climate policies depends on the level of corporatism

Chapter 4

Data and operationalizations

In this chapter, I present the data used in the analysis along with the operationalizations of the different variables. These variables measure the theoretical concepts presented earlier in the thesis. Along with the operationalizations, I will also present the sources that the variables are derived from. The data is gathered from various sources, and followingly it has gone through some technical fixes within the statistical software used, R and Rstudio, upon merging. Thus, I will also account for how the data has been adapted to the panel data structure that enables the statistical models presented in chapter 6. This is discussed in order to illuminate where any potential mistakes made in the coding process could lie, and to improve the reader's understanding in order to help with interpretation of the results.

4.1 Data

The dataset utilized in this thesis contains data from all OECD countries from 1990 to 2018, and is an unbalanced panel dataset[1]. The different variables are sourced from more than 10 different datasets. Each source is specified together with the operationalization of each variable. In total, the dataset has 1073 rows of observations, but there are many missing observations for some of the control variables that limit the actual sample further. Thus, there are fewer observations used in the regression models than what could have been possible with a balanced dataset[2]. This potentially limits the scope of the analysis, and is further discussed in chapter 5 alongside the methodological challenges of the thesis. Having both cross-sectional and time series data in one dataset increases the variation, because one gets to see differences between countries and between periods of time. Each unit of analysis is a country-year, for countries that are currently members of the OECD.

The reason for limiting the sample to OECD countries is due to both conceptual reasons and a matter of data availability. First, labor organizations have been of more importance for the development within industrialized countries than in most other places. This makes the OECD a fitting sample of countries, as labor organizations in other parts of the world might be less relevant explanatory factors for how many climate policies a country adopts. Moreover, the comparability between the countries in the sample is increased because the OECD countries are overall similar in their level of development and various economic factors. Potential noise in the data, e.g. violent conflicts or very unstable political institutions are less of an issue due to these

[1]The full dataset, as well as the R-scripts from constructing it, can be found via the GitHub-link provided in the acknowledgements

[2]If the dataset had observations for all countries over the full time periods, this would be the case. However, it is quite rare when using observational data in the social sciences

similarities. Mildenberger (2020), for instance, highlights that the role of business is very similar across industrialized countries, which makes labor organizations a potentially more interesting explanatory factor. This is specifically true for OECD countries. The OECD countries differ in the amount of annually adopted climate policies, as well as in the density of organized labor and their systems of interest group representation. Because of this, possible systematic trends in the data might become more clear, as there are less other available explanations for the differences. One should still be careful making too rigorous claims about causality (see chapter 5 for a discussion on this), but results can, at the very least, uncover systematic trends in data that, to a larger degree, can be detected for this specific sample than others. Lastly, data about OECD countries is easily available compared to data about other countries, a fact that the sample choice is also driven by.

Much of the raw data that is included in the final dataset goes as far back as 1960, but in the main analysis I only use data starting from 1990. This is because climate change did not become an important policy issue before this time, and including data from further back could potentially highlight other policymaking mechanisms other than those of interest. Although climate change was known to scientists long before this (see section 3.1), it was first at the UN Earth Summit[3] in Rio de Janeiro in 1992 that global climate change first reached the international policy agenda. It led to the formulation of the UNFCCC[4] where the UN member states first acknowledged climate change caused by human activity, and stated that industrialized nations should take responsibility (United Nations, n.d.; FRANCE 24, 2015). In addition, there are more missing observations before 1990, and therefore the difference between the different statistical models is not big when including the full dataset. This is due to listwise deletion, which is the default in R. Some variables have data that is updated to 2020, but because the union density and corporatism variables only include data up until 2018, these have not been included. For some additional models where the independent variables are lagged, the dependent variable is included with data up until 2020. The results of these can be seen in appendix C. The ICTWSS (2019) database moved to OECD/AIAS in 2021[5], but this update happened too close to the deadline of this thesis to be included in the analysis. Thus, the potential for an analysis updated with at least two years is possible as of May 2021.

4.2 Operationalizations

It is important that the variables that are used in the analysis measure what they are supposed to measure. This is what Adcock and Collier (2001, p. 531) refer to as measurement validity, ranging from the theoretical concept on one side to the specific indicators and scores on the other side. In this section, I describe how I have chosen to measure the different theoretical concepts from chapter 3. Operationalization can sometimes be tricky, because the real world is usually more complex than seemingly clean theoretical concepts. For instance, scholars do not always agree exactly as to what a "corporatist system" is (see e.g. Gronow et al. (2019) for a discussion on this). There might be certain aspects that many of the definitions have in common, but scholars often end up exploring different parts of the theoretical concept. This is perhaps some of the reason behind the diverging results highlighted in the previous chapters. While I do not strive to settle one correct definition of corporatism for all, it is important to describe and justify the operationalization that I end up with. The operationalization I choose is thus something to have in mind when interpreting the results. It is crucial that the indicators utilized convincingly

[3]More formally named *The United Nations Conference on Environment and Development (UNCED)*
[4]The United Nations Framework Convention on Climate Change
[5]It can be found through the following link: https://www.oecd.org/employment/ictwss-database.htm

cover the theoretical aspects, in order to ensure that what I claim to measure is, in fact, what I do measure.

4.2.1 Dependent variable - climate policies

As discussed in section 2.3, climate policies are the most natural focus point of this thesis because they are the outcome of the climate policymaking processes of interest. Depending on the nature of labor organizations' interests, and their access to policymaking through institutions and size, the amount of adopted climate policies might be affected. Thus, climate policies are operationalized as the number of newly adopted climate policies per country-year. The data comes from the Climate Change Laws of the World database (2021), which is a comprehensive database that strives to cover all climate laws worldwide. Currently it covers laws and policies that were adopted between 1947 and 2020 for all UN parties, as well as a few territories that are not recognized as countries by the UN, such as Palestine and Taiwan.

The database seeks to use a flexible measure of "laws". In the documentation of the methodology behind the data collection, it is evident that laws are considered legal documents approved by legislative authorities, and that policies are considered legal documents approved by the executive part of the government. In some cases, there is no clear division, and in those cases the definition is given based on the coders' understanding of the legal system within the specific country. While the original dataset distinguishes between laws resulting from legislative acts, and policies resulting from executive provisions, I have chosen to treat all these observations as subject to the same outlined mechanisms of distributive conflict. Laws and policies are often subject to the same distributive conflict, and both are of interest for a policymaking process. Moreover, this definition is justified by a consideration of the many different cultures and institutions in different countries, meaning that a law in one country could potentially be perceived as a policy in another. It is outside of the scope of this thesis to take into account the different national definitions of policies and laws. Additionally, this operationalization limits the loss of observations. Also, other scholars have indeed used this exact dataset to measure climate policies (e.g. Schmidt & Fleig (2018)), which further secures the relevance of this operationalization.

One possible drawback of this measure is the broad notion of climate change that is used in the original data collection. Obvious inclusions are policies that have to do with energy demand, promoting low carbon energy and buildings, carbon pricing and reducing emissions from industry. Less relevant policies, at least for this thesis' theoretical assumptions, are those concerning deforestation, land use, and mitigation efforts. On the other hand, it is claimed that these more general environmental policies are included only when they have an explicit climate change focus (Schmidt & Fleig, 2018, p. 179). Thus, the possibility of capturing other phenomenons than what is strictly of interest arises. However, because these nuances are sometimes difficult to distinguish in the original data, I have chosen to include all. Moreover, most of the less relevant policies are found in data from before 1990. For instance, Israel is coded with one climate policy in 1960. A closer look into which specific policy this is shows that it is described as a water management law. Firstly, this law could be perceived more as an environmental policy than a climate policy. Secondly, it was most likely not thought of as a climate policy at the time, because climate change was not a coined term then in the same way as it is now. This means that most likely it was not subject to the same distributive conflicts as many newer policies that relate to issues such as decarbonizing. These occurrences are less frequent in the data after 1990.

A great benefit of this operationalization of climate policies, is that what is analyzed is, in

Table 4.1: Frequency of newly adopted policies per country-year, 1990-2018

	Count of newly adopted policies
0	742
1	207
2	80
3	25
4	9
5	6
6	3
8	1

fact, policies that have been through some sort of policymaking process. Other studies on e.g. corporatism and environment have often looked at the effect labor organizations and institutions have on GHG or CO2 emissions levels (e.g. Scruggs (1999, 2001) or Hyde and Vachon (2018)). Because the occurrence of a new policy is one of two obvious outcomes, i.e. policy or no policy, of policymaking processes, it makes more sense. Thus, this operationalization of the dependent variable provides a useful understanding of the way labor organizations and institutions might affect climate policymaking. Although some studies (see for instance Eskander & Fankhauser (2020)) find that climate policies do reduce GHG emissions, many factors other than the characteristics of a policymaking process might affect these emissions. By focusing on the amount of adopted policies, I can more securely say something about the mechanisms of interest.

As mentioned, the original dataset is structured as event-data. This means that all rows contain information about one climate change related policy from a country for the relevant year. I have constructed a count variable so that my dataset also includes cases of 0 policies per country in a given year. The count variable measures every time one or more new policies appears in the original data, and is grouped by country. Some coding was required in order to obtain a proper count variable, which shows the number of newly adopted climate policies for a given country-year. This turns the original data into a panel data structure, where each unit of analysis is a country-year. The dataset made for this thesis contains only the OECD countries. After filtering the correct countries, I was left with 903 policies. In total this gives 797 observations with one or more newly adopted climate policies, as some years contain the adoption of multiple policies. Table 4.1 presents the frequency of different counts of the dependent variable, while figure 4.1 shows the counts per country across the years included in the sample.

4.2.2 Independent variable - labor union size

As discussed in chapter 3, I focus mainly on the employee side of labor organizations. Union density is thus used as a measure of labor organization size. In addition to this conceptual differentiation of labor organizations, one reason for the clarification is that I have not come across good data available for measuring employers organizations. If this had not been the case, I would be able to also test this side of labor relations and climate policymaking. Thus, the specification is again both conceptual and concerns data availability and quality. The ICTWSS database (2019) contains one variable called employer union density. This could be a good example of such data had it contained more observations. Currently, there are less than 200 observations in total, making it less likely to uncover any general trends that could be generalized for all OECD members. Therefore, I make a conceptual choice where I assume that employers' organizations place themselves in line with business interests (see section 3.2 for a discussion).

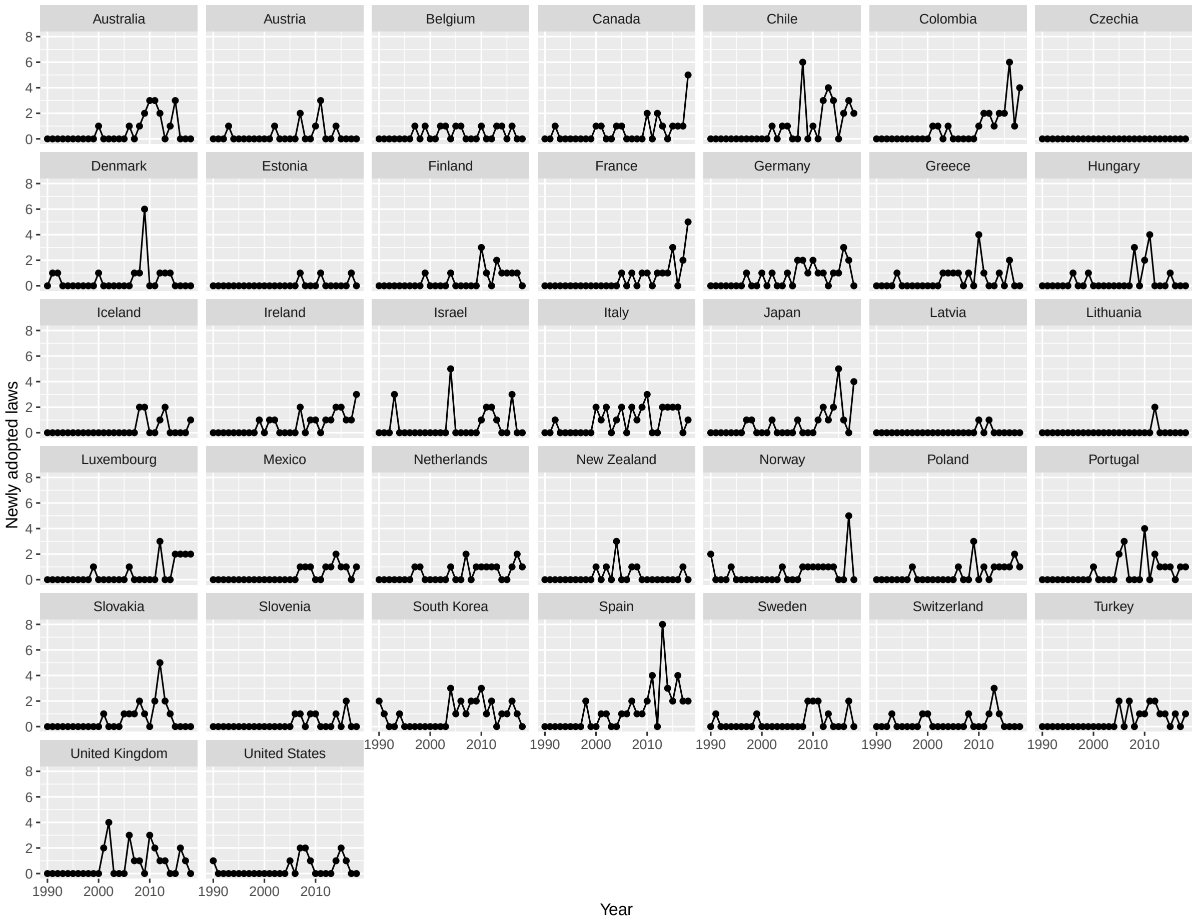


Figure 4.1: Newly adopted climate policies per country, 1990-2018

Regression results of models where I have used the employer organization density variable, as well as the countries and years that are included in this, can be seen in appendix D.

Labor union density, or unionized employees as a percentage of all employed people, has often been utilized as a measure of labor union strength. This is because having more members is assumed to lead to more influence (Pontusson, 2013; Ebbinghaus & Visser, 1999). However, union strength does not only involve the size of unions' membership base. A big union without access to policymaking, for instance through corporatist systems, is not necessarily more influential than a smaller union that has this access. Nevertheless, it is likely that the size of unions' membership base makes up an important part of the strength of unions that has implications for a potential effect on climate policymaking. Labor union density thus captures only one part, although an important part, of the concept of union strength. For this thesis, I refer to this factor primarily as a measure of the size of labor unions. Other factors that might contribute to their strength is captured with the corporatism index presented in section 4.2.3.

This data is downloaded from the ICTWSS/Visser (2019) database, and originally contains information for all OECD and EU countries from 1960 to 2018. The original data also includes a few non-OECD and non-EU countries, such as Argentina, Russia and China. My dataset, as mentioned, includes only the OECD countries. Some of the OECD countries had missing observations for a few years which, to some degree, has been substituted from ILOstat (2021).

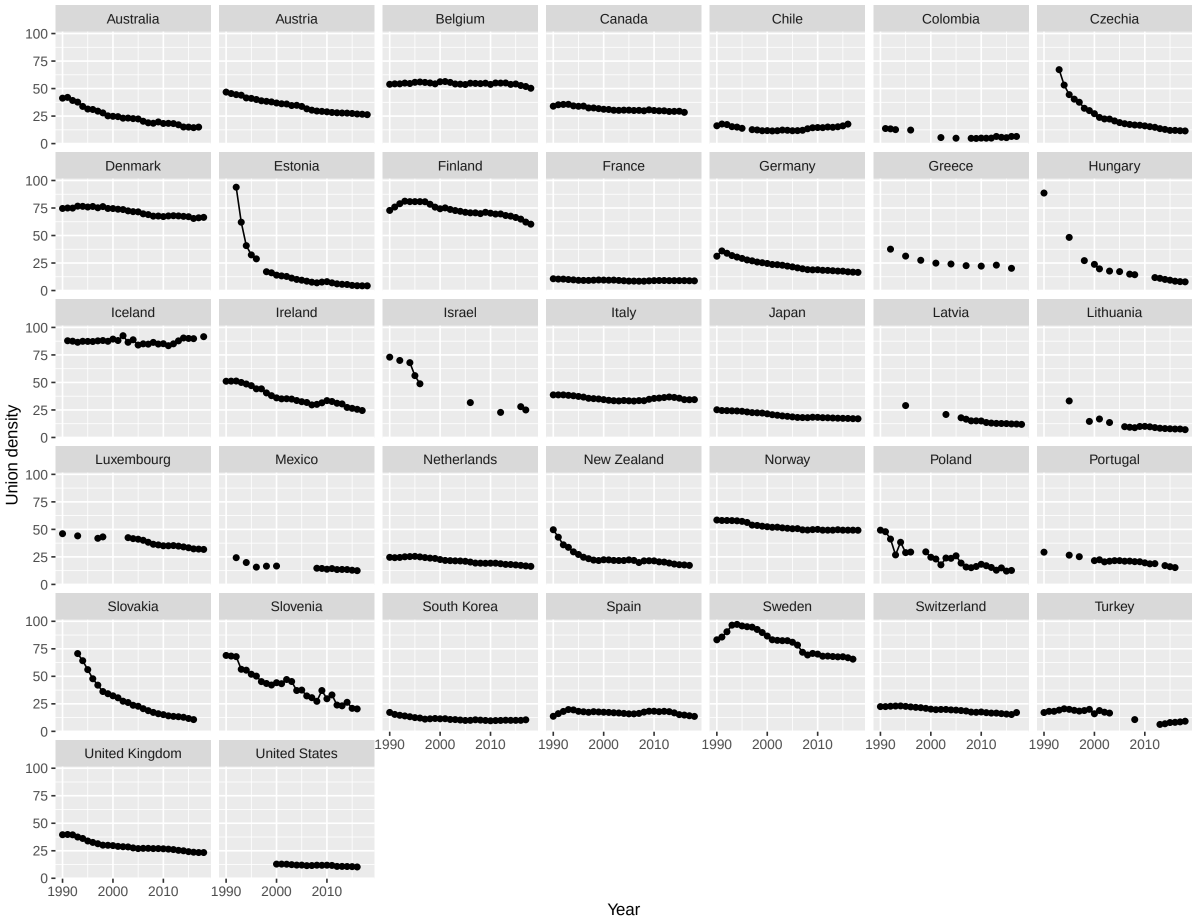


Figure 4.2: Union density per country, 1990-2018

The data from Visser (2019) is kept for the observations where it is available because of the widespread use of this dataset in studies on labor unions, but observations that were available from ILOstat have substituted some of the missing observations. Some of this data was contained from surveys, and some from administrative sources, which means that there might exist some differences in how the data has been obtained. However, the general levels of union density seem to be strongly correlated between both sources, indicating that the measure is consistent across the sources.

Figure 4.2 contains information about the levels of union density for all the countries in the sample. For some countries the decrease has been steep, while other countries have seen more stable changes in the share of workers with union membership. Disregarding the general decrease, it is evident from the figure that some countries have higher levels of union density, and others have almost non-existent membership numbers. Which countries have these levels is quite stable across time, but there are some differences. Countries that previous to the beginning of the sample were part of the Soviet Union, and experienced some instability in the overall institutions within the country, such as Estonia, have seen more drastic changes. Because the union density variable is measured as percentage, the possible values reach from 0 to a 100. The actual range observed in the sample reaches from about 4% to about 95%.

Even though the level of union density has decreased in all the countries in the sample of this thesis, there are differences in high- and low-density countries to this day. Thus, it should be possible to explore the implications this might have for climate policymaking. On another note, while the focus on climate change has gone up, and the union density has gone down, this does not necessarily mean that the two have any causal connection. There might be other mechanisms that affect this relationship, and thus this trend could in large be a case of "correlation but not causation". This is further discussed in chapter 5, where I present some of the methodological "fixes" and control variables I have tested to account for this. Also worth noting is that I do not attempt to claim any causal relationship between the two, but rather seek to investigate whether there exists a correlation between them.

One other clarification to make is that I, of course, do not expect unions to be one uniform group. There exist many different unions, and even for those unions that belong to the same sectors, there might be differences in their preferences, goals and strategies. Other differences are related to sectors. For instance, it is reasonable to believe that a union for academic employees might have completely different needs and interests than unions for oil rig workers. It would be of interest to test the union density of different sectors to see whether the correlation with the amount of climate policies differs between them. Unfortunately, this data is not available to a very large degree. Visser (2019) does have some variables that include this information, but the number of observations are too low for it to be possible to determine any larger patterns for all OECD countries. Instead, I will provide the descriptive statistics of these variables, in order for the analysis to be more transparent. These descriptives are presented in the same manner as Pontusson (2013) presents the decline in membership both in total and for different sectors, and can be seen in appendix B.

4.2.3 Independent variable - corporatism

As discussed in Chapter 3, corporatism has been used as an analytical concept in different ways. Earlier operationalizations were often based on the scholar's own judgment of countries' systems, or they were dummy variables (Jahn, 2016, p. 48). None of these early studies have included variation over time[6]. Jahn (2016) has developed a time-varying corporatism index that contains information for all OECD countries and a few more, based on the data from the ICTWSS database. He includes three main factors that he deems central for the conceptual and analytical meaning of corporatism: structure, function and scope. I discussed these different dimensions in chapter 3 in a more conceptual way. What follows here is exactly how they are measured. A schematic overview of the operationalization of the concept can be found in table 4.2. The table is inspired from Jahn's (2016, p. 54) presentation of the contents of the indicies. My version contains updated information from the OECD/AIAS ICTWSS Database glossary (2021) and Visser (2019), so that it reflects the data used in the updated version of the corporatism index.

As such, I have chosen to treat the corporatism concept as a continuous one, as I base my definition on the one that lies behind Jahn's (2016) corporatism index. Gronow et al. (2019) have criticized earlier research of oversimplifying the concept, and highlight the need to look at different factors that are often associated with corporatism instead. They look at factors such as concertation and strong tripartite organization. Because the conceptual understanding of corporatism is similar to that of Jahn (2016), I believe it is correct to go forth with the usage of this index, but I acknowledge that certain aspects might be of more importance in terms of environmental or climate politics than others. Additionally, different aspects might have different implications. For instance does Gronow et al. (2019) argue that strong tripartite cooperation is

[6]Neumayer's (2003) study contains some time periods, but only for 1980 and 1990-1999

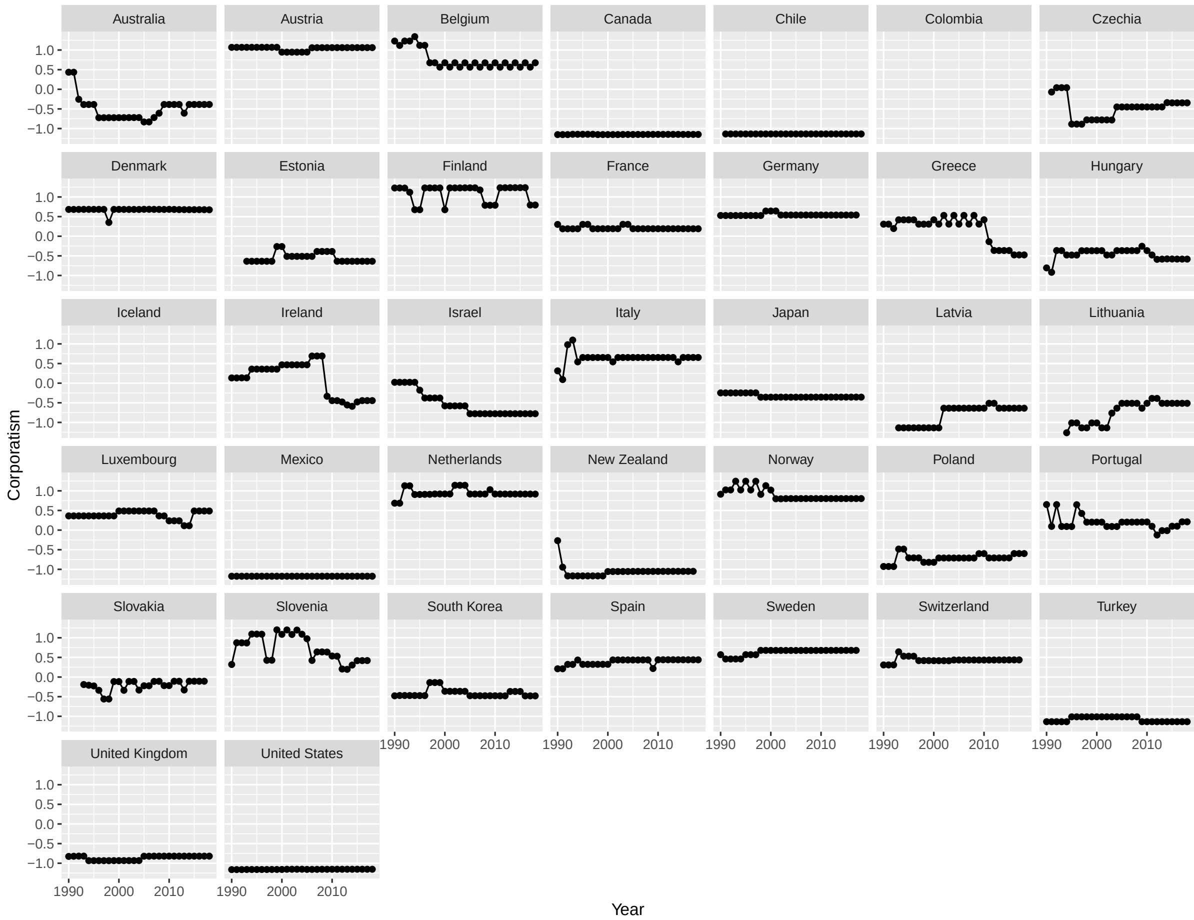


Figure 4.3: Degree of corporatism per country, 1990-2018

associated with higher emissions and lower environmental ambitions. Moreover, an index has the potential of masking certain connections that, in reality, are crucial. Thus, I will present how the different components used in the index correlate with the amount of adopted climate policies in appendix C.

New for the updated version of the index[7], is the inclusion of the *SECTOR* variable from the ICTWSS database (2019). This means that the index now also includes whether there are strong, medium or weak sectoral organization of employment relations. Jahn (2016), in the documentation for this new update, argues that more corporatist systems are also characterized as having strong employers' and employees' organizations, and that this is a crucial aspect of the concept that was not present in the earlier version. Both the original and the newly updated index are constructed through factor analysis. According to Jahn (2016), this factor analysis yields a clear one-dimensional result, meaning that the included variables all measure the same concept, or at least do not differ greatly from each other. Jahn (2016) provides multiple indices, with different coverage[8]. I utilize the index that contains 45 OECD and non-OECD countries, although I have filtered out only the OECD countries for my sample. In order to maintain flex-

[7]retrieved from `www.ipk.uni-greifswald.de/politikwissenschaft/data-download/#c1448541`

[8]The reason for this is that Jahn (2016) have imputed some missing values on certain items in order to include more countries. For the index that includes the 29 "core" countries, there was less imputations performed, and thus this is considered a more precise measure. However, the different indices correlate strongly

ibility, the index is made out of the sum of the z-scores of each category of corporatism (Jahn, 2016, p. 58). Figure 4.4 contains information about the levels of the corporatism index over time for each country in the sample. Levels have stayed more stable across the time period in the sample compared to the union density variable. However, just like for the union density variable, there are differences between countries in terms of having more or less corporatist systems. All new indices include data up to 2018, as this was the newest data from ICTWSS when the analysis of this thesis was conducted.

Table 4.2: Operationalization of corporatism

Category of corporatism	**Issue**	**Operationalization**	**Measurement**
Structure	I	Organizational structure of collective actors	Index with range from 0-1. Combines data on concentration and fragmentation of trade unions with information on the division of authority in the trade union movement.
	II	Structure of work council representation	4 = single-channel work councils established by unions or union representatives, based on laws or agreements 3 = dual-channel work councils where unions and work councils co-exist but unions dominate 2 = split-channel work councils where work councils are supplementary to unions and alternative representation is mandatory if there is no sufficient union representation 1 = single-channel work councils established by local agreements without legal provisions in the case of absent or non-sufficient unions 0 = no work councils or similar representation at the firm-level
	III	Right of work councils	3 = economic and social rights, including co-determination 2 = economic and social rights, consultation 1 = information and consultation rights 0 = no work councils or similar representation at the firm-level
Function	IV	Government intervention in wage bargaining	5 = the government imposed private sector wage settlements, places a ceiling on bargaining outcomes or suspends bargaining 4 = the government participates directly in wage bargaining 3 = the government influences wage bargaining outcomes indirectly through price ceilings, indexation, tax measures, minimum wages, and/or pattern setting through public sector wages 2 = the government influences wage bargaining by providing an institutional framework of consultation and information exchange, by conditional agreement to extend private sector agreements, and/or by providing a conflict resolution mechanism which links the settlement of disputes across the economy and/or allows the intervention of state arbitrators of Parliament 1 = none of the above
	V	Dominant level of wage bargaining	5 = nation or central level

			4 = nation or central level, with additional sectoral/local or company bargaining 3 = sectoral or industry level 2 = sectoral or industry level, with additional local or company bargaining 1 = local or company bargaining
	VI	Involvement of unions and employers in government decisions	2 = full concertation, regular and frequent involvement 1 = partial concertation, irregular and infrequent involvement 0 = non-concertation, involvement is rare or absent
Scope	VII	Coordination of wage bargaining	5 = economy-wide bargaining, based on (a) enforceable agreements between the central organizations of unions and employers affecting the entire economy or entire private sector, or on (b) government imposition of a wage schedule, freeze, or ceilin 4 = mixed industry and economy-wide bargaining: (a) central organizations negotiate non-enforceable central agreements (guidelines) and/or (b) key unions and employers associations set patterns for the entire economy 3 = industry bargaining with no or irregular pattern setting, limited involvement of central organizations and limited freedoms for company bargaining 2 = mixed or alternating industry- and firm-level bargaining with weak enforceability of industry agreement 1 = none of the above, fragmented bargaining, mostly at company level
	VIII	Mandatory extension of collective agreements	2 = legal provision for mandatory extension available, regularly applied and affecting significant share of the workforce (10%) 1 = legal provision for mandatory extension available, but not regularly or widely used (10%) 0 = legal provision for mandatory extension not available
Sector	IX	The sectoral organization of employment relations	2 = strong institutions (both employers and unions, some joint institutions 1 = medium (only one side, no joint institutions 0 = weak, or none

4.2.4 Control variables

When dealing with observational data, it makes little sense to only look at the specific variables of interest. By adding more control variables, one increases the ability of the statistical model to explain the relationship between all variables more correctly. However, even though it can be tempting to add many control variables, this can weaken the controlled effect of other variables of interest. Thus, control variables should be included based on theory and conceptual relevance (Christophersen, 2018, p. 59-61). Otherwise, it can potentially lead to post-treatment bias where the effect of the variable of interest is "controlled away" due to another variable (King, 1995). This issue makes it more difficult to understand the relationships between the variables that are theorized to have a connection. In the following section I describe the control variables included in the main analysis of this thesis. First, I present other variables related to interest groups and institutions. Then follows economically related ones, before I present the variables meant to account for connection to the international realm. A schematic overview of all control variables and belonging sources, has been included in appendix A. Models where I test control variables other than those presented here can be found in appendix C.

In chapter 3, I described the potential importance of environmental NGOs. However, I determined that they would only be of interest for this thesis if they have special access to policymaking. This is not likely, and is highly unusual in OECD countries. Thus, the explanatory potential of environmental NGOs lies with their representation of the level of environmentalism in society. This can, in part, be controlled for by the addition of the presence of green parties in government. Simultaneously, the addition of this variable is meant to serve as a control for green parties' access to policymaking. If a country has green parties in their parliament, then it most often increases the likelihood of adopting more climate policies. Simultaneously, these parties are, in many ways, an example of how environmental movements and broader (or more specific) environmental goals are formally brought into the political agenda (McBeath & Rosenberg, 2006, p. 73). Hence, they are perhaps more interesting than environmental NGOs in terms of policymaking because they reflect the public's feelings towards climate change more directly, as well as the government's willingness to adopt climate policies. Furthermore, environmental NGOs and similar interest groups, "only" attempt to *influence* policymaking. Green parties' goals, on the other hand, is to be elected and thus gain direct access in a different way than interest groups (McBeath & Rosenberg, 2006, p. 74). Although the green parties in OECD countries are often small compared to the more established parties, many OECD countries have elected green parties into their decision-making institutions. This could have an effect on the adoption of climate policies directly, but it could also be that the green parties affect other parties' attitudes and thus have an indirect effect on climate policymaking. Anyways, this is an important factor to control for.

The data for this control variable has been adapted from the V-party dataset (2020). This dataset contains information about political parties from 169 countries across 1560 elections (Lührmann et al., n.d., p. 4). To construct the variable used in my analysis, the most relevant variable was the "v2pasalie" variable. This measures which subjects are the most relevant for the party in obtaining votes. "v2pasalie_12" indicates if at least one out of a maximum of three key subjects for a party is connected to environmental protection. I have filtered out the parties that have more than 50% on this variable, which means that there is a general agreement amongst 50% of the expert coders that a party has protection of the environment as a primary concern. The control variable that I construct ends up measuring the number of environmental parties that have a place in parliament or similar institutions for a country-year.

Values for the periods between the elections have been filled in with the assumption that the political parties' seats have not changed before the next election. Because environmental parties are usually small in the OECD countries, the maximum number of environmental parties that have seats only reaches 2. One other measure that I considered was whether these environmentally concerned parties received any votes. The two measures correlate strongly, and I have thus tested them separately. In a way, the variable that measures environmental parties that has received votes, can be said to measure the level of environmentalism in society to a greater extent. Results that instead use the second measure can be found in appendix C.

There exists another institutional factor which remains of interest, namely the degree of democracy for the sampled countries. An emerging body of literature studies the link between democracies and environmental politics. It has been argued that more democratic institutions are slow, and thus not favorable for climate policymaking. Moreover, the climate change mitigation of these countries is lacking (Bättig & Bernauer, 2009). However, others argue that countries with a higher degree of democracy have preferable characteristics for climate change policymaking. For instance, countries with a higher degree of democracy have often been associated with lower emissions levels as well as being found to implement more climate policies than countries with lower degrees of democracy (Lachapelle & Paterson, 2013). Conversely, other scholars find that countries with higher degrees of democracy commit to many climate change mitigation promises, but fail to act on them sufficiently (Bättig & Bernauer, 2009). Based on these observations, the degree of democracy for a country is important to control for, regardless of either a positive or negative effect on climate policymaking. In order to account for differences between countries based on their degree of democratic institutions, I have chosen to include the V-dem (2021) democracy index. This index that measures the degree of democracy is preferable when the sample is OECD countries since all the countries are democracies.

The inclusion of a few economically related control variables is also necessary. The widespread usage of GDP per capita also applies to this thesis. GDP per capita indicates economic growth which affects the number of climate policies that a country adopts. For instance, higher levels of GDP per capita is often associated with more emissions due to transportation, energy usage and other factors that contribute to carbon usage (Neumayer, 2003). However, literature related to the Environmental Kuznet Curve argues that the population of high-income countries starts to become more environmentally concerned, and thus often demand more climate change action from their governments (Alstine & Neumayer, 2010). This could influence the amount of climate policies that are adopted, and thus it is necessary to control for this factor. The GDP per capita data is retrieved from the OECD (n.d.). Additionally, I have included a measure of emissions per capita. There is a possibility that emissions levels and climate policies correlate, something that has been found by scholars such as Eskander and Fankhauser (2020). They argue that the causal direction is that climate policies lead to lower emissions, but the opposite may also be the case. No matter the causality, the previously proved correlation calls for the inclusion of this as a control variable in this thesis. Emissions data is sourced from Our World in Data (2021), and population data was sourced from the World Bank (2021). To create the variable, I divided the total emissions on the total population for each country-year. Both the GDP per capita and the emissions per capita variables are logged.

I have also theorized the importance of industry for environmental and climate related attitudes of relevant actors. If a country's economy relies on industrial production to a large degree, it is plausible that adopting climate policies is less likely. This is related to economic growth, which for many countries continues to be an important concern even if they are environmentally concerned, but might also have important implications for the direction of the possible relationship with interest groups and institutions. Thus, a measure of industry as a share of GDP is included. The data is downloaded from the World Bank database (2021). Alternative measures, based on Ross and Mahdavi (2015), are also tested. These are dichotomous variables that measure whether a country is a fossil fuel producer or not, and whether a country is a fossil fuel exporter or not. The variables contains less missing than the first mentioned alternative, but other issues arises. First of all, nearly all OECD countries produce fossil fuels, and the data does not determine whether the production happens within or outside of the country. Second, measuring the export of fossil fuel could in reality be a measure of general trade, which is included as another control variable. Nevertheless, the results from regression models that include the fossil fuel related variables are reported in appendix C.

Additionally, I have included certain variables which measure different aspects of the relation between countries and the international environment. Trade openness is included as a measure of how economically reliant a country is on other countries. This is a quite stable measure for OECD countries, obviously, but there exists some variation. It is measured as the share of trade in GDP, and is retrieved from the World Bank (2021). Moreover, it is possible that membership in international environmental agreements affects the number of adopted climate policies within a country. However, this may also correlate with the dependent variable, and thus I could be dealing with endogeneity. Instead, I have tested the signature and ratification of the Kyoto Protocol as an additional dependent variable. This can be found in appendix C. As a proxy, I measure whether a country is an EU member or not. The EU is known to be climate leaders in today's international environment, and thus it also controls for the effect that membership in this union might have on the amount of adopted climate policies. This is a dichotomous measure that I have coded myself, based on information from the official web page of the European Union (the European Union, 2021). All observations should reflect the membership status of the given year for a given country.

Chapter 5

Methodology

In this chapter, I present the methodology utilized to test the hypotheses from chapter 3. The research design of the thesis is quantitative, justified by the aim to encounter broader trends in union density and climate policy data for OECD countries. Because the dependent variable that I end up with is structured as a count of adopted climate policies, I have chosen to utilize count regression models. Hence, I begin with presenting the negative binomial count model, which is what the main models in chapter 6 are. After presenting the implications of the chosen regression models, I discuss some possible methodological challenges.

5.1 Choice of statistical model

As mentioned, I have chosen the operationalization of the dependent variable that divides the original event data into count data. I found this option better than the option of a dichotomous dependent variable. The latter would lead to a logistic regression model, and would predict the likelihood of experiencing one or more climate policies in a country-year. By going with the count version, the model will predict the probability of adopting a specific number of climate policies in a country-year. Although there is quite a bit of stability in the amount of climate policies that countries adopt, there is also some interesting variation. This is an important reason for choosing the count operationalization of the dependent variable, as it drops less information from the original data. For instance, while Denmark adopted six climate policies in 2009, Norway adopted only one the same year. To go with the dichotomous operationalization of climate policies would be to treat these two observations as the same, therefore I would not be able to explore the outcome of mechanisms found behind the adoption of different amounts of climate policies. According to the theoretical assumptions, it is likely that organized labor will affect not only the adoption of policies, but also the amount of climate policies. Nevertheless, I present the results from a logistic regression model in appendix D. The results are not significant, which indicates that labor unions and corporatism might be more important for the prediction of the amount of climate policies rather than for the adoption of them alone.

This choice of operationalization means that I am dealing with integers bound at zero. Thus, there are a few issues that would arise with the usage of regular ordinary least squares (OLS) regression. Firstly, the residuals are not normally distributed, which is a prerequisite for the usage of OLS regression. This is because the error term is larger around the bigger values. Additionally, OLS will produce predictions that are "impossible", or not observable in real life (Ward & Ahlquist, 2018, p. 190). For instance, the model could predict that a state would adopt less than zero climate policies in a country year. This, of course, does not make sense. Adopting -5 policies is not possible, and such values do not exist in the raw data either. Additionally, the outcome variable is highly skewed to the right. This is because we see non-occurrences, or 0, for most of the observations. Thus, instead of using OLS regression, one should use statistical models that are specifically made to deal with integer values, or count data, such as Poisson models or negative binomial models (Ward & Ahlquist, 2018, p. 191).

5.1.1 The Negative Binomial model

In this case, count models calculate the probability of adopting a specific number of climate policies in a country-year. A logical first step when exploring which count model to choose, is to first test the Poisson regression model. First, I will briefly explain the logic behind a Poisson model, before I explain why the negative binomial model sometimes is a better fit.

In the case of the Poisson model, the dependent variable Y_i, which contains counts of an event occurring, follows the Poisson distribution with parameter vector $\theta = (\lambda, h)$. We assume that the dependent variable follows the *Poisson process*, meaning that events are independent, the probability of an event occurring is not influenced by the occurrence of other events, and the rate of events' arrival for is persistent (Ward & Ahlquist, 2018, p. 191). Hence, the Poisson equation is:

$$E[Y_i] \equiv h\lambda_i = he^{x_i^T}\beta \tag{5.1}$$

Count data is expected to be intrinsically heteroskedastic, and the Poisson model captures this by increasing the variance with the mean, one by one. If I had run an OLS model, the variance would increase with the Y, and the error calculations would be wrong. Thus, the Poisson model assumes equidispersion, which means that the variance should equal the mean, μ (Ward & Ahlquist, 2018, p. 197). The mean can also be thought of as the expected count (Long, 1997, p. 218). This expectation of equidispersion is then denoted:

$$Var(y) = E(y) = \mu \tag{5.2}$$

The assumption of equidispersion is constraining, and is often violated in observational data. Very often, the variance is either larger or smaller than the mean. This is called over- and underdispersion, where the first is the most common in social science (Ward & Ahlquist, 2018, p. 199). The negative binomial model does not have this strict assumption of equidispersion, and can handle overdispersion. Often, the negative binomial model is used even when there is no observable overdispersion, as a "just in case" measure. Thus, it is a more common strategy to pursue, especially within political science. For the usage of this model, a more flexible distribution than the Poisson distribution is specified to derive the log-likelihood. The distribution that is chosen for λ_i in this case is the gamma distribution (Ward & Ahlquist, 2018, p. 202)[1]. The model assumes that the events are generated by two processes (Ward & Ahlquist, 2018, p. 203). The first process is denoted:

$$\lambda_i = exp(x_i^T\beta)exp(\mu_i) \tag{5.3}$$

μ_i is an error term in the expression for the Poisson mean, λ_i. If we let $\mu_i = expx_i^T\beta$ and $v_i = exp\mu_i$, we can complete the model:

$$\lambda_i = \mu_i v_i \tag{5.4}$$

[1]Which is convenient because it begins at 0 and has a long upwards tail, just as the marginal distribution of Y_i (Ward & Ahlquist, 2018, p. 202)

$$v_i \sim f\Gamma(\alpha) \tag{5.5}$$

The v_i is a parameter that is drawn from the gamma distribution. The α parameter informs the gamma distribution, and allows the variance to be greater than the mean. Y thus follows the negative binomial distribution[2], where parameter vector $\theta = (\mu, \alpha)$. The negative binomial model retains the $\phi = 1$ assumption of the Poisson and instead uses the α to account for over-dispersion (Ward & Ahlquist, 2018, p. 204). Both the coefficients and the standard errors in a negative binomial model will differ from the Poisson model (Ward & Ahlquist, 2018, p. 205). In the negative binomial regression model, variation in $\tilde{\mu}$ is due both to variation in the independent variables among individuals and to unobserved heterogeneity introduced by ϵ. The most convenient assumption of the negative binomial model is that $E[\delta = 1]$. This assumption implies that the expected count after adding the new source of variation is the same as it was for the Poisson model (Long, 1997, p. 232). The negative binomial distribution is denoted as such:

$$Pr(y_i|x_i, \delta_i) = \frac{e^{\tilde{\mu}_i} \tilde{\mu}_i^{y_i}}{y_i!} = \frac{e^{(-\mu_i \delta_i)(\mu_i \delta_i) y_i}}{y_i!} \tag{5.6}$$

In my case the occurrence of one or more newly adopted climate policies in a country-year, or counts above 0, will be treated as successes, and the country years without any newly adopted climate policies, 0's, will be treated as failures. The negative binomial model then fixes the failures and lets the successes be random. In the end the model estimates how many years without any newly adopted climate policies are needed before different counts of policies are adopted. Or, in other words, based on the data the model calculates on, it predicts the probability of the adoption of a specific number of climate policies in a country-year.

Exposure window

With the Poisson and the negative binomial models, we are dealing with a "window", or an exposure interval, in which one can see the number of an event occurring. In the case of this thesis the exposure interval is one year, and the occurrences that we count are newly adopted climate policies. The exposure interval is denoted h, while the (logtransformed) average number of events within this window, $(t, t+h)$, is called the arrival rate and is denoted λ. The likelihood of an event occurring within the interval is λh, and the likelihood of no event is $1 - \lambda h$. Different values for λ lead to differences in the probability predicted (Ward & Ahlquist, 2018, p. 191). If all intervals, or windows, are the same length, it means that we can set the exposure parameter to 1 and ignore it. This is what R does by default unless anything else is specified.

As mentioned, the exposure window for this analysis is one year, which we can assume is equal for all countries in the sample. However, if the case is that the units have different exposures, one can go with two main strategies to control for this. The first, the offset strategy, implies the inclusion of the size of the window into the equation and restrain the coefficient as one. The latter implies including the logged exposure variable as a parameter so that the coefficient can be interpreted from the regression table (Ward & Ahlquist, 2018, p. 195). To account for different exposures would be needed if, for instance, some of the countries in the sample had been countries for less amount of years than the others, and thus have had fewer chances to adopt new policies. As seen in appendix C, I have included these different exposures into the model by following the two outlined approaches, so that the predicted counts vary with the different

[2] $E[Y_i]$ still equals λ_i, but the expected value of λ_i now equals μ_i. Thus, the expected value of Y_i equals μ_i, which is modelled log-linearly as $exp(x_i^T \beta)$.

exposure times. To do this I have first made a variable indicating how long a country has been independent per year, and logged it. Then, the logged exposure variable has been included as the offset, or estimated as a parameter. The models with these two strategies are presented next to each other in C.1. There does not seem to be any reason to estimate a parameter in this case, as the two offset specifications have similar outcomes. However, to include the exposure within the equation seems to make the model better. This is based on the comparison of the AIC values. Thus, the main model will have the logged independent years of a country as the offset specification.

Diagnosing and controlling overdispersion

Making a rootogram is an intuitive way to identify whether there is equidispersion or not within a model. Rootograms of all Poisson and negative binomial models can be found in appendix E, alongside an explanation of how to interpret the plots. The choice of the negative binomial model is, in this case, based on the discovery of overdispersion in my data. Overdispersion can be caused by multiple factors, and these might not be solved solely by going with a negative binomial model because the reason for the over- or underdispersion might be due to other specific issues. The most obvious reason for overdispersion is perhaps that one has wrongly assumed that the exposure is the same for all entities. The choice of changing this specification has improved the model, but there are also other possible reasons for overdispersion that might be present simultaneously. These other reasons might be surplus zeros, positively correlated events, or including the "wrong" control variables in the model (Ward & Ahlquist, 2018, p. 199). Inconsistency and inaccurate results can occur, which would lead to the wrong inferences, and overdispersion is therefore a phenomenon that should be scrutinized (Ward & Ahlquist, 2018, p. 198) and (Long, 1997, p. 230).

Sometimes, it can help to include random intercepts or fixed effects to account for poor variable choice. Then the negative binomial model could still be the best choice. However, if overdispersion is caused by data that contains many 0's, then a different count model might be more appropriate. As evident from figure 5.1, there are many zeros in the count variable. In fact, they account for about 70% of the observations. Excess zeros can lead to overdispersion, and thus affect the calculations of the model's standard errors. While the negative binomial is a preventive measure to take for this issue, there exists more specific solutions for data where overdispersion is caused by many zeros. This would be the zero inflated model or the hurdle model. Unfortunately, the zero inflated negative binomial model usually demands a lot from data, and as such did not work well with this data. Instead, I present the results from a hurdle model in appendix D.

Allison (2012) suggests that although a Poisson model often is unfit for social science data because of overdispersion, it is usually enough to instead utilize a regular negative binomial model to account for this[3]. Compared to the negative binomial models, model 3 in table D.6 gets a lower AIC when tested as a hurdle model. This indicates that the hurdle model is a better fit. The results from this model indicate that there might not be much of a relationship between union density, corporatism and adopted climate policies, as the coefficients are close to zero and non-significant. This indicates lower robustness of the results from the main models. However, model 1 and model 2 in table D.2 have a higher AIC compared to their negative binomial "twins". This suggests that the negative binomial is a better fit. Thus, I choose to opt

[3]Unless other specific solutions help, such as fixed or random effects, or if a model that accounts for surplus zeros are, in fact, more fit

for the negative binomial models as the main models.

It is possible to ignore overdispersion if there is reason to believe that it is not an issue. Overdispersion does not affect the coefficients, but leads to inconsistency and bias in the standard errors. Thus, the uncertainty of the model will not be correctly estimated. The negative binomial model has been chosen as the best control in this thesis, but one can also try the quasi-Poisson model. The quasi-Poisson differs from the Poisson model in the standard errors, and is a similar process as adding robust standard errors to a model. The quasi-Poisson model can be seen in appendix D.

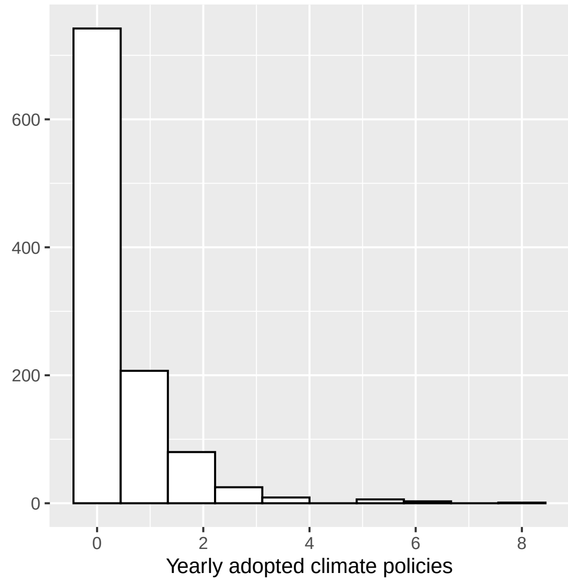


Figure 5.1: Distribution of dependent variable

5.1.2 Panel data characteristics and fixes

As stated in section 4.1, the data used in the analysis is structured as an unbalanced panel data set. This entails that observations are sorted as country-years, and that there are missing observations for at least one entity's time period. Panel data exhibits a certain set of characteristics that might be problematic when estimating regression models. The error term in panel data, for instance, is often correlated over time within an entity. This affects the calculation of the standard errors, making the uncertainty measurements imprecise (Stock & Watson, 2012, p. 404). To account for this, and for heteroskedasticity, I have included standard errors clustered on country. This also controls for autocorrelation, which is a prevalent problem with data over multiple time periods, due to the simple fact that events are usually correlated over years (Stock & Watson, 2012, p. 405). Regular robust standard errors that control for heteroskedasticity do not help in that case, which is why the clustered ones are utilized. They allow the error term to to be serially correlated within countries or years, depending on what we cluster them to (Stock & Watson, 2012, p. 407). Different specifications of heteroskedasticity and autocorrelation-consistent (HAC) standard errors, and the effect this has on the results, can be seen in Appendix C.

I try different model specifications in order to account for autocorrelation in the data. One other fix is to specify an autoregressive model. In my case, I include the dependent variable lagged by one, which means that I utilize a first order autoregressive (AR(1)) model. In addition to controlling for autocorrelation, AR(1) models can also help with omitted variable bias (Christophersen, 2018, p. 169). AR(1) models can also reduce serial correlation, which is typical for time series and panel data. However, in order to test different fixes, I also specify a model that includes a time trend variable. This variable represents when the measurements are taken, which in my case is year, and seeks to reduce correlation that can be attributed to time itself instead of to the variables of interest (Christophersen, 2018, p. 170).

Fixed effects are, like AR(1) models, also argued to be a strategy that can alleviate concerns about omitted variable bias (Stock & Watson, 2012, p. 393). This is possible when there are omitted variables that are different for each country, but stay constant over time (Stock & Watson, 2012, p. 396). It is done by adding a dummy variable for each country (Stock & Watson, 2012, p. 397). In addition, one can do the same for year, by adding year fixed effects. This would be to control for variables that stay the same across countries, but change over time (Stock & Watson, 2012, p. 400). Then we add a dummy variable for $T - 1$ (Stock & Watson, 2012, p. 401). Often, as could be for my case, it might be appropriate to add both. In that case, the model limits omitted variable bias that arises from unobserved variables over time, and for unobserved variables across countries (Stock & Watson, 2012, p. 402). This is also the reason why fixed effects might help with overdispersion in count models.

However, it is important to note that fixed effects do not control for non-included variables that vary across entities and over time simultaneously (Stock & Watson, 2012, p. 411). This means that we can not draw causal inferences when fixed effects are used, although much is accounted for[4]. The issues with determining causality, as well as other methodological challenges are further discussed in section 5.2.

An alternative to fixed effects are random effects, which is a more flexible measure that controls for the same issues as when utilizing fixed effects. However, with random effects one has to assume that the unobserved effects for each country are uncorrelated with the independent variables. This is most likely not the case for my data, especially since many of the independent variables in my model seek to capture differences in institutions which is also something I to some extent cannot control for. In order to determine whether a random effects of fixed effects is the more appropriate, I performed a Hausman test (appendix E). The significant result indicates that the fixed effects specification is the better fit.

5.2 Methodological challenges

As with most methods, there are also challenges. In this section, I discuss some of the most present challenges with the chosen research design, as well as the implications of them and how I meet said challenges. The most present challenge that I discuss here is the case of causality[5], omitted variable and post-treatment bias, multicollinearity and missing values.

[4]Instrumental variables are often used to control for omitted variables that vary across time and entities, in order to uncover causal connections. Unfortunately, I was not able to find a strong enough instrument for the analysis in this thesis in time for the deadline.

[5]Although my goal is not strong causal inference, I can not claim that this is not usually the main goal of studies in general. I seek to understand the relationship between the main variables better, and this entails that the correlations should be at least theoretically plausible.

Causality

The goal for all scientific studies is to determine some kind of causal relation between the dependent and independent variable(s). But strict causal inferences are tricky to arrive at. First of all, one does not necessarily find the causal effect of the independent variable on the dependent variable just by comparing observations that have been assigned the treatment, i.e. are affected by the independent variable of interest, or not (Angrist & Pischke, 2015, p. 4). In social sciences, we are dealing with observational data and are thus rarely able to conduct randomized studies. For instance, dividing OECD countries and assigning them a higher level of union density at random is impossible. The data I have at hand is a description of already passed events. Thus, other strategies towards causal inferences for observational data are needed. Regression, with different specifications depending on whether a set of assumptions are met, is the most common way to go. When conducting regression, we assume that selection bias is (almost) not present when holding all relevant observed variables constant (Angrist & Pischke, 2015, p. 47).

However, we cannot determine causality by looking at the correlation between a count of adopted climate policies and whether there exists a high or low union density. This is because there might be other factors that affect the adoption of climate policies, besides union density. As I already touched upon, omitted variables are a threat to causal inference in regression specifically. It is very difficult to make a full list of possible factors, and no way of testing all of these simultaneously (Gerring, 2010, p. 1510). Even if the correlations between key variables are assumed to not be caused by selection bias, it might be difficult to determine exactly what it is that causes the relationship. Therefore, covariation is often treated as causality even if the causal *mechanisms*, or reasons for the correlation, are unidentified (Gerring, 2010, p. 1506). Moreover, there might be numerous theoretically possible causal mechanisms behind a covariational relationship and it can be difficult to determine the relevance of all of these (Gerring, 2010, p. 1509).

Furthermore, operationalization of vague theoretical concepts that are often found in social sciences makes it difficult to arrive at causal inferences because they are difficult to measure properly. There could be many sources of causality within one concept (Gerring, 2010, p. 1511). For instance, the concept of corporatism is made up of many different factors in most studies. It could be that there are many different ways that this concept affects the outcome causally, but because of how it is operationalized it could be difficult to find each of them. Moreover, there might be many different mechanisms present simultaneously. Different variables can all explain some of the outcome, and they might even be conditional upon each other. This lends much power to the way research is conducted, and also calls for more than one study on a relationship to uncover all these possible causal pathways (Gerring, 2010, p. 1511).

Much can be argued based on theory. Nevertheless, it must be acknowledged that theories in social sciences are rarely deterministic. This means that one study is rarely enough to detangle complex puzzles (Gerring, 2010, p. 1514). In order to arrive at causal inference, the study relies more on research design and sample than the specific regression techniques utilized. Because even with advanced techniques, there might be confounders, or unidentified key variables that are not controlled for, and the sample might be unfit for generalization. However, descriptive studies such as the one of this thesis are not useless. When building theory or when first beginning to explore a problem, they can contribute with important insights (Samii, 2016, p. 952) and (Gerring, 2005, p. 165). Previous research has not determined whether there is correlation between union density, corporatism and the amount of yearly adopted climate policies. My goal is not to arrive at a strict causal inference, but to investigate a potential relationship between key variables as well as illuminate possible explanations for these based on theory. My study is step one, but further research is needed in order to arrive at a more conclusive answer, and in order to test different implications.

Omitted variable and post-treatment bias

As mentioned previously, a threat to causality, or finding real correlations between variables of interest, is difficult because it is very difficult to include all possible confounders into the model. First of all, it is difficult to think of all of them in the first place. Second, it is a difficult task because including too many covariates would lead to post-treatment bias. What this means is that important variation is "controlled away", and thus correlation might be covered up. This happens due to choosing the wrong controls, for instance, by controlling for something that is caused by the treatment or by including irrelevant control variables. However, sometimes it is difficult or impossible to avoid post-treatment bias, especially when we are unable to perform experiments. Thus, we are often faced with the choice between omitted variables bias and post-treatment bias (King, 2010). To avoid the unavoidable biases, I leaned on theory to choose the relevant control variables. Additionally, I tried both different controls and different operationalizations of the controls in order to assess the robustness of my results.

Multicollinearity

A common problem for regression is multicollinearity. Multicollinearity implies that an independent variable correlates with one or more of the other independent variables in the model. If there is a strong trend of multicollinearity in a model, it can lead to inaccurate results and estimating significant results might become difficult. Often, one should consider correlations of more than 0.8 between the variables as problematic. A variance inflation factor (VIF) test can also help determine whether multicollinearity is an issue in the model. For the latter, values above 5 might indicate problematic multicollinearity (Christophersen, 2018, p. 76). A less conservative threshold of 10 is also broadly used in social sciences. In table B.2, the correlation matrix of the variables from my dataset can be seen. None of the correlations are higher than this threshold. The results from the VIF tests for my main models can be seen in appendix E.

Missing values

When basing the analysis on observational data, missing values are a common threat. How and which data is missing, can effectively skew the sample that is used in the regression models due to listwise deletion. In that case, the sample that one claims to have might not equal the sample that one can actually base inferences on. Moreover, there exists a lot of information that is dropped in these deleted cases. So what to do with missing values? One solution is to impute missing values. This is often done by performing multiple imputation, by predicting the values that are missing and filling in the missing values with the predicted ones (Honaker et al., 2010, p. 563). However, most often, scientists leave the missing values as they are and run the analysis on the actual data at hand. It does raise the need to be transparent about what the missing data is, but is in the end the most clean approach. In appendix B, I present the descriptive statistics of this analysis. Here, both missing values per variable, and also a list of the countries that are included in the models are presented.

Chapter 6

Results and discussion

According to the hypotheses derived from the theoretical framework, I expect that there is a correlation between the density of organized labor and the number of climate policies that are adopted in a country-year. I also expect there to be an interaction effect between union density and corporatism, as both the size of unions and their access to institutions should be of importance for the adoption of climate policies according to theory. The aim of this chapter is to test the hypotheses that were presented in chapter 3. This will be done by looking at the statistical evidence at hand. First, I will inspect the descriptive evidence of key variables. These are interpreted with care, since they can only highlight some trends from the raw data and should not be the basis of any causal inference[1]. Second, the results from the regression models follow. Third, I discuss the patterns in a more substantial way by constructing scenarios based on the regression models, before turning to the interpretation of the conditional models.

A look at the descriptives

Before the presentation and discussion of the regression models begins, I will present a few descriptive figures. This is done in order to highlight some of the main trends in the data, but can also be helpful when identifying potential problems for inference. Looking at the descriptions of the raw data should be done with great care, as they do not necessarily show a complete picture. Any perceived correlations might in fact be caused by other factors. Simultaneously, descriptive statistics can highlight some interesting connections in the data, including potential pitfalls.

Figure 6.1 shows the trends of newly adopted climate policies for the full sample, i.e. all of today's OECD countries from 1990 to 2018. The solid black line presents the yearly sum of newly adopted climate policies in the sample, while the grey line presents the number of countries with one or more adopted climate policies per year. The general trend is that the amount of adopted climate policies per year has increased. From 2000 to 2010, the amount of yearly adopted climate policies has more than quadrupled, or increased from just below 10 policies to about 45 policies. In the early 2000's, there exists a bigger dip in the amount of newly adopted climate policies. This may be the result of a common "shock" that the countries within the OECD have experienced. It is difficult to pinpoint exactly what the reason behind this decline is, but one plausible reason could be economic recession that has affected mostly economically developed countries at the time. When countries experience issues that are not directly related to climate change, like financial crises or pandemics, their attention is often directed towards

[1] Regression models do not necessarily alleviate concerns about causal inference either, but at least presents a more complex picture than pure descriptive statistics. Moreover, I do not seek to make causal inferences.

these other issues instead of towards formulating more climate policies. Because of this, it may be difficult for countries to keep their attention span focused on climate related issues, as other crises may seem more important in the short run, or more pressing to deal with. As such, climate change, although it is perhaps a greater issue in the long run, might be seen as a less pressing issue in situations with other urgent challenges (Hovi et al., 2009). Nevertheless, the line that represents the count of newly adopted climate policies has gone up in total. The mid-10 years represent the most steep increase compared to the first and last 10. Also, the number of countries with newly adopted climate policies has gone up since 1990, but has increased a bit slower than the number of policies themselves. This points to the fact that some countries adopt more policies than others, further supported by the fact that the grey line never reaches the full number of countries in the sample, which is 37. Instead, it ends up hovering around 15-25 countries at the highest, which is not even the full number of countries that are effectively included in the regressions: 30. How the countries differ from each other in terms of characteristics other than the number of climate policies they have adopted will be further explored below, and in section 6.1.

The chosen time period of the sample is relatively short. Thus, the trend of newly adopted climate policies seen in this sample might be affected by specific events to a greater degree than if the sample had a longer time period. If the latter was the case, it could be easier to speak of a stable trend. For instance, countries that are members of the OECD today and are thus included in the sample, were not all independent countries in the beginning of the time period of the sample. With the collapse of the Soviet Union, many of the Eastern European countries gained independence around 1991, 1992 and 1993. For newly established countries, with newly established institutions, there will obviously be many new policies adopted in a short amount of time, including climate change related policies. This is something to keep in mind when looking at the yearly trend of newly adopted climate policies, because an increase in the years directly after independence would likely be affected by such events. From figure 6.1 there does not seem to be an alarming amount of newly adopted climate policies in the years shortly after 1993. In fact, there seems to be a small dip in both the amount of newly adopted climate policies and the amount of countries with one or more newly adopted climate policies around this time. Still, as evident from the other ups and downs of the trend lines in the figure, a shorter time period can give a more skewed image of reality. Simultaneously, in the case of climate change, it makes sense with a shorter time period since it is a more contemporary issue that first began appearing around 1990. The period from 1990 to 2018 adds up to almost 30 years, which ends up being an acceptable time period after all.

Figure 6.2 shows the distribution of country-years along the different counts of newly adopted climate policies. The first figure presents the distribution of observations along different levels of union density, and the second figure focuses on corporatism. No matter the level of any of these independent variables, the vast majority of observations are bundled together at zero new climate policies per year. A few more observations with a lower level of union density are seen as the count goes up, but this does not necessarily mean that union density is a reason for why some countries have more climate policies than others. As previously discussed, the overall union density has decreased in the OECD countries, and the level for most observations are in the lower half of this variable. Thus, this pattern should be interpreted with care. The fact that more observations with lower union density are better represented in the higher counts might just be because of the higher number of observations in those levels alone. Further, there are some "outliers" in the higher counts. Very few observations have more than 3-4 newly adopted climate policies. In fact, only one observation has 8, and that is Spain in 2013. Spain had a

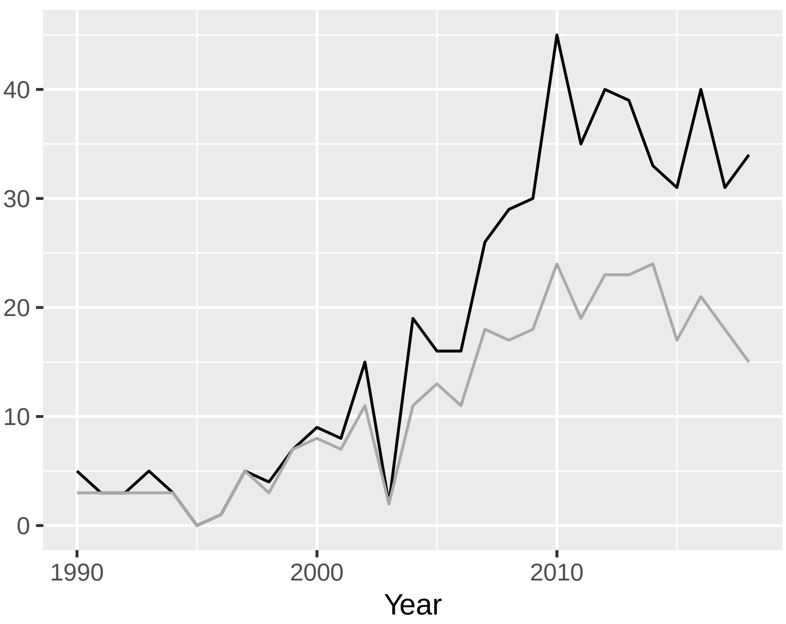


Figure 6.1: Climate policy trends, 1990-2018

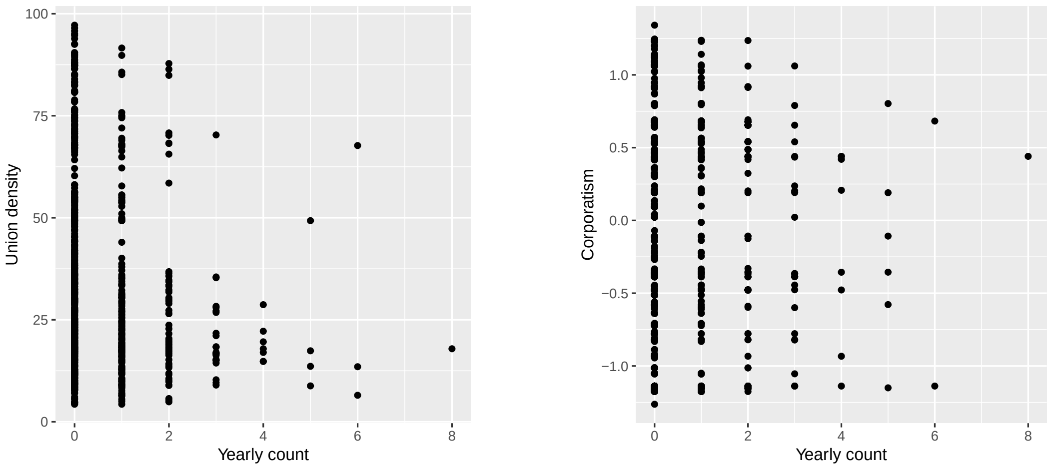
very low level of union density, and a medium level of corporatism around this time period. While it would be interesting to have a closer look at the specific case of Spain, this observation does not necessarily point in the direction of a causal relationship between union density and the number of adopted climate policies[2]. Figure 6.3 shows the same distribution of observations from three different years, in order to further highlight the strong time trend in the data. The number of yearly adopted climate policies has gone up, as evident by figure 4.1 and 6.1, while the level of union density has decreased, as evident from figures 4.2, 6.2 and 6.3. In order to understand more about this relationship, it is necessary to explore how other covariates might alter the correlations.

The observations' level of corporatism seems to be more stable across the counts of yearly adopted climate policies than the union density. All the counts have observations with both high, medium and low levels of corporatism, and do not point in any specific direction. It is not surprising that a variable meant to indicate institutions has little variation over the years. This is because change in institutions rarely happens very suddenly (Jahn, 2016). A look at the figures 4.3 and 6.2 show that the levels of corporatism are indeed stable over years included in my sample. From these figures, there does not seem to be a pattern of corporatism that distinguishes the countries with higher and lower counts from each other. This does not, of course, automatically mean that this specific variable is unimportant, but rather that the specific operationalization stays stable and contains little variation amongst the observations in the sample. Figure 6.4, to the right, presents the density of observations that are above and below the mean level of corporatism along the different counts. In this figure, the missing values are also presented. This figure underscores the stability of corporatism along the different count of newly adopted climate laws, although there is a slight overweight of observations with below mean levels of corporatism. Other ways of measuring corporatism could potentially create a dif-

[2] Because this is a more "extreme" observation, it might bias the results. Thus, the regression models are run with and without this observation, as well as without other outliers, to see if the results differ greatly. They do not, and results from the models without outliers can be found in appendix D

ferent picture, and will be further explored in section 6.1, along with a look at other explanatory factors.

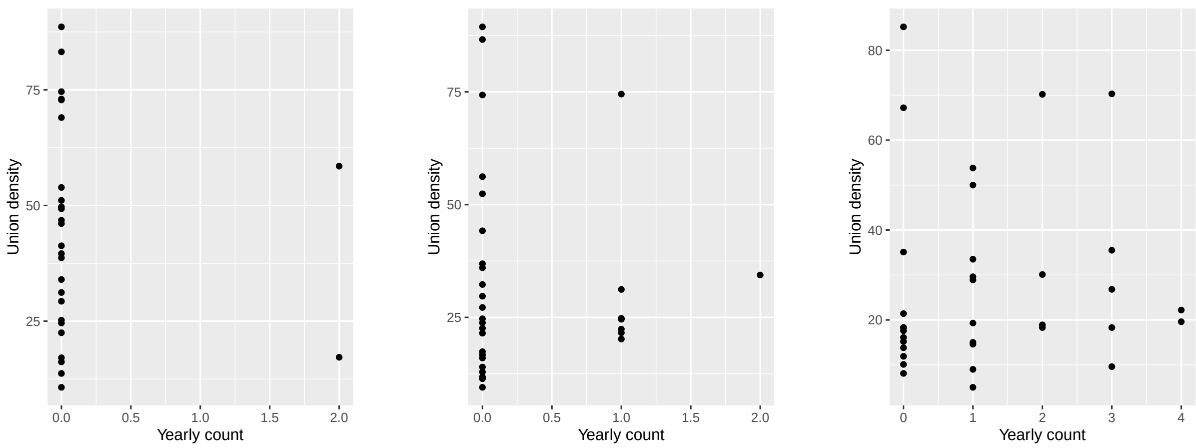
Figure 6.2: Distribution of observations along key variables



Observations by union density and count of adopted climate policies

Observations by corporatism and count of adopted climate policies

Figure 6.3: Observations by union density and count of adopted climate policies, different years

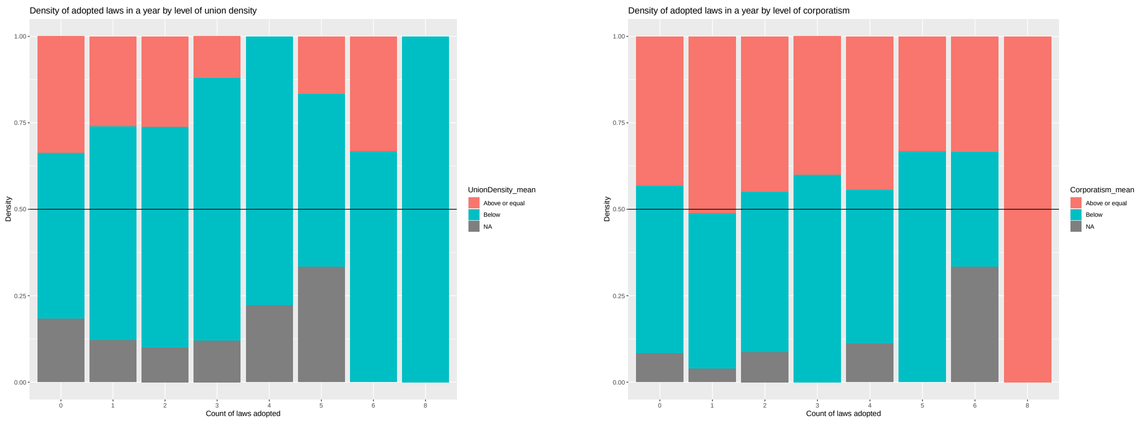


1990

2000

2010

Figure 6.4: Density of observations along key variables



Density of adopted climate policies by level of union density

Density of adopted climate policies by level of corporatism

6.1 Regression results

Based on the descriptive findings, some interesting patterns appear. However, it is impossible to say anything about how other variables come into play by only viewing these. In this section, I present the results from the statistical models that have been tested. The main models are negative binomial models with fixed effects on country. Results from other types of count models, such as the Poisson model, are presented in appendix D. All models are reported with robust standard errors clustered on country in parentheses, and the significance levels are reported with asterisks. The interpretation of count models are done in the same fashion as with other probability models, meaning that the coefficients reported in the regression tables are on the log-scale. Thus, the coefficients should be interpreted as such: with one unit change in the variable of interest, we can expect the value of the coefficient to represent the change in the logs of the expected counts of adopted climate policies when all other variables are held constant (Long, 1997; UCLA: Statistical Consulting Group, n.d.). By taking the exponential of the coefficient, and then calculating the percentage, one can report the percentage change we can expect in the log of the count. This interpretation can be difficult to understand in substantial terms. Because the relationship between the independent and dependent variables depends on the values of the other control variables, it makes the most sense to construct scenarios in order to understand the real relationship (Ward & Ahlquist, 2018, p. 197). First, I will report the regression tables and the interpretation of these. Then I will construct some meaningful scenarios in order to get a better understanding of the implications behind the coefficients from the models.

Bivariate regression models

Table 6.1 presents the results from the most basic negative binomial models. Model 1 presents the bivariate correlation between union density and count of yearly adopted climate policies, which is negative and statistically significant at the highest level. The coefficients suggests that with one unit increase in union density, we can expect a 0.164 decrease in the logs of expected counts of adopted climate policies. The exponential equals about -0.849. This means that model 1 suggests that one unit increase in union density is associated with about a 15% decrease in the log of the count of yearly adopted climate policies. Model 2 shows the correlation between corporatism and the count of climate policies, which is also negative. However, it is not statistically significant.

Table 6.1: Base models: Negative Binomial

	Yearly adopted climate policies					
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	-0.164^{***}		-0.164^{***}	-0.036^{+}	-0.094^{***}	-0.048^{*}
	(0.016)		(0.017)	(0.019)	(0.016)	(0.019)
Corporatism		-0.451	0.181	0.387	-0.164	0.382
		(0.379)	(0.381)	(0.322)	(0.220)	(0.302)
Lagged dependent					0.718^{***}	
					(0.074)	
Timetrend						0.085^{***}
						(0.015)
Constant	2.926^{***}	-0.749^{***}	3.026^{***}	-0.525	0.463	-3.292^{**}
	(0.299)	(0.194)	(0.450)	(0.838)	(0.456)	(1.044)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	Yes	No	No
Standard errors clustered on country	Yes	Yes	Yes	Yes	Yes	Yes
Observations	897	994	851	851	851	851
Log Likelihood	-761.384	-903.816	-718.922	-657.846	-505.139	-689.163
θ	1.991^{***} (0.471)	1.022^{***} (0.176)	2.096^{***} (0.526)	7.054^{+} (3.944)	17.430^{**} (6.059)	3.762^{**} (1.340)
Akaike Inf. Crit.	1,598.769	1,879.631	1,511.843	1,445.692	1,086.277	1,454.326

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Models 3-6 continue the exploration of only the key independent variables of the thesis. The models are still negative binomial models, but this time they contain both union density and corporatism without controls. Model 3 contains country fixed effects, but no other specifications. Model 4 contains both country and year fixed effects. Model 5 is an autoregressive model (AR(1)), and in model 6 I have added timetrend as a control variable. The union density variable stays significant across all these different model specifications, though it varies. An increase in union density is associated with a decrease in the logs of the expected counts of adopted climate policies across all models. The coefficient of corporatism changes notably between different model specifications. It shifts between being positive and negative, but stays insignificant. Based on this very simple first look, it seems as though corporatism is perhaps not a good explanation for the amount of adopted climate policies. Yet, the significance of coefficients might change when other covariates are included. This is because they might remove irrelevant explanatory factors, and show a more clean correlation for said variable (Christophersen, 2018, p. 60). On another note, the results might also indicate multicollienarity, which can lead to unstable results.

Main models without interaction

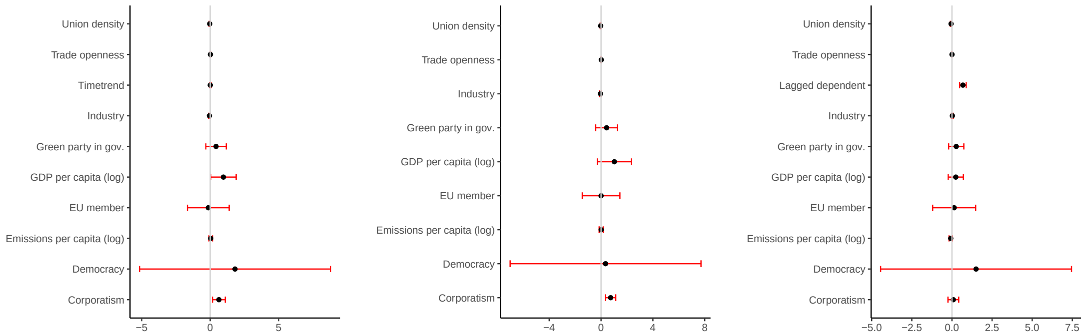
Table 6.2 presents the main models that include the control variables mentioned in chapter 4. Figure 6.5 presents the marginal effects and the related confidence intervals for all variables in each main model. Many of the variables have small confidence intervals, which suggest that the results are quite confident. However, the democracy variable has very large confidence intervals compared to the others. Nevertheless, the results are stable across different models, and the direction of the control variables' coefficients are all in line with what one can expect from theory. The large uncertainty of democracy could indicate multicollinearity, for instance if some of the other variables measure the same underlying concept. The uncertainty could also be caused by little variation amongst the observations in my sample. All OECD countries are democracies,

Table 6.2: Main models: negative binomial models

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend model	FE	AR(1)
	(1)	(2)	(3)
Union density	-0.036^{+}	-0.026	-0.055^{*}
	(0.020)	(0.018)	(0.024)
Corporatism	0.637^{**}	0.742^{***}	0.087
	(0.238)	(0.200)	(0.171)
Logged GDP	0.967^{*}	1.026	0.239
	(0.475)	(0.669)	(0.241)
Democracy	1.813	0.348	1.503
	(3.556)	(3.756)	(3.034)
Logged emissions per capita	0.038	0.011	-0.073
	(0.067)	(0.081)	(0.055)
Industry	-0.058^{+}	-0.043	0.025
	(0.030)	(0.033)	(0.027)
Trade openness	0.016^{*}	0.019^{**}	0.004
	(0.006)	(0.006)	(0.004)
Green party in gov.	0.429	0.432	0.268
	(0.381)	(0.430)	(0.241)
EU member	-0.136	0.003	0.139
	(0.778)	(0.741)	(0.683)
Timetrend	0.005		
	(0.030)		
Lagged dependent			0.683^{***}
			(0.105)
Constant	-14.223^{**}	-13.613^{+}	-9.703^{***}
	(4.614)	(7.462)	(2.799)
Country fixed effects	Yes	Yes	Yes
Year fixed effects	No	Yes	No
Standard errors clustered on Country	Yes	Yes	Yes
Offset specification	Independent years (log)	Independent years (log)	Independent years (log)
Observations	643	643	643
Log Likelihood	-513.407	-491.090	-382.445
θ	6.143^{+} (3.665)	13.092 (13.947)	19.949^{*} (8.565)
Akaike Inf. Crit.	1,108.814	1,114.180	846.889

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Figure 6.5: Marginal effects



Model 1 Model 2 Model 3

and although the degree of democracy might differ between them, they are generally quite similar.

Turning to table 6.2 again, I begin the interpretation of the coefficients in the models. In model 1, I have included the timetrend as an independent variable in order to control for strong time trends in the data. Here, there are a few statistically significant coefficients: union density, corporatism, GDP (log), industry and trade openness. With one unit increase in union density, there is an associated decrease of 0.036 in the logs of expected yearly adopted climate policies. This equals about a 3.5% decrease when other variables are held constant, which is considerably lower than in the models without control variables. The coefficient of corporatism suggests a positive relationship with the amount of adopted climate policies. This translates to an increase of about 89% in the log of expected counts of adopted climate policies with each unit increase of corporatism, when all other variables are held constant. Similarly, one unit increase in logged GDP suggests an increase of about 163% in the expected count of adopted climate policies, and one unit increase in trade openness suggests about a 1.6% increase in the dependent variable. When the dependence of industry for the economy increases with one unit, the expected decrease in the count of yearly adopted climate policies equals around 5.6%.

Model 2 includes fixed effects on both country and year. In this model, there are less statistically significant coefficients. This can in part be due to the fact that a two-ways fixed effects model is quite conservative compared to the other models that have been tested here. Corporatism stays significant and stable, and suggests about a 110% increase in the log of expected counts of newly adopted climate policies. The only other significant coefficient is that of trade openness, which suggests about a 1.9% increase. Model 3 is an AR(1) model, where a lagged version of the dependent variable is included as a covariate. In this model, the only statistically significant coefficient is that of union density. With one unit increase in union density, there is an expected decrease in the log of the expected count of newly adopted climate laws by -0.055. This translates to about a 5.3% decrease. Because this is an autoregressive model, the outcome depends on the previous data in the sample. This means that the dependent variable is dependent on the independent variables and on the previous values of the dependent variable (Stephanie, 2015). In this case, model 3 is a first order autoregressive model, which means that a one year lag of the dependent variable is included as a predictor. The third model is, according to the AIC and the log likelihood, the best fitted one. However, the different models help alleviate different concerns. The rootograms, reported in appendix E, suggest that model 3 is not the best model. The rootograms suggest that model 1 and model 2 are the more preferable models.

The correlation between union density and count of climate policies stays significant in model 1 and model 3. An interesting change from the bivariate regressions, is that the coefficient of corporatism has turned positive in all models and is significant in models 1 and 2. Besides this, there are not many significant covariates in the models. However, those that are have expected directions. In sum, two out of three main models lend support to hypothesis H_1, that there is a relationship between union density and the amount of newly adopted climate policies. Further, the models suggest that out of the two competing hypotheses that follow, it seems that hypothesis H_{1a} is correct. Although there was no bivariate correlation between corporatism and the dependent variable, this changed when covariates were added. The coefficient is positive in all of the models, and in two of the models it is significant. This suggests that corporatist systems might have some preferable characteristics for the adoption of climate policies. It could be that the positive characteristics of corporatist systems moderate the negative effect of union density. This is something that I will discuss further when exploring the conditional hypothesis H_2.

6.1.1 Conceptual interpretation

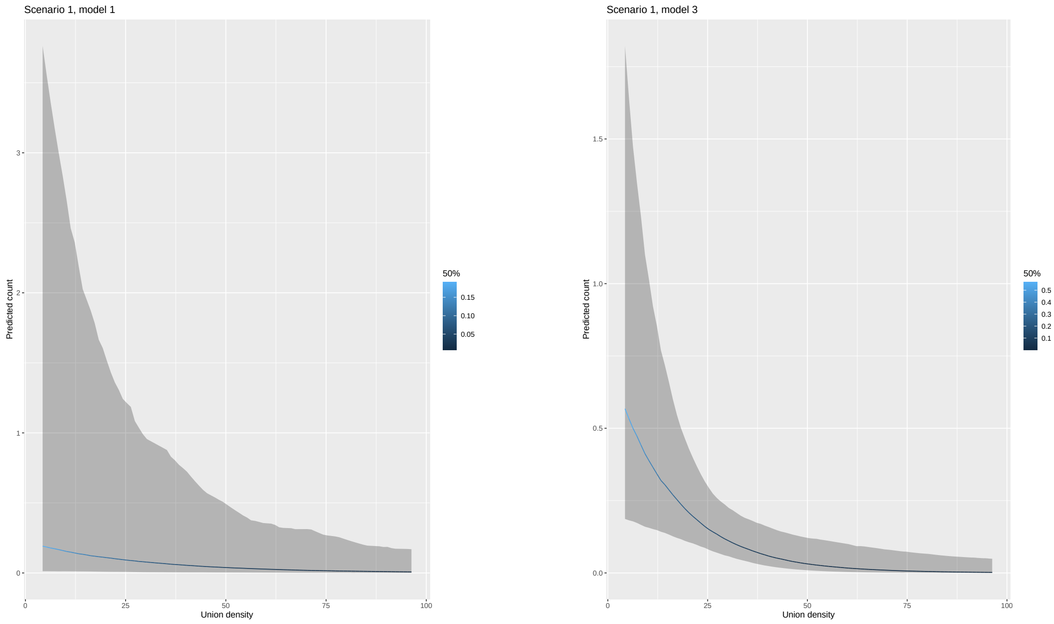
In order to further investigate the implications of the models for hypothesis H_1, I now turn to figure 6.6. Here scenarios based on model 1 and model 3 from table 6.2 are presented. By analyzing these scenarios, it is possible to get a substantial understanding of the models where the coefficient of union density is significant. This is because the negative binomial model is a probability model[3], and the coefficients from table 6.2 cannot be interpreted in the same way as the coefficients of an OLS model. The figures show the predicted count of adopted climate policies on the y-axis, over different values of union density on the x-axis. As mentioned earlier, the relationship between these variables depends on the other variables in the model. Thus, other continuous variables are kept at a mean value and discrete variables are kept at zero.

The scenarios constructed from the two models yield similar results as table 6.2. What quickly becomes evident, however, is that the predicted outcome does not differ much along the different values of union density. There is a slightly higher likelihood for country-years with lower union density to adopt more climate policies. However, it is not by much. Model 1 estimates that countries with a labor union density of around zero do not even reach one newly adopted climate policy. The prediction is that countries in that situation adopt about 0.2 policies. Moreover, the relationship decreases quickly and as labor union density reaches around 30%, the predicted count of newly adopted climate policies equals zero. Thus, even though the regression table illuminates a statistical relationship between union density and climate policymaking, this relationship does not seem very strong when looking at the predictions from the models. Moreover, the uncertainty presented by the confidence intervals in grey are quite high. For countries with a labor union density of around zero, the actual amount of adopted climate policies can be anything between zero and above three.

The right side figure in figure 6.6 presents the results from model 3. This scenario suggests a stronger relationship between labor union density and the amount of adopted climate policies than the scenario based on model 1. Countries with labor union density around zero are predicted to adopt about 0.5 climate policies. This effect decreases when labor union density reaches about 50%. The decrease is steeper than suggested by model 1, and the confidence

[3] I have chosen to not make scenarios based on model 2 because the coefficient of labor union density is not significant in this model

Figure 6.6: Predicted counts of yearly adopted climate policies over the range of union density



Model 1 Model 3

intervals are noticeably smaller in the scenario to the right. Moreover, they do not reach zero. Thus, model 3 predicts more securely that countries with a union density below about 50% will adopt more climate policies than those with a higher union density. The upper band of the confidence interval suggests that the amount of adopted climate policies for countries with a union density below 20% might reach as many as two, while the lower band suggests 0.2. The weaker relationship between labor union density and climate policy adoption that is suggested by these models does not necessarily mean that unions are unimportant for climate policymaking. Even if the variable does not seem to have a strong explanatory effect for the amount of climate policies a country-year adopts, they might be important for dynamics that are not easily seen in statistical analysis. Moreover, it may be that perhaps unions are more important for the content of climate policies than for the adoption of them. This has been suggested by other scholars who utilize the distributive conflict theory. In appendix D, it becomes evident that labor union density does not correlate with the dichotomous operationalization of climate policy adoption. The coefficient points in the same direction as for the count models, but the results are not significant. This points to the fact that labor organizations might be more important for the adoption of more than one climate policies. Scenarios where I present the model predictions over other variables than labor union density can be seen in appendix C.

6.1.2 Interaction effects

Table 6.3 presents the results of the conditional negative binomial models. The models include the same variables as the ones seen in table 6.2, but this time I have added an interaction term between union density and level of corporatism, as were suggested in H_2. In other word, as hypothesized, I test whether the relationship between union density and the amount of yearly adopted climate policies depend on the level of corporatism. Model 1 suggests that logged GDP is negative and significant at the 10% level, and that degree of democracy and trade openness are both positive and significant at the 5% level. Model 2 suggests that trade openness is positive

Table 6.3: Main models with interaction effects

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	-0.036^{+}	-0.027	-0.058^{**}
	(0.020)	(0.019)	(0.022)
Corporatism	0.621	0.568	-0.649
	(0.536)	(0.573)	(0.427)
GDP (log)	-0.058^{+}	-0.043	0.026
	(0.030)	(0.032)	(0.026)
Democracy	0.967^{*}	1.030	0.250
	(0.478)	(0.673)	(0.232)
Emissions per capita (log)	1.826	0.470	2.113
	(3.436)	(3.707)	(2.790)
Industry	0.038	0.008	-0.079
	(0.068)	(0.083)	(0.056)
Trade openess	0.016^{*}	0.019^{**}	0.003
	(0.006)	(0.006)	(0.004)
Green party in gov.	0.429	0.425	0.254
	(0.386)	(0.432)	(0.245)
EU member	-0.135	0.035	0.216
	(0.758)	(0.726)	(0.675)
Timetrend	0.005		
	(0.030)		
Lagged dependent			0.698^{***}
			(0.104)
Interaction: union density and corporatism	0.0005	0.005	0.022^{+}
	(0.015)	(0.015)	(0.012)
Constant	-14.244^{**}	-13.809^{+}	-10.520^{***}
	(4.699)	(7.607)	(2.690)
Standard errors clustered on country	Yes	Yes	Yes
Observations	643	643	643
Log Likelihood	-513.407	-491.062	-381.915
θ	6.139^{+} (3.661)	12.836 (13.439)	17.003^{**} (6.478)
Akaike Inf. Crit.	1,110.814	1,116.125	847.829
Note:	+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001		

and significant at the 1% level. Besides this, the control variables are not significant.

It is important to note that the interpretation of the coefficients in a model with interaction effects differs from unconditional models. Now the coefficient of union density represents the relationship with the amount of climate policies adopted in a country-year when the degree of corporatism equals zero. The coefficient of corporatism represents the relationship with the amount of adopted climate policies when the union density equals zero (Brambor, Roberts, & Golder, 2006, p. 72). None of the models suggest a significant relationship of corporatism with the number of adopted climate policies when union density equals zero. Model 1 and model 3 suggest that union density correlates with the amount of adopted climate policies when the level of corporatism equals zero. In model 1 the coefficient is negative and significant at the 10% level, and indicates that when the level of corporatism equals zero, one unit increase in union density is associated with about a 6.4% decrease in the log of adopted climate policies that country-year. In model 3 the coefficient is negative and significant at the 5% level, and indicates that when the level of corporatism equals zero, one unit increase in union density is associated with about a 3.5% decrease in the log of adopted climate policies that country-year. A value of zero in the degree of corporatism means a medium value of corporatism.

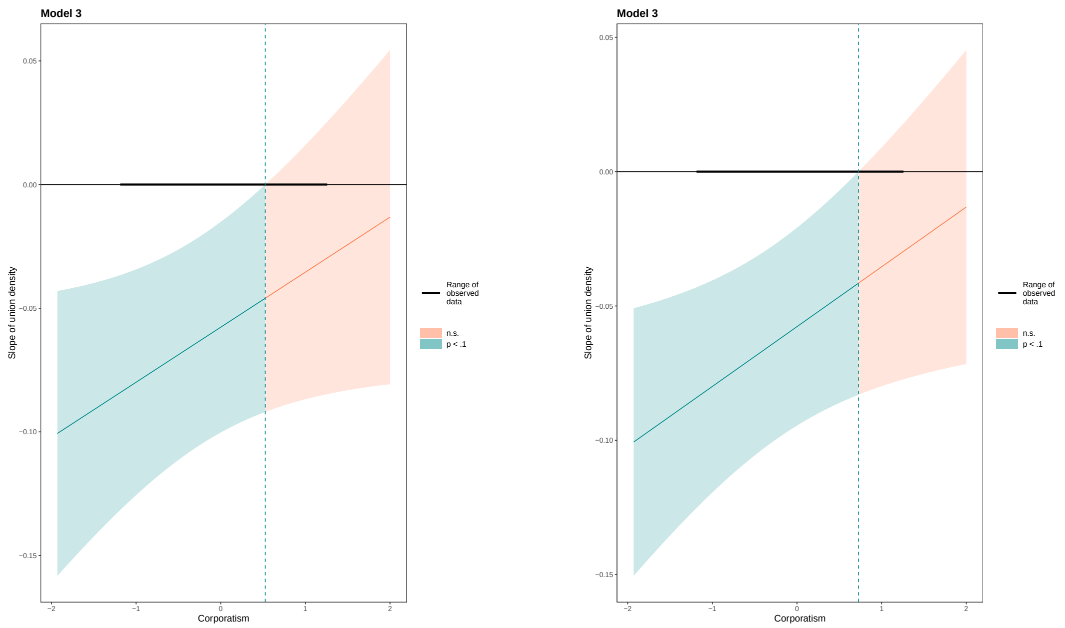
Model 1 and model 2 suggest a non-significant interaction between union density and the level of corporatism. However, model 3 suggests that the interaction term is positive and significant at the 10% level. This should be investigated further, but this cannot be done just by looking at the table. In order to do so I need to check if only certain values of the two continuous variables interact. By doing this, it is possible to get a better understanding of the specific interaction effect, and determine exactly at which levels of corporatism that the slope of union density is significant (Brambor et al., 2006, p. 75). To do so, I plot the estimate of union density across the values of corporatism, presented by the calculation of the so-called Johnson Neuyman interval (Lin, 2020; Brambor et al., 2006, 76)[4]. Figure 6.5 shows the interaction term from model 3 from table 6.3. The figure to the left is calculated with the more conservative suggestions for calculating uncertainty, which has been suggested by Esarey and Sumner (2018) in the R-documentation of the function. Evidently, the difference is very small. The blue part of the plots represent where the slope of union density, represented by the y-axis, is significant at the 10% level along the range of corporatism, represented by the x-axis. As expected from the theoretical assumptions, the coefficient of union density is conditional on the level of corporatism. Corporatism seems to moderate the negative association of union density on adopted climate policies. When corporatism is between -2 and 0.5, the slope of union density is significant at the 10% level, but the upper confidence intervals cross the zero line, and thus is insignificant, above 0.5. This means that when countries have a level of corporatism that exceeds 0.5, the (negative) relationship between union density and the amount of adopted climate policies in a country-year is no longer significant. Union density stops having a significant reductive effect on the number of adopted climate policies when the levels of corporatism are high.

Although there are some significant results from these models, most of the coefficients are insignificant. Surprisingly, corporatism seems to be less important for the relationship between union density and the amount of adopted climate policies in a country-year than what was suggested by theory. However, these results might be caused by the way that corporatism has been operationalized. Moreover, constructing an index might gloss over some important implications

[4]This calculation can be used for many model types, and is also suitable for exponential models such as the negative binomial model (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4335806/) because it plots the coefficient of union density across the actual values of corporatism

that the different components of the index could have for this relationship. In table C.8 to C.11, the negative binomial models of table 6.3 have been tested with these components instead of the index in order to better understand exactly which characteristics of corporatism that are more important predictors. Some of these coefficients seem to have important explanatory factors. The coefficients of centralization of bargaining are significant across all three models, and so are the interaction terms. Also sectoral organization is significant in all models, a result that also applies to the interaction terms. Furthermore, extension of bargaining, and the interaction with union density, are significant in model 1 and model 2. Level of wage bargaining and the interaction with union density are significant in model 3. Likewise, wage bargaining coordination, and the associated interaction with union density, is significant in model 3. All of these indicate the association of the respective variables with the amount of climate policies that are adopted in a country-year if union density equals 0. The coefficient of union density keeps it's direction, and is mostly significant in all these models, and indicates the relationship between union density and the amount of adopted climate policies when the corporatism component in the model equals 0. A look at table 4.2 shows what zero means for all these variables. Figure C.1 to C.5 shows the slope of union density across the values of these corporatism components, and shows where the slope of union density is significant.

Figure 6.7: Interaction plots, model 3



More conservative calculation of uncertainty

Less conservative calculation of uncertainty

Robustness checks

In order to assess the robustness of my results, I have tested different model specifications as well as different model fits. These can be seen in appendix C and D. Overall, I conclude that the results are only moderately robust across different models and specifications. Because the dataset is relatively small, the results might differ more across models now, compared to if it had contained more observations. However, sensitivity tests, such as running the model without outliers, indicate that the results for the variables of interest hold. In tables C.16 to C.21, I present results from the main models when the independent variables are lagged with 1, 2 or 3 years. The purpose of this is to capture relationships that might not be immediate, such as could be the case for the relationship between interests, institutions and the adoption of climate policies. When lagging the independent variables the results are no longer significant. This suggests that the relationship between climate policymaking and labor union density presents itself rather quickly.

Additionally, I have tested other operationalizations of independent and control variables, as well as tested if the results are similar for adoption of international agreements (such as the Kyoto protocol). Other models have also been tested. The Poisson model is a natural place to begin when exploring count models, and yield similar results as the negative binomial models in my case. Comparing the AIC of the models suggested that the negative binomial models are a better fit. The rootograms, which can be seen in appendix E, suggest that there is not a huge difference, but that this suspicion is supported. One important difference is that the union density variable and the interaction term are not significant in the Poisson models in the conditional models. In the unconditional Poisson models, the union density variables are mostly significant. As mentioned, the logistic regression model did not yield significant results for the variables of interest. This could indicate that the results are not robust, but it could also be that union density and corporatism are more important for predicting the amount of adopted climate policies rather than adoption of policies alone. The hurdle model yields non-significant results, but might not be a good model fit. However, it indicates less robust results.

6.2 Summary

Previous literature, about both labor unions and corporatism in relation to climate or environmental policymaking, points in different directions. Thus, my aim has been to take one step back in order to illuminate the relationship with statistical evidence. My research question sounded *Is the size of labor organizations associated with the amount of adopted climate policies? If so, does this depend on formalized access to policymaking?* Based on this, I formed two main hypotheses with three belonging sub-hypotheses. My goal has been to test (1) if union density is associated with the amount of yearly adopted climate policies, (2) which direction this potential relationship has, and (3) whether the potential relationship is affected by degree of corporatism. My findings suggest that there is a negative relationship between union density and the amount of adopted climate laws, a result that is relatively stable across different model specifications. This suggests that labor organizations might be interest groups that, because of their purpose of protecting worker's rights, somehow work against climate policymaking. However, when looking at the conceptual understanding of my models by constructing scenarios, the result is not particularly impressive. Having low union density is not even associated with one whole climate policy adopted in any of the main models.

When it comes to corporatism, the results are rather unstable. In the cases of significant results, the association seems to be positive, but this is a lot less stable across different model specifications than labor union density. Moreover, the interaction term is only significant in one of the main models. None of the additional tests produce significant nor stable results. The lack of significant results could mean that the system of interest representation is of less importance than assumed, and that it is the size or presence of interests that matter in the case of climate policies. However, a look at models where only the components that the corporatism index consists of are included hints to something else. A few of these variables are stable and significant across model specifications, which suggests that certain aspects of corporatist systems might be of importance.

Thus, I have found partial support for hypotheses H_1 and H_{1a}, as well as partial support for hypothesis H_2. However, the results can only highlight a statistical correlation that might in reality be caused by other factors. Further research is needed in order to fully understand what lies behind the relationship. Getting insignificant results does not mean that there is no real relationship between the variables in reality. Even when no strong trends are seen in statistics, it does not mean that they do not exist. The phenomena that occur in real life may be difficult to capture with numbers. Moreover, the results could be affected by model choice and fit or by the chosen operationalization of the concepts. In this thesis, that is particularly true for the unstable results that are produced for the corporatism index, proven both by the main results and the additional tests of the components of the index.

Table 6.4: Summary of results

Hypothesis	Result
H_1: *There exists a relationship between labor union density and the amount of newly adopted climate policies*	Partially supported
H_{1a}: *Labor union density is negatively correlated with the amount of newly adopted climate policies*	Partially supported
H_{1b}: *Labor union density is positively correlated with the amount of newly adopted climate policies*	Rejected
H_2: *The relationship between labor union density and the amount of yearly adopted climate policies depends on the level of corporatism*	Partially supported

Chapter 7

Discussion and conclusion

In this thesis, I have studied the link between labor organizations, systems of interest representation and climate policymaking. Earlier studies are divided in their view of labor unions' role in climate policymaking. Motivated by diverging and inconclusive results within the literature, I have utilized distributive conflict theory to hypothesize a relationship between the variables of interest. According to the theory, labor unions mostly work as climate policy opponents. This is because they are concerned with employment protection and economic growth in order to satisfy the interests of their members. In systems where labor unions have particularly strong positions in policymaking, such as corporatist systems, their ability to oppose climate policies might be enhanced. On the other side, corporatist systems exhibit a few characteristics that are often argued to conciliate in the presence of distributive conflict. Moreover, scholars do not agree that labor unions are necessarily climate policy opponents, and point to a number of different climate measures that labor unions have implemented in order to prove a positive relationship. As such, my goal has been to take one step back in order to see the bigger picture and determine whether a general trend can be seen for OECD countries. I have found partial support for my hypotheses, and the ones that receive support align with the assumptions derived from the distributive conflict theory to a large degree. Thus, when describing what lies behind domestic climate action and inaction in industrialized democracies, this theory seems to contribute with useful discussions about the issues for climate policymaking within these countries.

Hypothesis H_1 assumed that there is a relationship between labor union density and the amount of adopted climate policies. A significant relationship was found in two out of three main models, as well as for a few of the additional tests. As such, it receives partial support. Moreover, the direction of this relationship is negative, which is in line with hypothesis H_{1a}. Even for the models where the relationship is not significant, it is negative, which indicates a relatively robust association of higher union density with fewer adopted climate policies. Nevertheless, I say that the hypothesis is partially supported due to the insignificance of the results from certain models. Hypothesis H_{1b}, which assumed a positive relationship, can be rejected based on the non-presence of positive coefficients across all models. From these results, labor unions seem to be interest groups that work primarily as climate policy opponents. Distributive conflict theory suggests that this is due to the distributional nature of climate change policies which leads to conflicts about which groups should be imposed with costs and benefits. In order to mitigate climate change, production patterns need to change, and thus many jobs are exposed. Climate policies obviously aim to make changes in production happen, and labor unions will therefore need to work against these policies in order to protect the rights and interests of their members. While labor unions with good coverage have been important drivers for the development of social and economic policies, the same cannot necessarily be said about their role in climate policymaking. It could be that this group represents characteristics with industrialized democracies that must change in order for efficient climate change action to take place.

However, there are a few limitations to my findings related to this relationship. First, the conceptual understanding of my main models indicate that the relationship between union density and the amount of adopted climate policies is not very strong. At the highest, the models predict that countries with lower union density adopt 0.5 climate policies, compared to none for the countries with higher union density. In some models, I cannot even be certain that there is a difference in the amount of adopted climate policies for countries with higher or lower union density due to uncertainty in the data. Thus, there may be factors other than labor unions which are more important when explaining domestic climate policymaking within the OECD countries. Moreover, a related point is that unions are not all the same. It is unlikely that labor unions who represent workers in the renewable energy or service sectors have the same reasons to oppose climate policies as those who represent high-carbon sector workers. The weak conceptual relationship indicated by the main models could thus be caused by measuring labor union density as a whole instead of looking at labor union density in different sectors. In the OECD countries that are included in my sample, the most well-organized sectors are, in fact, the high-carbon sectors. These are also the sectors that seem to be the most present in my data. Therefore, what I have been measuring is, perhaps, the implications of a well-organized high-carbon sector for climate policymaking. Although the results are not as conclusive as I hoped, the analysis highlights some very interesting implications of labor union density, and, at least to some extent, supports the theoretical assumptions.

Labor union density does not grant a full picture of the strength of labor unions in policymaking alone. With hypothesis H_3 I presented an expectation that the relationship between labor union density and the amount of adopted climate policies depends on the level of corporatism. This is based on the fact that corporatist systems often include bigger interest groups, such as labor, almost automatically. Either this would enhance the negative relationship that I have uncovered, or this relationship will diminish as a result of cooperation. Again, I find partial support for this hypothesis. One out of three main models indicate a significant interaction term. The significant interaction term suggests that the level of corporatism moderates the negative effect of labor union density on the amount of adopted climate policies. The relationship turns less negative as the level of corporatism goes up, and after reaching a moderately high level of corporatism the relationship is no longer significant. This lends support to the idea that corporatist systems have some mediating effects on distributive conflict, but also suggests that labor union density is not a strong predictor for the amount of adopted climate policies in systems with high levels of corporatism. Distributional conflict theory suggests that corporatist systems often have more climate policies than others because the characteristics of the system make cooperation more available for the involved groups. This is supported to a degree, but the relationship between labor union density and the amount of adopted climate policies never turns positive before it turns insignificant. Moreover, the result does not hold for many of the additional tests, which indicates less robust results than for hypothesis H_1. However, when looking at the different components of the corporatism index, many of the variables have significant interaction terms across all the main models. I choose to interpret this as support for the hypothesis.

Thus, my findings align somewhat with the observations that Gronow et al. (2019) make: that corporatism is perhaps not a well enough defined concept for exploring climate change policymaking. However, this does not mean that characteristics associated with corporatist systems are not useful in analysis. Instead, it highlights that studying institutions can be difficult because the definitions are not precise or limited enough. By exploring the different components that make up the corporatism index I utilize in the main models, I find that there are strong results for the interaction effect of many of them. Most of them seem to have the same moderating effect as the corporatism index on the relationship between labor union density and the amount of adopted climate policies. However, there is one exception. As the extension of bargaining increases, the negative effect of labor union density on climate change policies seems to be enhanced instead of moderated. In fact, in countries where mandatory extension of collective agreements are available and regularly applied, the amount of adopted climate policies are more negatively affected by higher labor union density compared to places where this is not the case. This could be because labor unions might have more power in policymaking in such systems, but it could also indicate that the countries have stronger employment protection policies. In that case, it is not necessarily the labor unions themselves that work against climate policies on behalf of employment protection, but instead the institutional characteristics that work against policies that affect jobs and make it more difficult to change production. Moreover, even though many of the components, such as sectoral organization, moderate the negative effect of labor unions on the amount of adopted climate policies, the relationship does not turn positive along the changes in the values of the components. As such, there is support for a moderating effect of corporatism on the relationship between labor union density and the amount of adopted climate policies, but the moderation has limits. In fact, it is only centralization of bargaining, in model 2, that suggests a positive relationship between labor union density and the amount of adopted climate policies at the highest levels of the component. This could indicate that the distributive conflict that is associated with the relationship between labor unions and climate policymaking is moderated considerably in systems where bargaining is centralized.

Exactly what lies behind the relationships that I have uncovered should be left to in depth studies. Nevertheless, my findings indicate some important correlations that definitely should be explored further. The implications of these relationships have a large range. It would be easy to claim that my findings mean that labor unions should not be involved in climate policymaking. However, I do not believe that social policies should be totally divided from climate change policies. This would be difficult to argue for many reasons. What my findings highlight is that there are changes needed in the way we make climate policies in industrialized countries. These changes are not only related to the way that some labor unions work against them. Changes in production will not only affect jobs, but the economy as a whole. This is not something that is possible to avoid, and we do not have the time to keep dwelling on these issues. Instead, it is necessary to redirect the discussion about climate policies so that a greater focus lies on finding better solutions for compensation for those who are affected. This will more efficiently moderate the distributional conflict that arises. Moreover, we need to find ways to utilize the competence, abilities and knowledge of workers in high-carbon sectors in low-carbon sectors instead. What is needed in order for this to happen is not a reduction in labor union organization as a whole, but perhaps more labor union organization in new sectors to counterbalance against those in old sectors and make the jobs of the future more appealing. Climate change is an issue that relies more on political will than a lack of knowledge from the scientific community. The international community in general, and the industrialized economies in particular, need to find out how to limit the importance of political will in order for meaningful climate change policies to be implemented soon.

7.1 Future research

My thesis has begun exploring only a small part of the relationship between labor unions, institutions and climate policymaking. Some interesting correlations have been uncovered, but there are still many explanations that remain uncovered and questions that remain unanswered. As mentioned in the previous discussion, a closer look at the implications of labor unions in different sectors would be a natural next step. Are industrial labor unions in fact more likely to be climate policy opponents than labor unions in other sectors? Does that mean that labor unions in other sectors potentially work as climate policy proponents? These questions, of course, call for more data in order to provide clear answers. Moreover, a further focus on institutional characteristics, such as the components from the corporatism index, could be important in order to uncover different dynamics.

Looking at other related interest groups, such as business interests may also be important to fully understand the extension of the distributional conflict of climate change policies. It is not only jobs that will be affected, but also the general economy. Many powerful people will lose money, and some would perhaps argue that business interests are therefore more likely to be an issue for the adoption of climate policies than the influence of labor unions. Exploring other cross-class coalitions could also be fruitful. How do climate policy opponents receive power in policymaking processes? In order to highlight these concerns in a quantitative manner, more data and meaningful operationalizations are needed. However, perhaps statistics are not suitable for answering such interrelated processes. Thus, further studies on these particular issues could benefit from a more qualitative nature. Or, more likely, perhaps both qualitative and quantitative studies are needed.

Distributive conflict theory has some interesting assumptions about the implications for climate policies that do not only apply to the amount of adopted climate policies. For instance, I am not looking at the contents of climate policies. Other scholars who utilize the same theory, such as Finnegan (2019) and Mildenberger (2020), argue that the climate policies in corporatist systems are more often directed at the consumers rather than the producers. In addition, the policies are assumed to be less stringent than in systems where labor unions and other carbon intensive interests are not as involved in climate policymaking. This, in addition to a look at the quality of climate policies, could also be a natural next step. All of these potential studies need thorough work with the operationalization of the central terms, at least for future quantitative studies.

In addition to all the mentioned suggestions for further studies, a survival analysis of the available climate policies could be of interest. I have only focused on the adoption stage of policies. Some climate policies have been revoked after their adoption, and whether labor unions have any importance for these events could uncover some additional implications of their role in climate policymaking. Moreover, I am not able to say anything about causal mechanisms. Correlations uncovered in my data cannot be securely explained, except through my own theoretical assumptions. Is the relationship that I have uncovered between labor unions and the amount of adopted climate policies causal? If so, exactly how do unions work to block climate policies? These are challenging questions to answer, but nevertheless important to determine in order to figure out ways to make efficient climate policies in the near future.

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Appendix A

Operationalizations

In this appendix, I present the operationalizations of the main variables used in the analysis. For the key variables, i.e. the dependent and the two main independent variables, the descriptions can be found in table A.1. Table A.2 presents the operationalizations of control variables.

Table A.1: Operationalization of control variables

Contextual name of variable	**Description**	**Measure**	**Variable name in dataset**	**Source**
Climate change policies	The outcome of policymaking processes where the goal is related to climate change mitigation. *Dependent variable.*	Count of adopted climate policies in a country-year.	count1 (New_law for dichotomous version)	Climate Change Laws of the World database
Size of labor unions	Size of labor unions, or the amount of employed people who are members of trade unions. Assumed that higher membership leads to more influence because unions represent workers, have higher manpower for strikes, and most likely better financial situations. If labor unions have anti-climate policy stances, they will correlate negatively with amount of adopted climate policies. If labor unions have pro-climate stances, then they can have the opposite effect. Also assumed to interact with corporatism, as a system of interest representation.	Union density. The number of employed union members as a percentage of all employed people in a country-year.	UD	ICTWSS/Visser (2019) and ILOSTAT (2021)/OECD Labor Force Statistics
Degree of corporatism	Corporatism refers to institutions where certain interest groups, such as bigger labor unions, have institutionalized access to policymaking. It is also characterized by concertation, and a number of other factors. It is assumed that higher levels of coporatism strengthens the position of labor unions by giving them greater influence on policymaking through automatically being represented. Either corporatism can strengthen unions and thus forward distributive conflict, or corporatism can moderate the distributive conflict due to a cooperative environment.	Corporatism index	CorpAll	Updated version of Jahn (2016) and ICTWSS/Visser (2019)

Table A.2: Operationalization of control variables

Variable name in dataset	**Description**	**Measure**	**Number of observations**	**Source**
Industry	Importance of industrial production for a country's economy, which is assumed to correlate negatively with the amount of climate policies	Industry as a % of GDP	N = 1861	The World Bank
logGDP	GDP per capita (logged). This is assumed to correlate with the amount of climate policies. Meant to measure a country's income.	USD (American dollars), measured at current prices and PPP's.	N = 1475	OECD
logemissions	All GHG emissions per capita (logged).This is assumed to correlate with the number of climate policies	Total emissions divided by population in a country year.	N = 1475	Our World in Data (emissions) and the World Bank (population)
trade	Trade openness. Meant to measure economic dependency on trading, and the connection to other countries in a country year.	Trade as % of GDP	N = 2602	the World Bank
environshare	The number of green parties that have any share of the seats in Parliament in that election period. Assumed to reflect more concern for climate change, and to affect climate policies.	Count of environmental parties with any share of seat in Parliament	N = 3245	Based on the V-party dataset
EUmember	An indication of whether a country was a member of the European Union in a given year. Assumed to correlate with climate policies because the EU is considered an international climate proponent.	Dichotomous variable	N = 3245	Based on information from the European Union (2021)

Dem	Level of democracy is assumed to correlate with the number of climate policies	Index that ranges from 0-1	N = 1856	V-dem
Indep	Variable that counts how many years a country have been independent (since 1960). Countries that have been independent longer have had more chances to adopt climate policies, while countries that have recently become independent might adopt more policies at once than what is usual. *This variable is specified as an offset in the count variables, but is not included as a "regular" covariate because of multicollinearity issues.*	Cumulative count of independent years	N = 3245	Based on the V-dem dataset
kyoto_member	Indicates the status of a country in relation to the Kyoto Protocol. Used as an alternative dependent variable in additional tests, but not included in main models because of reversed causality issues. It is assumed that there might be correlation between the number of national climate policies and ratification of the Kyoto Protocol. Simultaneously, the same mechanisms might be behind signature or ratification of international climate agreements as for national climate policies.	1-4, where 1 indicates irrelevance or that a country has not signed the agreement that year. 2 indicated a signature, 3 indicates ratification, and 4 means that the agreement has entered into force.	N = 3245	Based on the International Environmental Agreement database (2021)

Appendix B

Descriptive statistics

In this appendix, I present basic descriptive statistics. Table B.1 presents the countries that are included in the regression analysis. Because of missing values, the total number of countries are 30 OECD countries. Table B.2 presents the correlation matrix for the variables used in the main models, as well as alternative operationalizations. Table B.3 shows the descriptive statistics of the same variables. Table B.4 shows the descriptive statistics of the variables that are used in the corporatism index specifically. Table B.5 presents the main negative binomial models with only the covariates. Tabel B.6 and B.7 presents more information about union density for the countries in the dataset.

Table B.1: Countries included in analysis

Austria	Belgium	Canada	Chile	Czechia
Denmark	Finland	France	Germany	Greece
Hungary	Ireland	Israel	Italy	Japan
Latvia	Lithuania	Luxembourg	Mexico	Netherlands
New Zealand	Norway	Poland	Portugal	Slovenia
Spain	Sweden	Switzerland	Turkey	United Kingdom
SUM:				**30 countries**

Table B.2: Correlation matrix

	Union density	Corporatism	Industry	Green party in gov.	Green party vote	Kyoto protocol membership	EU membership	Emissions per capita (log)	Democracy	Independent years	Trade openness	GDP per capita (log)	Fossil fuel producer	Fossil fuel exporter
Union density	1	0.528	-0.047	0.399	0.377	-0.172	0.078	0.054	0.230	-0.078	0.043	0.303	-0.134	0.070
Corporatism	0.528	1	-0.065	0.484	0.395	0.041	0.531	-0.002	0.455	-0.033	0.226	0.483	-0.071	0.011
Industry	-0.047	-0.065	1	-0.192	-0.205	-0.152	-0.376	-0.289	-0.125		-0.215	-0.408	0.036	-0.078
Green party in gov.	0.399	0.484	-0.192	1	0.925	0.176	0.336	0.034	0.222	0.068	0.271	0.449	-0.189	0.082
Green party vote	0.377	0.395	-0.205	0.925	1	0.123	0.255	0.135	0.237	0.075	0.201	0.447	-0.128	0.145
Kyoto protocol membership	-0.172	0.041	-0.152	0.176	0.123	1	0.190	-0.032	0.137	0.131	0.193	0.347	0.054	0.087
EU membership	0.078	0.531	-0.376	0.336	0.255	0.190	1	0.064	0.324	0.117	0.315	0.327	-0.021	0.135
Emissions per capita (log)	0.054	-0.002	-0.289	0.034	0.135	-0.032	0.064	1	0.230	-0.003	0.154	0.339	0.057	0.187
Democracy	0.230	0.455	-0.125	0.222	0.237	0.137	0.324	0.230	1	0.041	0.129	0.447	-0.065	0.097
Independent years	-0.078	-0.033		0.068	0.075	0.131	0.117	-0.003	0.041	1	-0.022	0.116	0.106	0.117
Trade openness	0.043	0.226	-0.215	0.271	0.201	0.193	0.315	0.154	0.129	-0.022	1	0.262	-0.336	-0.205
GDP per capita (log)	0.303	0.483	-0.408	0.449	0.447	0.347	0.327	0.339	0.447	0.116	0.262	1	-0.095	-0.012
Fossil fuel producer	-0.134	-0.071	0.036	-0.189	-0.128	0.054	-0.021	0.057	-0.065	0.106	-0.336	-0.095	1	0.535
Fossil fuel exporter	0.070	0.011	-0.078	0.082	0.145	0.087	0.135	0.187	0.097	0.117	-0.205	-0.012	0.535	1

Table B.3: Descriptives of independent variables

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Union density	897	32.069	22.218	4.300	16.100	41.600	97.200
Corporatism	994	−0.094	0.753	−1.263	−0.778	0.543	1.341
Industry	863	28.831	5.732	11.951	24.627	32.613	44.738
Green party in gov.	1,073	0.433	0.556	0	0	1	2
Green party vote	1,073	0.480	0.587	0	0	1	2
Kyoto protocol membership	1,073	2.411	1.331	1	1	4	4
EU membership	1,073	0.475	0.500	0	0	1	1
Emissions per capita (log)	1,017	−11.602	0.634	−18.029	−11.932	−11.272	−10.229
Democracy	943	0.846	0.086	0.283	0.840	0.888	0.919
Independent years	1,072	0.985	0.121	0.000	1.000	1.000	1.000
Trade openness	1,054	85.045	52.149	16.014	53.390	104.592	408.362
GDP per capita (log)	951	9.924	0.879	7.069	9.457	10.575	11.689
Fossil fuel producer	1,073	0.609	0.488	0	0	1	1
Fossil fuel exporter	1,073	0.476	0.500	0	0	1	1

Table B.4: Descriptives of corporatism variables

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Centralization of bargaining	648	0.523	0.260	0.085	0.324	0.709	1.221
Work council structure	933	2.108	1.420	0.000	1.000	3.000	4.000
Work council rights	933	1.322	1.018	0.000	0.000	2.000	3.000
Government intervention	1,002	2.105	1.160	1.000	1.000	3.000	5.000
Level of wage bargaining	1,032	2.276	1.212	1.000	1.000	3.000	5.000
Involvement of labor organizations	941	1.007	0.768	0.000	0.000	2.000	2.000
Wage bargaining coordination	1,031	2.445	1.361	1.000	1.000	4.000	5.000
Extention of bargaining	1,060	1.405	1.148	0.000	0.000	3.000	3.000
Sectoral organization	933	0.877	0.911	0.000	0.000	2.000	2.000

Table B.5: Negative binomial: only control variables

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend model	FE	AR(1)
	(1)	(2)	(3)
Logged GDP	0.969*	0.678	0.670**
	(0.431)	(0.520)	(0.223)
Democracy	4.010*	3.240	1.679
	(2.036)	(2.018)	(1.298)
Logged emissions per capita	0.107	0.042	−0.004
	(0.100)	(0.103)	(0.067)
Industry	−0.042	−0.022	0.018
	(0.031)	(0.030)	(0.024)
Trade openness	0.011*	0.012**	0.004
	(0.005)	(0.005)	(0.003)
Green party in gov.	0.700**	0.697*	0.366
	(0.247)	(0.281)	(0.230)
EU member	−0.650	−0.657	−0.387
	(0.406)	(0.414)	(0.382)
Timetrend	0.026		
	(0.026)		
Lagged dependent			0.720***
			(0.093)
Constant	−17.897***	−14.073**	−14.834***
	(3.712)	(4.984)	(2.451)
Year fixed effects	No	Yes	No
Standard errors clustered on Country	Yes	Yes	Yes
Offset specification	Independent years (log)	Independent years (log)	Independent years (log)
Observations	729	729	729
Log Likelihood	−582.755	−564.248	−429.729
θ	4.678* (2.177)	6.822+ (4.107)	14.142** (4.439)
Akaike Inf. Crit.	1,243.511	1,256.496	937.458

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table B.6: Union density decline in OECD from 1990-2018

Country	Peak year in sample	Peak union density	Last union density	Percentage change
Australia	1991	42.0	15.0	-64.29
Austria	1990	46.8	26.3	-43.8
Belgium	2001	56.4	50.3	-10.8
Canada	1993	35.7	29.4	-17.65
Chile	1991	17.8	17.7	-0.56
Colombia	1991	13.7	6.5	-52.55
Czechia	1993	67.3	11.5	-82.89
Denmark	1993	76.7	66.5	-13.30
Estonia	1992	93.9	4.3	-95.42
Finland	1993	81.2	60.3	-25.74
France	1990	10.7	8.8	-17.76
Germany	1991	36.0	16.5	-54.17
Greece	1992	37.6	20.2	-46.28
Hungary	1990	88.6	7.9	-91.08
Iceland	2002	92.5	91.6	-0.97
Ireland	1992	51.3	24.5	-52.24
Israel	1990	73.0	25.0	-65.75
Italy	1990	38.7	34.4	-11.11
Japan	1990	25.2	17.0	-32.53
Latvia	1995	29.0	11.9	-58.97
Lithuania	1995	33.2	7.1	-78.62
Luxembourg	1990	46.1	31.8	-31.02
Mexico	1992	24.3	13.8	-43.21
Netherlands	1995	25.5	16.4	-35.69
New Zealand	1990	49.7	17.3	-65.19
Norway	1990	58.5	49.2	-15.90
Poland	1990	49.3	12.7	-74.24
Portugal	1990	29.3	15.3	-47.78
Slovakia	1993	70.7	10.7	-84.86
Slovenia	1990	69.0	20.4	-70.44
South Korea	1990	17.2	10.5	-38.96
Spain	1993	19.8	13.6	-31.31
Sweden	1994	97.2	65.6	-32.51
Switzerland	1994	23.1	17.1	-25.97
Turkey	1994	20.5	9.2	-55.12
United Kingdom	1991	39.8	23.4	-41.21
United States	-	-	-	-

Adapted from Pontusson (2013, p. 800), based on data from ICTWSS (2019). USA is not included because they do not have any observations on general union density in the ICTWSS database within the time period of the sample.

Table B.7: Sector specific union density data in OECD countries from 1990-2018

Country	**Public sector**			**Private sector**			**Agriculture**			**Industry**			**Service**		
	First	*Last*	*% change*	*First*	*Last*	*% change*	*First*	*Last*	*% change*	*First*	*Last*	*% change*	*First*	*Last*	*% change*
Australia	66.8 1990	41.7 2013	-37.58	30.8 1990	10.3 2016	-66.56	12.4 1994	1.9 2010	-84.68	41.1 1994	14.1 2016	-65.69	33.7 1994	14.6 2016	-56.68
Austria	60.9 1998	48.0 2013	-21.18	30.8 1998	21.1 2017	-31.50	58.3 1990	11.8 2016	-79.76	53.9 1990	32.2 2016	-40.30	42.2 1990	26.5 2016	-37.20
Belgium	66.4 1990	56.0 2013	-15.66	51.6 1990	51.0 2016	-1.17	91.4 1990	51.6 2016	-43.55	96.7 1990	63.2 2016	-34.64	34.8 1990	47.1 2016	35.34
Canada	69.7 1997	72 2017	3.30	19 1997	14.9 2017	-22.10	3.9 1999	3.8 2017	-2.56	31.1 1999	25.7 2017	-17.36	39 1999	29.1 2017	-3.00
Chile	-	-	-	17.7 2009	20.3 2015	-16.26	-	-	-	-	-	-	-	-	-
Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czechia	21 2013	-	-	- 12 2013	-	-	2.4 2013	2.1 2016	-12.5	26.5 2013	10.8 2016	-59.25	14.7 2013	13.3 2016	-9.52
Denmark	82.8 1994	78 2013	-5.80	73.0 1994	59.9 2016	-17.94	46.6 1994	41.6 2016	-10.72	82.6 1994	75.8 2016	-8.23	76.9 1994	65.6 2016	-14.69
Estonia	16.0 2016	-	-	1.0 2016	-	-	-	-	-	-	-	-	-	-	-
Finland	85.0 1991	76.0 2013	-10.59	72.0 1991	55.2 2016	-23.33	64.5 1995	46.9 2016	-27.29	84.3 1995	66.3 2016	-21.35	79.5 1995	62.9 2016	-21.88
France	19.8 2013	-	-	8.7 2013	-	-	39.8 1993	4.8 2013	-87.94	14 1993	13 2016	-7.14	11.0 1993	11.0 2016	0.00
Germany	40.8 1998	26.7 2015	-34.56	21 1998	14.7 2015	-30.00	21.3 1990	6.5 2016	-69.48	43.5 1990	18.8 2016	-56.78	23.8 1990	15.3 2016	-35.71
Greece	51.3 1992	47.1 2012	-8.19	33.8 1992	15.0 2016	-55.6	37.0 2002	39.2 2008	3.43	24.9 2002	15.4 2008	-38.15	24.6 2002	24.9 2008	19.51
Hungary	18.0 2015	-	-	5.4 2015	-	-	5.9 2001	2.2 2015	-62.71	14.7 2001	4.3 2016	-70.74	24.3 2001	10.3 2015	-57.61
Iceland	94.0 2015	-	-	90.6 2015	-	-	86.8 2015	-	-	92.3 2015	-	-	96.2 2015	-	-
Ireland	56.3 2001	59.0 2013	4.79	30.3 2001	19.6 2017	-35.31	10.9 1994	7.0 2017	-35.77	50.0 1994	19.0 2017	-62.00	21.0 1994	26.0 2017	-38.09
Israel	51.0 2000	53.0 2012	3.92	41.2 2000	13.0 2012	-68.44	22.2 2000	-	13.3	- 2012	25.6	-	- 2012	-	-
Italy	50.0 2008	-	-	24.4 2008	26.0 2014	6.55	95.0 1990	87.9 2016	-7.47	43.8 1990	43.1 2016	-1.59	30.2 1990	29.6 2016	-1.99
Japan	47.2 1997	28.0 2015	-40.67	19.7 1997	16.3 2015	-17.26	2.2 2012	2.2 2016	0.00	25.7 2012	24.5 2016	-4.66	15.2 2012	14.9 2016	-1.97
Latvia	34.0 2008	32.0 2012	-5.88	8.5 2008	5.6 2012	-34.12	-	-	-	-	-	-	-	-	-
Lithuania	28 2013	-	-	6 2013	-	-	-	-	-	7.4 2002	2.9 2016	-60.81	9.2 2013	-	-
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mexico	40.0 2015	-	-	6.0 2015	-	-	-	-	-	21.0 1998	13.9 2015	-33.81	14.0 2015	-	-
Netherlands	26.4 1995	23.5 2013	-35.43	24.2 1995	15.2 2016	-37.19	24.9 8.6 1990	-65.46 2016	29.1	22.1 1990	-24.05 2016	22.7	16.3 1990	2016	-28.19
New Zealand	56.0 2014	-	-	10.0 2014	-	-	2.7 2001	3.7 2016	37.03	25.2 2001	14.1 2016	-44.04	21.2 2001	18.1 2016	-14.62
Norway	80.0 1995	80.0 2017	0.00	44.0 1995	38.0 2017	-13.63	19.0 1995	26.2 2013	37.89	53.3 1995	51.3 2013	-3.75	57.1 1995	52.9 2013	-7.35
Poland	22.0 2013	-	-	10.0 2013	-	-	34.0 2000	6.9 2014	-79.70	21.1 2000	10.3 2016	-51.18	18.6 2000	11.9 2014	-36.02
Portugal	59.0 2013	-	-	11.0 2013	-	-	64.1 2002	30.7 2015	-52.10	16.8 2002	10.1 2015	-39.88	21.2 2002	18.7 2015	-11.79
Slovakia	26.0 2012	-	-	10.0 2012	-	-	28.3 2003	18.7 2016	-33.92	29.5 2003	10.6 2016	-64.07	23.6 2003	10.0 2016	-99.57
Slovenia	74.0 1991	42.0 2015	-43.24	65.0 1991	13.0 2015	-80.0	-	-	-	52.5 2002	20.2 2016	-61.52	40.0 2002	22.0 2016	-45.00
South Korea	34.3 2006	16.5 2015	-51.89	7.8 2006	9.1 2015	16.66	5.0 2011	5.2 2016	4.00	11.1 2011	12.3 2016	10.81	10.9	12.1	11.00
Spain	31.2 1999	38.0 2013	21.79	15.0 1999	14.0 2013	-6.66	8.8 1991	2.0 2016	-77.27	18.2 1991	12.1 2016	-33.51	16.7 1991	15.4 2016	-7.78
Sweden	91.0 1990	79.0 2017	-13.18	75.0 1990	64.0 2017	-14.66	67.8 1990	33.7 2016	-50.29	95.3 1990	70.6 2016	-25.91	78.3 1990	66.9 2016	-14.55
Switzerland	43.0 1999	22.0 2013	-48.83	15.6 1999	15.0 2013	-3.84	2.6 2015	-	-	32.3 2005	25.3 2015	-21.67	15.6 2005	16.1 2015	3.20
Turkey	11.0 2013	11.0 2016	0.00	5.3 2013	6.8 2016	28.30	7.4 2013	6.2 2016	-16.21	8.9 2013	11.7 2016	31.46	5.6 2013	6.2 2016	10.71
United Kingdom	61.3 1995	52.5 2018	-14.35	21.4 1995	13.2 2018	-38.31	13.4 1990	8.5 2016	-36.56	41.1 1990	17.2 2016	-58.15	39.6 1990	24.9 2016	-37.12
United States	36.5 1990	33.9 2018	-7.12	11.9 1990	6.3 2018	-46.21	2.5 2000	2.2 2018	-12.0	15.5 2000	10.6 2018	-31.61	12.3 2000	10.6 2018	-13.82

Adapted from Pontusson (2013, p. 802), based on data from ICTWSS (2019).

Appendix C

Specifications

In this appendix, I present different specifications of the main models. First, I present the negative binomial models with different offset specifications in table C.1. Different standard error specifications can be seen in tables C.2, C.3 and C.4. For the main analysis, the standard errors clustered on country was chosen. Table C.5 to C.8 presents the results of variants of the main models with the individual components from the corporatism index. Figure C.1 to C.5 presents the significant interaction terms from these models in the same manner as done in the main analysis. Figure C.6 to C.8 presents different scenarios based on the main models. In table C.9 to C.12, I have tested different operationalizations of various independent variables. Table C.13 presents a different dependent variable, in order to test the relationship between Kyoto protocol ratification and union density. Table C.14 and C.15 present the main models without outliers, which makes the results of interest stronger. Tables C.16 to C.21 present the main models with different lag structures on the independent variables.

Offset specifications

Table C.1: Negative binomial, comparing with and without offset specification

	Dependent variable:					
	Yearly adopted climate policies					
		Offset: independent years		Offset: independent years		Offset: independent years
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	-0.036^{+}	-0.036^{+}	-0.027	-0.026	-0.065^{**}	-0.055^{*}
	(0.020)	(0.020)	(0.018)	(0.018)	(0.023)	(0.024)
Corporatism	0.642^{**}	0.637^{**}	0.736^{***}	0.742^{***}	0.064	0.087
	(0.239)	(0.238)	(0.203)	(0.200)	(0.174)	(0.171)
Logged GDP	1.030^{*}	0.967^{*}	1.053	1.026	0.462^{*}	0.239
	(0.478)	(0.475)	(0.661)	(0.669)	(0.226)	(0.241)
Democracy	1.356	1.813	-0.158	0.348	0.856	1.503
	(3.395)	(3.556)	(3.576)	(3.756)	(2.811)	(3.034)
Logged emissions per capita	0.044	0.038	0.013	0.011	-0.085^{+}	-0.073
	(0.068)	(0.067)	(0.080)	(0.081)	(0.049)	(0.055)
Industry	-0.061^{*}	-0.058^{+}	-0.045	-0.043	0.012	0.025
	(0.031)	(0.030)	(0.033)	(0.033)	(0.023)	(0.027)
Trade openness	0.017^{**}	0.016^{*}	0.019^{**}	0.019^{**}	0.006^{+}	0.004
	(0.006)	(0.006)	(0.006)	(0.006)	(0.003)	(0.004)
Green party in gov.	0.453	0.429	0.457	0.432	0.337	0.268
	(0.377)	(0.381)	(0.423)	(0.430)	(0.245)	(0.241)
EU member	0.164	-0.136	0.249	0.003	0.405	0.139
	(0.826)	(0.778)	(0.762)	(0.741)	(0.720)	(0.683)
Timetrend	0.025	0.005				
	(0.030)	(0.030)				
Lagged dependent					0.686^{***}	0.683^{***}
					(0.105)	(0.105)
Constant	-11.442^{*}	-14.223^{**}	-9.898	-13.613^{+}	-7.359^{**}	-9.703^{***}
	(4.560)	(4.614)	(7.330)	(7.462)	(2.531)	(2.799)
Year fixed effects	No	No	Yes	Yes	No	No
Standard errors clustered on Country	Yes	Yes	Yes	Yes	Yes	Yes
Observations	664	643	664	643	664	643
Log Likelihood	-519.883	-513.407	-497.323	-491.090	-386.432	-382.445
θ	6.053^{+} (3.559)	6.143^{+} (3.665)	12.815 (13.355)	13.092 (13.947)	21.759^{*} (9.945)	19.949^{*} (8.565)
Akaike Inf. Crit.	1,123.767	1,108.814	1,128.647	1,114.180	856.863	846.889

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Standard error specifications

Table C.2: Different standard error specification: timetrend variable

	Dependent variable:			
	Yearly adopted climate policies			
	Country cluster	Year cluster	HAC	Normal
	(1)	(2)	(3)	(4)
Union density	-0.036^{+}	-0.036	-0.036	-0.036
	(0.020)	(0.027)	(0.026)	(0.027)
Corporatism	0.621	0.621	0.621	0.621
	(0.536)	(0.907)	(0.876)	(0.836)
Logged GDP	-0.058^{+}	-0.058	-0.058	-0.058^{+}
	(0.030)	(0.040)	(0.038)	(0.034)
Democracy	0.967^{*}	0.967^{**}	0.967^{*}	0.967^{*}
	(0.478)	(0.336)	(0.449)	(0.381)
Logged emissions per capita	1.826	1.826	1.826	1.826
	(3.436)	(3.116)	(3.989)	(3.168)
Industry	0.038	0.038	0.038	0.038
	(0.068)	(0.178)	(0.301)	(0.135)
Trade openness	0.016^{*}	0.016^{*}	0.016^{*}	0.016^{*}
	(0.006)	(0.006)	(0.008)	(0.007)
Green party in gov.	0.429	0.429	0.429	0.429
	(0.386)	(0.391)	(0.400)	(0.349)
EU member	-0.135	-0.135	-0.135	-0.135
	(0.758)	(0.755)	(0.800)	(0.774)
Timetrend	0.005	0.005	0.005	0.005
	(0.030)	(0.023)	(0.031)	(0.025)
UD:CorpAll	0.0005	0.0005	0.0005	0.0005
	(0.015)	(0.026)	(0.026)	(0.022)
Constant	-14.244^{**}	-14.244^{***}	-14.244^{*}	-14.244^{***}
	(4.699)	(3.546)	(5.642)	(4.257)
Observations	643	643	643	643
Log Likelihood	-513.407	-513.407	-513.407	-513.407
θ	6.139^{+} (3.661)	6.139^{+} (3.661)	6.139^{+} (3.661)	6.139^{+} (3.661)
Akaike Inf. Crit.	1,110.814	1,110.814	1,110.814	1,110.814

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table C.3: Different standard error specification: FE

	Dependent variable:			
	Yearly adopted climate policies			
	Country cluster	Year cluster	HAC	Normal
	(1)	(2)	(3)	(4)
Union density	−0.027	−0.027	−0.027	−0.027
	(0.019)	(0.026)	(0.031)	(0.029)
Corporatism	0.568	0.568	0.568	0.568
	(0.573)	(0.877)	(0.964)	(0.849)
Logged GDP	−0.043	−0.043	−0.043	−0.043
	(0.032)	(0.043)	(0.043)	(0.036)
Democracy	1.030	1.030	1.030	1.030^{+}
	(0.673)	(0.661)	(0.791)	(0.619)
Logged emissions per capita	0.470	0.470	0.470	0.470
	(3.707)	(3.866)	(4.770)	(3.317)
Industry	0.008	0.008	0.008	0.008
	(0.083)	(0.182)	(0.311)	(0.138)
Trade openness	0.019^{**}	0.019^{**}	0.019^{*}	0.019^{*}
	(0.006)	(0.007)	(0.009)	(0.007)
Green party in gov.	0.425	0.425	0.425	0.425
	(0.432)	(0.431)	(0.458)	(0.364)
EU member	0.035	0.035	0.035	0.035
	(0.726)	(0.739)	(0.844)	(0.790)
UD:CorpAll	0.005	0.005	0.005	0.005
	(0.015)	(0.023)	(0.027)	(0.023)
Constant	-13.809^{+}	-13.809^{+}	−13.809	-13.809^{*}
	(7.607)	(7.089)	(9.279)	(6.498)
Observations	643	643	643	643
Log Likelihood	−491.062	−491.062	−491.062	−491.062
θ	12.836 (13.439)	12.836 (13.439)	12.836 (13.439)	12.836 (13.439)
Akaike Inf. Crit.	1,116.125	1,116.125	1,116.125	1,116.125
Note:	+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001			

Table C.4: Different standard error specification: AR(1)

	Dependent variable:			
	Yearly adopted climate policies			
	Country cluster	Year cluster	HAC	Normal
	(1)	(2)	(3)	(4)
Union density	-0.058^{**}	-0.058^{*}	-0.058^{+}	-0.058^{*}
	(0.022)	(0.024)	(0.029)	(0.028)
Corporatism	-0.649	-0.649	-0.649	-0.649
	(0.427)	(0.428)	(0.670)	(0.853)
Logged GDP	0.026	0.026	0.026	0.026
	(0.026)	(0.020)	(0.026)	(0.029)
Democracy	0.250	0.250	0.250	0.250
	(0.232)	(0.268)	(0.298)	(0.324)
Logged emissions per capita	2.113	2.113	2.113	2.113
	(2.790)	(1.938)	(3.169)	(3.215)
Industry	-0.079	-0.079	-0.079	-0.079
	(0.056)	(0.072)	(0.229)	(0.117)
Trade openness	0.003	0.003	0.003	0.003
	(0.004)	(0.003)	(0.005)	(0.006)
Green party in gov.	0.254	0.254	0.254	0.254
	(0.245)	(0.209)	(0.255)	(0.320)
EU member	0.216	0.216	0.216	0.216
	(0.675)	(0.680)	(0.752)	(0.771)
Lagged dependent	0.698^{***}	0.698^{***}	0.698^{***}	0.698^{***}
	(0.104)	(0.050)	(0.139)	(0.042)
UD:CorpAll	0.022^{+}	0.022^{+}	0.022	0.022
	(0.012)	(0.014)	(0.019)	(0.023)
Constant	-10.520^{***}	-10.520^{***}	-10.520^{**}	-10.520^{*}
	(2.690)	(2.882)	(3.962)	(4.402)
Observations	643	643	643	643
Log Likelihood	-381.915	-381.915	-381.915	-381.915
θ	17.003^{**} (6.478)	17.003^{**} (6.478)	17.003^{**} (6.478)	17.003^{**} (6.478)
Akaike Inf. Crit.	847.829	847.829	847.829	847.829

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Corporatism components

Table C.5: Negative binomial models: different corporatism components 1

	Dependent variable:					
	Yearly adopted climate policies					
	Timetrend	FE	AR(1)	Timetrend	FE	AR(1)
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	-0.090^{*}	-0.081^{*}	-0.128^{*}	-0.061^{*}	-0.058^{*}	-0.080^{*}
	(0.044)	(0.040)	(0.055)	(0.030)	(0.030)	(0.031)
Centralization of bargaining	-3.666^{**}	-4.523^{***}	-3.993^{*}			
	(1.285)	(1.253)	(1.624)			
Work council strucutre				-0.414	-0.445	-0.034
				(0.479)	(0.455)	(0.280)
GDP (log)	-0.065^{+}	-0.048	0.006	-0.059^{+}	-0.043	0.026
	(0.038)	(0.045)	(0.013)	(0.033)	(0.036)	(0.025)
Democracy	0.363	0.269	0.169	0.896^{+}	0.877	0.068
	(0.498)	(0.744)	(0.305)	(0.486)	(0.618)	(0.224)
Emissions per capita (log)	6.548	4.638	9.653	5.272	3.436	3.704
	(6.255)	(6.537)	(6.073)	(3.831)	(3.984)	(2.965)
Industry	1.539^{*}	1.758^{*}	1.313^{**}	0.019	-0.012	-0.091
	(0.652)	(0.849)	(0.451)	(0.065)	(0.079)	(0.056)
Trade openess	0.011	0.010	0.006^{+}	0.016^{*}	0.018^{**}	0.004
	(0.008)	(0.008)	(0.004)	(0.006)	(0.006)	(0.004)
Green party in gov.	0.393	0.419	0.377^{+}	0.445	0.433	0.246
	(0.381)	(0.449)	(0.224)	(0.384)	(0.421)	(0.249)
EU member	-0.263	-0.033	-0.098	0.110	0.240	0.323
	(0.675)	(0.675)	(0.541)	(0.757)	(0.712)	(0.673)
Timetrend	0.044			0.002		
	(0.036)			(0.032)		
Lagged dependent			0.663^{***}			0.698^{***}
			(0.109)			(0.100)
Interaction: union density and centralization	0.111^{**}	0.119^{**}	0.121^{*}			
	(0.042)	(0.038)	(0.053)			
Interaction: union density and work council structure				0.011	0.013	0.011
				(0.008)	(0.008)	(0.009)
Constant	3.308	9.811	0.392	-16.361^{**}	-14.640^{*}	-9.577^{***}
	(9.610)	(12.437)	(6.208)	(5.075)	(7.329)	(2.857)
Observations	502	502	502	621	621	621
Log Likelihood	-406.241	-382.034	-304.598	-495.048	-473.461	-366.099
θ	6.688 (4.696)	26.633 (56.490)	23.470^{+} (13.207)	4.623^{*} (2.297)	8.160 (6.034)	15.636^{**} (5.791)
Akaike Inf. Crit.	882.483	884.069	679.196	1,070.097	1,076.923	812.198

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table C.6: Negative binomial models: different corporatism components 2

	Dependent variable:					
	Yearly adopted climate policies					
	Timetrend	FE	AR(1)	Timetrend	FE	AR(1)
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	−0.023	−0.024	−0.067^{+}	−0.019	−0.021	−0.052*
	(0.035)	(0.034)	(0.035)	(0.023)	(0.022)	(0.025)
Work council rights	0.474	0.618	−0.053			
	(1.082)	(1.110)	(0.601)			
Government intervention				0.145	−0.029	0.254
				(0.233)	(0.236)	(0.207)
GDP (log)	−0.057	−0.041	0.023	−0.056	−0.045	0.036
	(0.034)	(0.036)	(0.025)	(0.038)	(0.039)	(0.030)
Democracy	0.918^{+}	0.925	0.104	0.979^{+}	1.017	0.224
	(0.484)	(0.633)	(0.224)	(0.501)	(0.658)	(0.238)
Emissions per capita (log)	4.199	2.125	3.696	2.236	0.768	1.722
	(3.997)	(3.507)	(3.521)	(3.807)	(4.032)	(3.070)
Industry	0.033	0.002	−0.085	0.049	0.017	−0.090^{+}
	(0.065)	(0.079)	(0.053)	(0.074)	(0.086)	(0.051)
Trade openess	0.015*	0.017**	0.004	0.015*	0.017**	0.006^{+}
	(0.006)	(0.006)	(0.004)	(0.006)	(0.006)	(0.003)
Green party in gov.	0.544	0.506	0.249	0.494	0.506	0.266
	(0.370)	(0.391)	(0.254)	(0.363)	(0.400)	(0.246)
EU member	0.019	0.133	0.304	−0.101	0.042	0.112
	(0.778)	(0.712)	(0.658)	(0.767)	(0.726)	(0.685)
Timetrend	0.002			0.004		
	(0.033)			(0.033)		
Lagged dependent			0.689***			0.682***
			(0.101)			(0.104)
Interaction: union density and work council rights	−0.003	−0.001	0.008			
	(0.012)	(0.013)	(0.009)			
Interaction: union density and government intervention				−0.004	0.00003	−0.003
				(0.004)	(0.004)	(0.004)
Constant	−16.323**	−14.494*	−10.055***	−15.362**	−14.118^{+}	−10.764***
	(5.011)	(7.193)	(2.856)	(4.887)	(7.436)	(2.816)
Observations	621	621	621	638	638	638
Log Likelihood	−495.203	−473.484	−366.572	−509.561	−488.385	−378.426
θ	4.787* (2.439)	8.488 (6.460)	17.222* (6.841)	5.571^{+} (3.098)	10.159 (8.774)	21.653* (10.030)
Akaike Inf. Crit.	1,070.406	1,076.969	813.143	1,101.123	1,108.771	838.852

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table C.7: Negative binomial models: different corporatism components 3

	Dependent variable:					
	Yearly adopted climate policies					
	Timetrend	FE	AR(1)	Timetrend	FE	AR(1)
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	−0.047	−0.038	−0.089**	−0.032	−0.032	−0.062
	(0.032)	(0.028)	(0.028)	(0.034)	(0.032)	(0.038)
Level of wage bargaining	0.032	−0.004	−0.356*			
	(0.344)	(0.267)	(0.165)			
Involvement of labor organizations				0.132	0.132	−0.086
				(0.547)	(0.502)	(0.485)
GDP (log)	−0.054+	−0.042	0.029	−0.042	−0.042	0.014
	(0.030)	(0.033)	(0.027)	(0.033)	(0.036)	(0.020)
Democracy	1.018*	1.110+	0.287	0.833+	0.833	0.252
	(0.465)	(0.646)	(0.230)	(0.455)	(0.728)	(0.237)
Emissions per capita (log)	2.360	0.880	2.178	3.216	3.216	3.347
	(3.734)	(3.941)	(2.976)	(3.539)	(3.681)	(2.893)
Industry	0.036	0.013	−0.080	1.554*	1.554+	1.208**
	(0.063)	(0.079)	(0.050)	(0.609)	(0.804)	(0.424)
Trade openess	0.016*	0.018**	0.002	0.016**	0.016***	0.009**
	(0.006)	(0.006)	(0.004)	(0.005)	(0.004)	(0.003)
Green party in gov.	0.473	0.471	0.277	0.446	0.446	0.234
	(0.370)	(0.416)	(0.239)	(0.331)	(0.384)	(0.211)
EU member	−0.094	0.073	0.350	−0.094	−0.094	−0.060
	(0.697)	(0.662)	(0.606)	(0.871)	(0.756)	(0.714)
Timetrend	0.006					
	(0.029)					
Lagged dependent			0.692***			0.722***
			(0.104)			(0.108)
Interaction: union density and level of wage bargaining	0.004	0.005	0.012*			
	(0.009)	(0.008)	(0.005)			
Interaction: union density and involvement of labor organizations				0.006	0.006	0.010
				(0.020)	(0.018)	(0.019)
Constant	−15.760***	−15.289*	−10.111***	1.551	1.551	2.076
	(4.718)	(7.295)	(2.670)	(7.395)	(11.149)	(4.679)
Observations	643	643	643	607	607	607
Log Likelihood	−513.347	−491.418	−381.356	−452.202	−452.202	−352.459
θ	5.930+ (3.444)	11.699 (11.277)	18.298* (7.365)	19.159 (29.295)	19.159 (29.295)	15.214** (5.536)
Akaike Inf. Crit.	1,110.695	1,116.836	846.711	1,036.405	1,036.405	786.917

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Country fixed effects on all models

Table C.8: Negative binomial models: different corporatism components 4

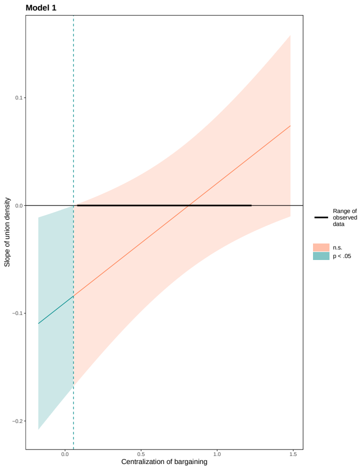
	Dependent variable:								
	Yearly adopted climate policies								
	Timetrend	FE	AR(1)	Timetrend	FE	AR(1)	Timetrend	FE	AR(1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Union density	−0.051	−0.041	−0.109***	−0.002	0.005	−0.024	−0.069*	−0.063^{+}	−0.090**
	(0.031)	(0.032)	(0.032)	(0.026)	(0.025)	(0.023)	(0.034)	(0.033)	(0.033)
Wage bargaining coordination	−0.137	−0.089	−0.638**						
	(0.294)	(0.291)	(0.214)						
Extention of bargaining				0.825**	0.730*	0.561			
				(0.290)	(0.326)	(0.355)			
Sectoral organization							−1.874***	−1.357*	−1.499**
							(0.494)	(0.571)	(0.527)
GDP (log)	−0.055^{+}	−0.041	0.030	−0.048	−0.031	0.047^{+}	−0.059^{+}	−0.046	0.022
	(0.031)	(0.034)	(0.026)	(0.031)	(0.037)	(0.029)	(0.033)	(0.036)	(0.026)
Democracy	1.016*	1.076	0.313	0.934^{+}	0.907	0.406^{+}	0.864^{+}	0.861	0.081
	(0.484)	(0.659)	(0.231)	(0.477)	(0.676)	(0.244)	(0.493)	(0.657)	(0.213)
Emissions per capita (log)	2.294	0.845	2.262	2.183	0.487	2.214	6.297^{+}	4.166	4.643
	(3.672)	(3.906)	(2.826)	(3.572)	(3.777)	(3.223)	(3.824)	(4.224)	(2.963)
Industry	0.042	0.013	−0.079	0.059	0.027	−0.068	0.018	−0.014	−0.089
	(0.068)	(0.084)	(0.053)	(0.064)	(0.077)	(0.049)	(0.065)	(0.083)	(0.054)
Trade openess	0.014*	0.017**	0.003	0.012^{+}	0.014*	−0.0001	0.015*	0.017**	0.003
	(0.006)	(0.006)	(0.004)	(0.006)	(0.006)	(0.004)	(0.006)	(0.006)	(0.004)
Green party in gov.	0.455	0.461	0.270	0.362	0.354	0.251	0.549	0.507	0.299
	(0.365)	(0.411)	(0.220)	(0.390)	(0.425)	(0.250)	(0.376)	(0.406)	(0.256)
EU member	−0.123	0.052	0.280	−0.220	−0.128	−0.036	0.054	0.184	0.282
	(0.731)	(0.684)	(0.543)	(0.742)	(0.683)	(0.648)	(0.746)	(0.712)	(0.669)
Timetrend	0.006			0.014			0.003		
	(0.030)			(0.031)			(0.032)		
Lagged dependent			0.703***			0.648***			0.695***
			(0.103)			(0.113)			(0.100)
Interaction: union density and wage bargaining coordination	0.007	0.006	0.020**						
	(0.009)	(0.008)	(0.006)						
Interaction: union density and extention of bargaining				−0.028*	−0.026*	−0.033*			
				(0.013)	(0.012)	(0.014)			
Interaction: union density and sectoral organization							0.027*	0.027*	0.025^{+}
							(0.014)	(0.012)	(0.015)
Constant	−15.166**	−14.634*	−9.856***	−15.880***	−14.036^{+}	−12.986***	−15.478**	−14.153^{+}	−9.214**
	(4.777)	(7.444)	(2.563)	(4.617)	(7.372)	(2.944)	(5.189)	(7.839)	(2.812)
Observations	643	643	643	643	643	643	621	621	621
Log Likelihood	−514.083	−492.002	−380.132	−512.364	−490.994	−380.237	−494.453	−473.231	−366.061
θ	5.544^{+} (3.059)	10.390 (9.070)	17.526* (6.835)	6.331^{+} (3.848)	13.058 (13.837)	98.208 (170.234)	4.636* (2.305)	8.141 (6.004)	15.565** (5.741)
Akaike Inf. Crit.	1,112.166	1,118.003	844.264	1,108.727	1,115.988	844.474	1,068.905	1,076.461	812.122

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

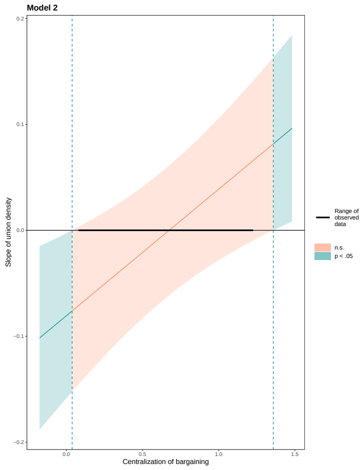
Country fixed effects on all models

Interaction plots of corporatism components

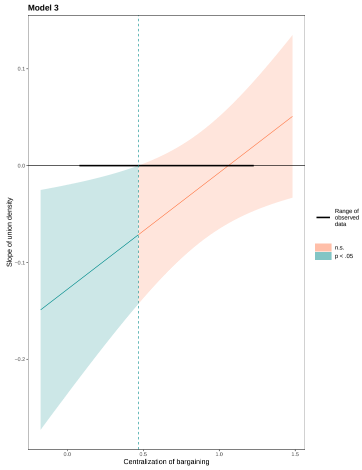
Figure C.1: Interaction plots: centralization of bargaining



Model 1



Model 2



Model 3

Figure C.2: Interaction plot: level of wage bargaining

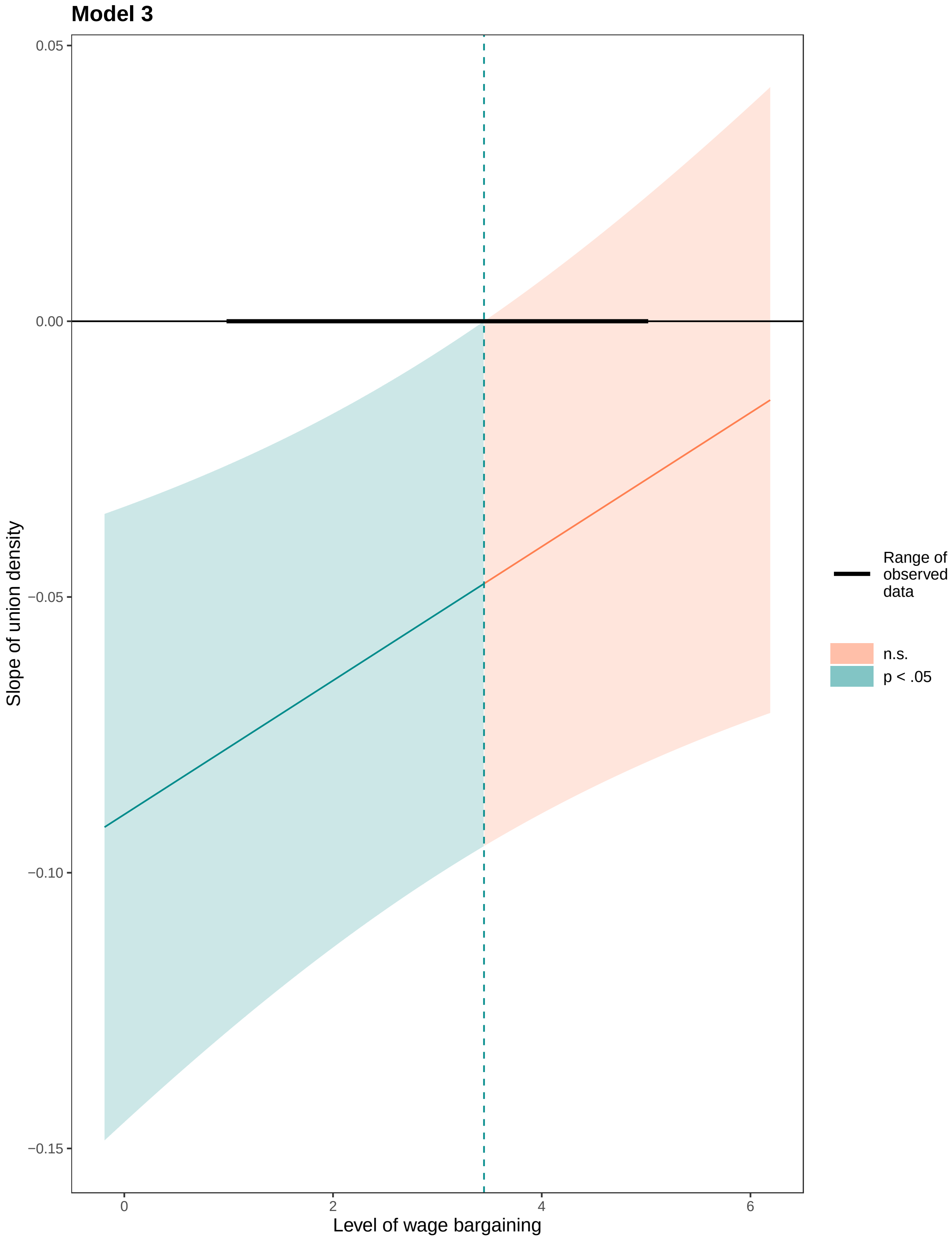


Figure C.3: Interaction plot: wage bargaining coordination

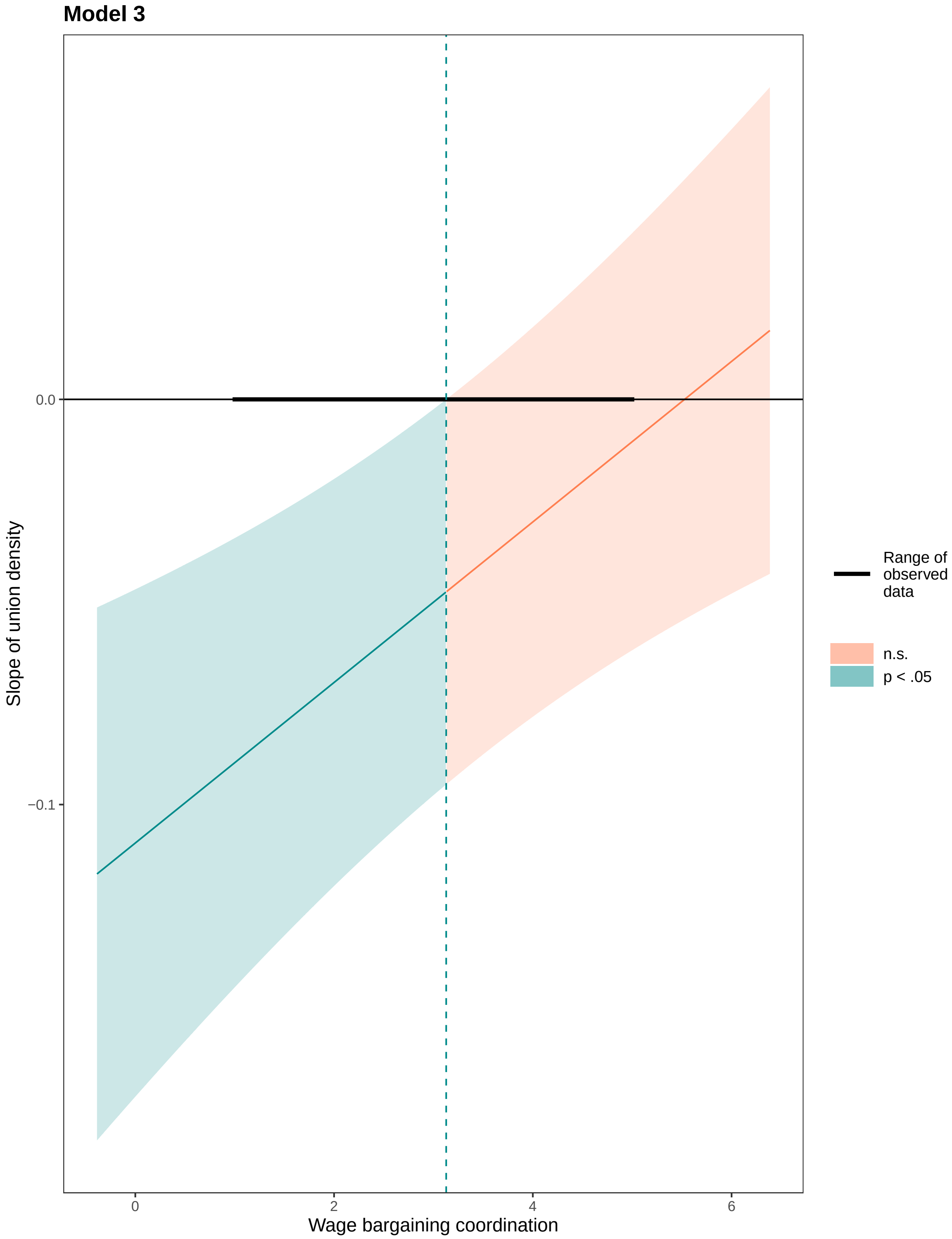
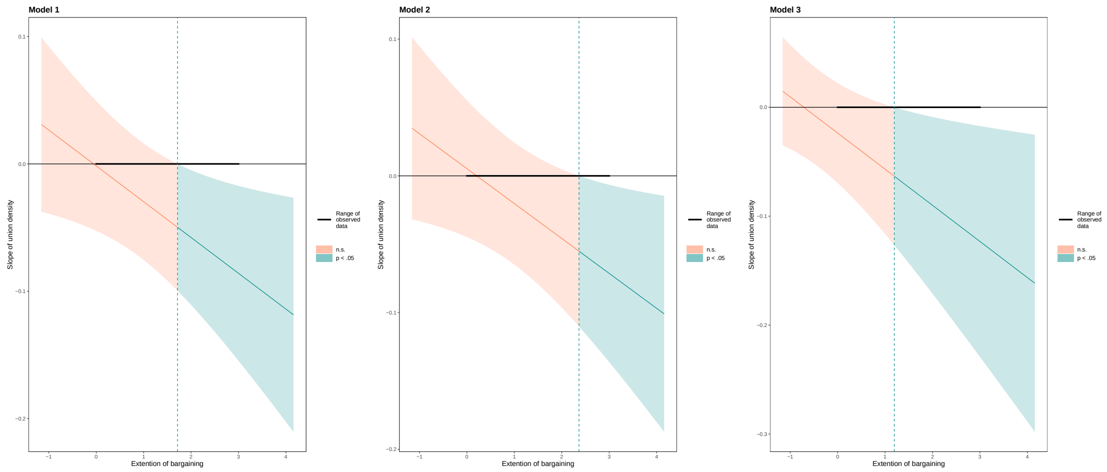
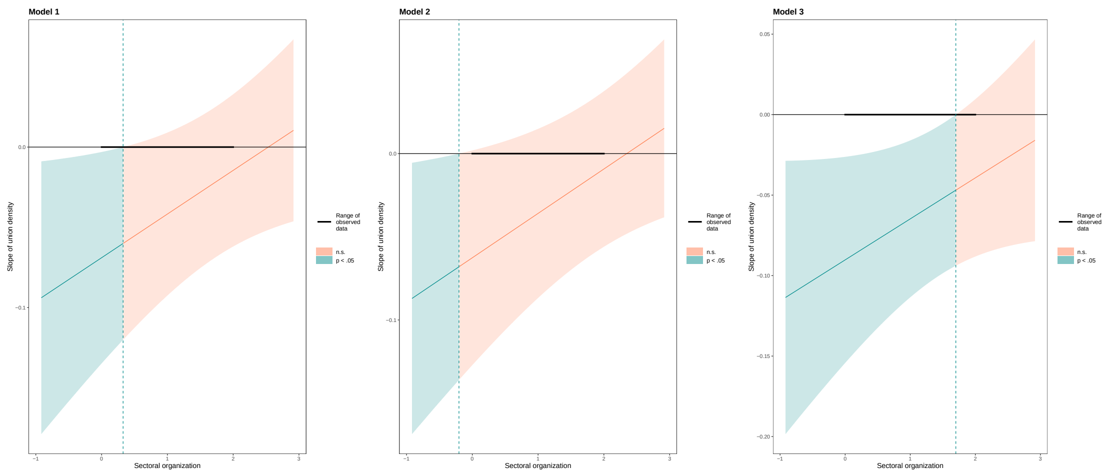


Figure C.4: Interaction plot: extension of wage bargaining



Model 1 Model 2 Model 3

Figure C.5: Interaction plot: sectoral organization



Model 1 Model 2 Model 3

Different scenarios based on main models

Figure C.6: Alternative scenarios from model 1

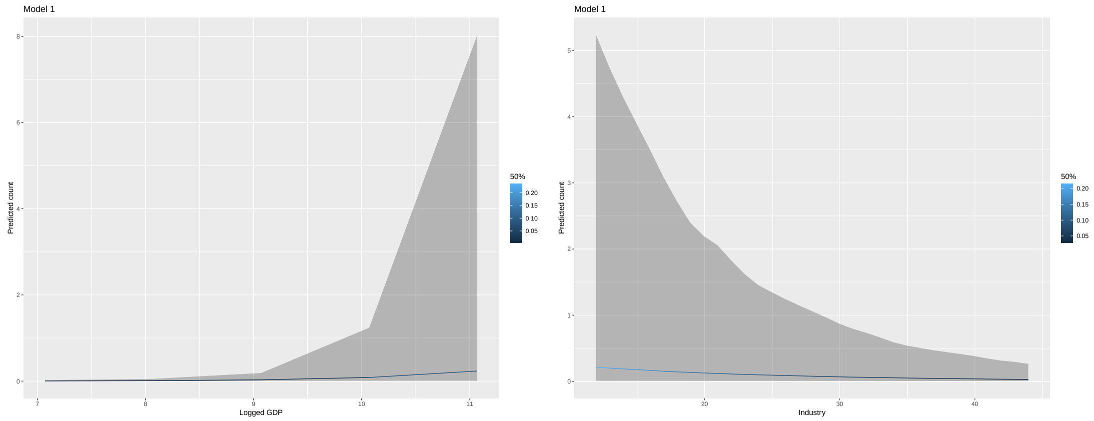


Figure C.7: Alternative scenarios from model 1

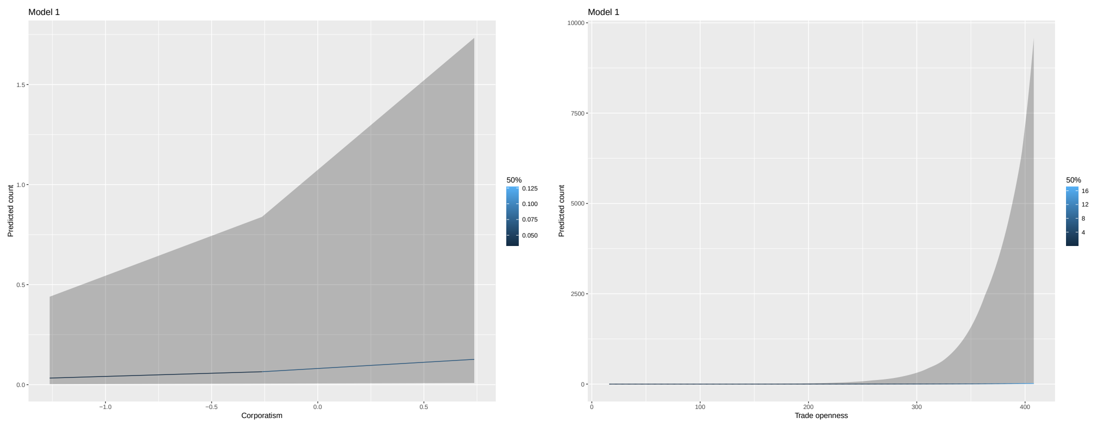
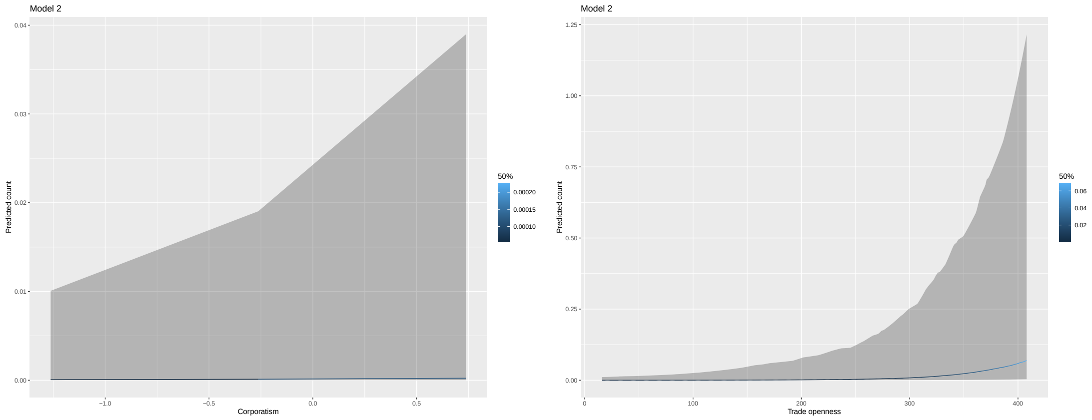


Figure C.8: Alternative scenarios from model 2



Other control variables

Table C.9: Exploring the limited data on employers organizations

	Dependent variable:			
	Yearly adopted climate policies			
	Timetred	FE	AR(1)	AR(1): Interaction
	(1)	(2)	(3)	(4)
Employers organization density	0.078*	0.210**	0.059+	0.472
	(0.034)	(0.073)	(0.031)	(1.258)
Corporatism	2.914+	0.955	0.452	87.273
	(1.571)	(3.030)	(2.001)	(138.402)
Logged GDP	1.297	−11.224**	0.524	0.456
	(1.158)	(4.013)	(0.603)	(0.603)
Democracy	−7.760	−36.029	58.653	61.009+
	(19.982)	(28.656)	(45.276)	(32.748)
Logged emissions per capita	1.183	3.183+	3.308	1.068
	(1.521)	(1.897)	(2.298)	(0.893)
Industry	−0.128	0.114	0.070	2.251
	(0.131)	(0.165)	(0.055)	(3.711)
Trade openness	0.041	0.006	0.005	−0.004
	(0.030)	(0.037)	(0.023)	(0.025)
Green party in gov.	0.219	−0.749	0.179	0.182
	(0.309)	(0.745)	(0.263)	(0.230)
EU member	−1.304+	1.319	−1.365**	−1.763**
	(0.688)	(5.828)	(0.480)	(0.682)
Timetrend	−0.053			
	(0.084)			
Lagged dependent			0.853*	1.031***
			(0.382)	(0.194)
Interaction: employers and corporatism				−0.644
				(1.563)
Interaction: employers and industry				−0.015
				(0.043)
Interaction: corporatism and industry				−2.925
				(4.555)
Interaction: employers, corporatism and industry				0.021
				(0.051)
Constant	−5.464	128.618*	−31.729	−116.679
	(24.227)	(61.629)	(37.174)	(107.298)
Standard errors clustered on Country	Yes	Yes	Yes	Yes
Observations	129	129	129	129
Log Likelihood	−80.042	−60.689	−61.623	−58.653
θ	7,213.470 (127,371.600)	21,948.480 (294,277.400)	13,832.550 (139,162.100)	16,044.980 (171,334.200)
Akaike Inf. Crit.	226.084	237.378	189.246	191.306

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table C.10: Countries and years included in model with employer's organizations

Austria (1990-2016)	Belgium (1997, 2002, 2004, 2009, 2014)	Czechia (2002, 2007, 2009, 2011-2014)	Denmark (1997, 2002, 2007-2008, 2011-2013)	Finland (1997, 2000, 2003, 2006, 2008, 2012, 2014)
France (1997, 2002, 2008, 2012)	Germany (1997, 2002, 2008, 2011, 2014)	Greece (2008)	Hungary (2004)	Ireland (2008)
Israel (2005)	Italy (1995, 1997, 2002, 2008, 2012)	Latvia (2002)	Luxembourg (2002, 2008, 2014)	Netherlands (1999, 2002, 2008, 2013)
Norway (2000-2001, 2004-2016)	Poland (2008)	Portugal (2002, 2008)	Slovenia (1995-2005, 2008, 2011, 2013)	Spain (2002, 2008, 2013)
Sweden (1995, 2000, 2005-2016)	Switzerland (1995)	United Kingdom (2016)		
SUM:				**23 countries**

Table C.11: Civil society participation

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Civil society participation	3.173	3.552	2.349
	(3.147)	(2.976)	(1.872)
Industry	−0.045	−0.024	0.003
	(0.031)	(0.029)	(0.022)
Logged GDP	1.043^{*}	0.727	0.962^{***}
	(0.434)	(0.498)	(0.202)
Democracy	0.895	−0.266	−1.132
	(3.327)	(3.347)	(1.945)
Logged emissions per capita	0.100	0.034	−0.032
	(0.096)	(0.100)	(0.062)
Trade openness	0.012^{*}	0.013^{**}	0.007^{*}
	(0.005)	(0.005)	(0.003)
Green party in gov.	0.753^{**}	0.749^{**}	0.450^{+}
	(0.240)	(0.264)	(0.235)
EU member	−0.311	−0.337	−0.063
	(0.441)	(0.413)	(0.414)
Timetrend	0.045^{+}		
	(0.027)		
Lagged dependent			0.724^{***}
			(0.094)
Constant	-15.902^{***}	-11.288^{*}	-13.800^{***}
	(3.700)	(4.858)	(2.147)
Standard errors clustered on country	Yes	Yes	Yes
Observations	751	751	751
Log Likelihood	−588.231	−569.067	−434.320
θ	4.746^{*} (2.230)	7.148 (4.473)	14.764^{**} (4.763)
Akaike Inf. Crit.	1,258.462	1,270.133	950.640
Note:	+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001		
	Country fixed effects on all models		

Table C.12: Different covariates

	Dependent variable:								
	Yearly adopted climate policies								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Union density	−0.034	−0.048^{+}	−0.048*	−0.027	−0.032	−0.041	−0.066*	−0.064*	−0.073**
	(0.022)	(0.025)	(0.024)	(0.024)	(0.025)	(0.026)	(0.029)	(0.026)	(0.024)
Corporatism	0.904	0.929	0.945	0.752	0.917	0.748	−0.516	−0.485	−0.688
	(0.875)	(0.900)	(0.903)	(0.945)	(0.948)	(0.931)	(0.675)	(0.667)	(0.659)
Fossil fuel producer	0.350			0.158			0.134		
	(0.236)			(0.370)			(0.231)		
Fossil fuel exporter		0.542**	0.546**		0.385	0.462^{+}		−0.086	−0.105
		(0.185)	(0.186)		(0.282)	(0.280)		(0.243)	(0.244)
GDP per capita (log)	0.568	0.402	0.368	0.659	0.685	0.533	0.411	0.505^{+}	0.538^{+}
	(0.399)	(0.418)	(0.432)	(0.629)	(0.610)	(0.618)	(0.398)	(0.279)	(0.285)
Democracy	0.428	0.651	0.902	−1.062	−0.782	−0.163	0.365	1.254	1.601
	(3.879)	(3.471)	(3.666)	(4.200)	(4.094)	(4.074)	(3.167)	(3.087)	(3.204)
Green party in gov.			0.219			0.125			0.252
			(0.330)			(0.360)			(0.226)
Emissions per capita (log)	−0.001	0.043	0.038	−0.031	−0.010	0.027	−0.083	−0.071	−0.061
	(0.293)	(0.303)	(0.303)	(0.285)	(0.311)	(0.327)	(0.273)	(0.279)	(0.252)
Trade openness	0.014*			0.017*	0.016*		0.008^{+}	0.007	
	(0.007)			(0.007)	(0.008)		(0.005)	(0.004)	
Green party vote	0.035	−0.016		−0.023	0.010		0.197	0.195	
	(0.259)	(0.247)		(0.280)	(0.274)		(0.179)	(0.172)	
EU member	0.185	0.414	0.408	0.142	0.131	0.385	0.414	0.433	0.510
	(0.824)	(0.854)	(0.859)	(0.842)	(0.854)	(0.857)	(0.760)	(0.740)	(0.747)
Timetrend	0.074**	0.094***	0.093***						
	(0.023)	(0.023)	(0.023)						
Lagged independent							0.727***	0.702***	0.702***
							(0.143)	(0.150)	(0.154)
Interaction: union density and corporatism	−0.007	−0.010	−0.011	−0.001	−0.002	−0.005	0.016	0.015	0.015
	(0.025)	(0.025)	(0.025)	(0.026)	(0.026)	(0.026)	(0.017)	(0.017)	(0.017)
Constant	−10.138^{+}	−8.297	−8.289	−7.687	−7.917	−6.079	−15.433	−7.809*	−7.963*
	(5.553)	(5.512)	(5.701)	(8.360)	(8.075)	(8.058)	(38.824)	(3.547)	(3.572)
Standard errors clustered on country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	712	717	717	712	712	717	712	712	717
Log Likelihood	−538.571	−537.829	−537.573	−516.388	−515.086	−518.150	−400.135	−400.384	−401.107
θ	6.159^{+} (3.599)	6.523 (3.996)	6.531 (4.000)	12.918 (13.297)	13.696 (14.793)	11.240 (10.308)	14.394** (4.764)	21.301* (9.532)	23.915* (11.769)
Akaike Inf. Crit.	1,163.142	1,159.657	1,159.146	1,168.776	1,166.172	1,170.299	888.269	886.767	886.215

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Other dependent variable

Table C.13: Membership in international environmental agreement

	Dependent variable:		
	Kyoto protocol membership		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.008*	−0.001	−0.013**
	(0.005)	(0.001)	(0.006)
Corporatism	0.120	−0.008	0.147
	(0.217)	(0.079)	(0.227)
GDP (log)	0.592***	0.014	0.760***
	(0.104)	(0.043)	(0.096)
Democracy	2.367**	−1.162*	2.301*
	(1.103)	(0.697)	(1.195)
Emissions per capita (log)	0.094**	−0.005	0.076*
	(0.038)	(0.006)	(0.040)
Industry	−0.004	0.002	−0.018
	(0.012)	(0.003)	(0.012)
Trade openess	−0.001	−0.0001	0.0002
	(0.001)	(0.0004)	(0.002)
Green party in gov.	0.116	−0.008	0.149
	(0.111)	(0.030)	(0.117)
EU member	−0.042	0.018	−0.079
	(0.128)	(0.030)	(0.153)
Timetrend	0.019***		
	(0.005)		
Lagged dependent			0.012
			(0.011)
Interaction: union density and corporatism	−0.004	0.001	−0.005
	(0.005)	(0.001)	(0.006)
Constant	−6.961***	0.698	−7.595***
	(1.206)	(0.909)	(1.358)
Observations	664	664	664
Log Likelihood	−1,012.311	−926.950	−1,014.407
θ	193,485.500 (1,274,170.000)	1,608,072.000 (26,481,621.000)	177,262.500 (1,114,740.000)
Akaike Inf. Crit.	2,110.622	1,989.899	2,114.814
Note:			*p<0.1; **p<0.05; ***p<0.01
			Country fixed effects on all models

Without outliers

Table C.14: Main models with interaction effects: without outliers

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	-0.042^{*}	-0.035^{+}	-0.014
	(0.017)	(0.018)	(0.019)
Corporatism	0.399	0.500^{*}	0.151
	(0.277)	(0.222)	(0.302)
GDP (log)	-0.033^{+}	-0.026	0.014
	(0.020)	(0.025)	(0.022)
Democracy	0.704^{+}	0.918	0.122
	(0.377)	(0.559)	(0.216)
Emissions per capita (log)	2.067	1.349	-2.321
	(3.552)	(3.667)	(1.829)
Industry	0.210	0.173	0.340
	(0.240)	(0.256)	(0.259)
Trade openess	0.013^{*}	0.014^{**}	0.003
	(0.006)	(0.005)	(0.005)
Green party in gov.	0.430	0.465	-0.019
	(0.344)	(0.401)	(0.284)
EU member	-0.060	0.115	0.076
	(0.786)	(0.742)	(0.590)
Timetrend	0.017		
	(0.023)		
Lagged dependent			1.261^{***}
			(0.079)
Constant	-10.887^{*}	-11.850^{+}	-2.208
	(4.614)	(6.943)	(3.559)
Standard errors clustered on country	Yes	Yes	Yes
Observations	630	630	630
Log Likelihood	-449.834	-430.877	-304.439
θ	3,473.356 (17,417.010)	5,121.261 (26,526.280)	18,856.760 (111,526.000)
Akaike Inf. Crit.	981.667	993.754	690.878

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table C.15: Main models with interaction effects: without outliers

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.043*	−0.036*	−0.022
	(0.017)	(0.018)	(0.018)
Corporatism	0.160	0.155	−1.249**
	(0.630)	(0.660)	(0.435)
GDP (log)	−0.033+	−0.025	0.020
	(0.019)	(0.024)	(0.024)
Democracy	0.707+	0.916	0.180
	(0.377)	(0.561)	(0.222)
Emissions per capita (log)	2.276	1.608	−1.389
	(3.424)	(3.605)	(1.692)
Industry	0.204	0.164	0.276
	(0.242)	(0.261)	(0.260)
Trade openess	0.013*	0.014**	0.001
	(0.005)	(0.005)	(0.005)
Green party in gov.	0.424	0.456	−0.059
	(0.348)	(0.402)	(0.305)
EU member	−0.040	0.169	0.280
	(0.764)	(0.723)	(0.642)
Timetrend	0.017		
	(0.022)		
Lagged dependent			1.284***
			(0.078)
Interaction: union density and corporatism	0.007	0.011	0.041***
	(0.018)	(0.018)	(0.011)
Constant	−11.213*	−12.197+	−4.567
	(4.654)	(7.007)	(3.750)
Standard errors clustered on country	Yes	Yes	Yes
Observations	630	630	630
Log Likelihood	−449.781	−430.776	−302.758
θ	3,531.458 (17,933.770)	5,155.025 (26,938.190)	19,132.920 (113,125.200)
Akaike Inf. Crit.	983.563	995.552	689.517

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Lagged indepedendent variables

Table C.16: Main models, lagged independent variables (1 year)

	Dependent variable:		
	Newly adopted climate laws		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.020	−0.016	−0.039*
	(0.026)	(0.026)	(0.024)
Corporatism	0.093	0.183	−0.150
	(0.215)	(0.222)	(0.176)
GDP (log)	−0.024	−0.015	0.019
	(0.029)	(0.036)	(0.028)
Democracy	0.953***	0.504	0.337
	(0.366)	(0.577)	(0.278)
Emissions per capita (log)	5.492	3.583	2.353
	(3.359)	(3.392)	(1.851)
Industry	0.010	−0.069	−0.165***
	(0.086)	(0.104)	(0.049)
Trade openess	0.003	0.005	−0.003
	(0.005)	(0.004)	(0.004)
Green party in gov.	0.186	0.149	0.219
	(0.312)	(0.317)	(0.203)
EU member	−0.424	−0.499	−0.282
	(0.377)	(0.390)	(0.369)
Timetrend	0.021		
	(0.026)		
Lagged dependent			0.683***
			(0.097)
Constant	−19.171***	−13.190**	−12.349***
	(4.166)	(5.763)	(3.299)
Standard errors clustered on country	Yes	Yes	Yes
Observations	643	643	643
Log Likelihood	−545.223	−528.521	−406.415
θ	5.750* (3.124)	9.241 (7.112)	17.233*** (6.339)
Akaike Inf. Crit.	1,172.447	1,189.041	894.830
Note:			*p<0.1; **p<0.05; ***p<0.01
			Country fixed effects on all models

Table C.17: Main models with interaction effects, lagged independent variables (1 year)

	Dependent variable:		
	Newly adopted climate laws		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.018	−0.014	−0.039
	(0.027)	(0.027)	(0.024)
Corporatism	0.644	0.727	−0.093
	(0.561)	(0.608)	(0.558)
GDP (log)	−0.025	−0.015	0.020
	(0.031)	(0.037)	(0.027)
Democracy	0.956***	0.516	0.338
	(0.369)	(0.572)	(0.278)
Emissions per capita (log)	4.965	3.064	2.300
	(3.181)	(3.094)	(1.694)
Industry	0.019	−0.058	−0.164***
	(0.090)	(0.110)	(0.052)
Trade openess	0.003	0.005	−0.003
	(0.005)	(0.004)	(0.004)
Green party in gov.	0.200	0.160	0.219
	(0.313)	(0.319)	(0.204)
EU member	−0.444	−0.522	−0.286
	(0.366)	(0.376)	(0.374)
Timetrend	0.020		
	(0.026)		
Lagged dependent			0.682***
			(0.098)
Interaction: union density and corporatism	−0.016	−0.016	−0.002
	(0.016)	(0.018)	(0.016)
Constant	−18.532***	−12.678**	−12.300***
	(4.132)	(5.581)	(3.190)
Standard errors clustered on country	Yes	Yes	Yes
Observations	643	643	643
Log Likelihood	−544.900	−528.208	−406.416
θ	5.867* (3.233)	9.608 (7.636)	17.601*** (6.576)
Akaike Inf. Crit.	1,173.800	1,190.416	896.832

Note: *p<0.1; **p<0.05; ***p<0.01
Country fixed effects on all models

Table C.18: Main models, lagged independent variables (2 years)

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.005	0.002	−0.036
	(0.027)	(0.025)	(0.022)
Corporatism	−0.390	-0.432^{+}	−0.106
	(0.284)	(0.253)	(0.196)
GDP (log)	0.016	0.021	0.008
	(0.028)	(0.031)	(0.031)
Democracy	1.071^{*}	0.433	0.142
	(0.425)	(0.530)	(0.280)
Emissions per capita (log)	6.592^{**}	4.407^{*}	3.164^{+}
	(2.203)	(2.100)	(1.765)
Industry	0.133	0.055	−0.089
	(0.099)	(0.102)	(0.058)
Trade openess	0.004	0.004	−0.002
	(0.003)	(0.003)	(0.002)
Green party in gov.	0.137	0.050	0.180
	(0.376)	(0.334)	(0.195)
EU member	0.613	0.492	0.778
	(0.544)	(0.579)	(0.559)
Timetrend	0.018		
	(0.033)		
Lagged dependent			0.666^{***}
			(0.090)
Constant	-21.674^{***}	-13.717^{*}	-9.882^{**}
	(4.095)	(5.905)	(3.281)
Standard errors clustered on country	Yes	Yes	Yes
Observations	643	643	643
Log Likelihood	−558.015	−543.549	−413.493
θ	5.385^{*} (2.739)	6.960^{+} (4.173)	17.256^{**} (6.239)
Akaike Inf. Crit.	1,198.029	1,219.098	908.986

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table C.19: Main models with interaction effects, lagged independent variables (2 years)

	Dependent variable:		
	Newly adopted climate laws		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.006	0.0001	−0.036
	(0.026)	(0.025)	(0.022)
Corporatism	−0.596	−0.805	−0.228
	(0.625)	(0.568)	(0.432)
GDP (log)	0.016	0.021	0.008
	(0.027)	(0.030)	(0.031)
Democracy	1.071**	0.424	0.141
	(0.425)	(0.541)	(0.280)
Emissions per capita (log)	6.785***	4.749**	3.269*
	(2.268)	(2.152)	(1.775)
Industry	0.128	0.045	−0.092
	(0.099)	(0.105)	(0.059)
Trade openess	0.004	0.004	−0.002
	(0.003)	(0.004)	(0.002)
Green party in gov.	0.134	0.047	0.178
	(0.380)	(0.333)	(0.196)
EU member	0.622	0.504	0.785
	(0.540)	(0.577)	(0.557)
Timetrend	0.018		
	(0.033)		
Lagged dependent			0.666***
			(0.090)
Interaction: union density and corporatism	0.006	0.011	0.004
	(0.014)	(0.014)	(0.012)
Constant	−21.911***	−14.051**	−10.006***
	(4.284)	(6.141)	(3.385)
Standard errors clustered on country	Yes	Yes	Yes
Observations	643	643	643
Log Likelihood	−557.969	−543.409	−413.476
θ	5.370** (2.726)	6.900* (4.108)	17.190*** (6.202)
Akaike Inf. Crit.	1,199.938	1,220.817	910.952

Note: *p<0.1; **p<0.05; ***p<0.01
Country fixed effects on all models

Table C.20: Main models, lagged independent variables (3 years)

	Dependent variable:		
	Yearly adopted climate policies		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.005	0.002	−0.036
	(0.027)	(0.025)	(0.022)
Corporatism	−0.390	-0.432^{+}	−0.106
	(0.284)	(0.253)	(0.196)
GDP (log)	0.016	0.021	0.008
	(0.028)	(0.031)	(0.031)
Democracy	1.071^{*}	0.433	0.142
	(0.425)	(0.530)	(0.280)
Emissions per capita (log)	6.592^{**}	4.407^{*}	3.164^{+}
	(2.203)	(2.100)	(1.765)
Industry	0.133	0.055	−0.089
	(0.099)	(0.102)	(0.058)
Trade openess	0.004	0.004	−0.002
	(0.003)	(0.003)	(0.002)
Green party in gov.	0.137	0.050	0.180
	(0.376)	(0.334)	(0.195)
EU member	0.613	0.492	0.778
	(0.544)	(0.579)	(0.559)
Timetrend	0.018		
	(0.033)		
Lagged dependent			0.666^{***}
			(0.090)
Constant	-21.674^{***}	-13.717^{*}	-9.882^{**}
	(4.095)	(5.905)	(3.281)
Standard errors clustered on country	Yes	Yes	Yes
Observations	643	643	643
Log Likelihood	−558.015	−543.549	−413.493
θ	5.385^{*} (2.739)	6.960^{+} (4.173)	17.256^{**} (6.239)
Akaike Inf. Crit.	1,198.029	1,219.098	908.986

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Table C.21: Main models with interaction effects, lagged independent variables (3 years)

	Dependent variable:		
	Newly adopted climate laws		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.006	0.0001	−0.036
	(0.026)	(0.025)	(0.022)
Corporatism	−0.596	−0.805	−0.228
	(0.625)	(0.568)	(0.432)
GDP (log)	0.016	0.021	0.008
	(0.027)	(0.030)	(0.031)
Democracy	1.071**	0.424	0.141
	(0.425)	(0.541)	(0.280)
Emissions per capita (log)	6.785***	4.749**	3.269*
	(2.268)	(2.152)	(1.775)
Industry	0.128	0.045	−0.092
	(0.099)	(0.105)	(0.059)
Trade openess	0.004	0.004	−0.002
	(0.003)	(0.004)	(0.002)
Green party in gov.	0.134	0.047	0.178
	(0.380)	(0.333)	(0.196)
EU member	0.622	0.504	0.785
	(0.540)	(0.577)	(0.557)
Timetrend	0.018		
	(0.033)		
Lagged dependent			0.666***
			(0.090)
Interaction: union density and corporatism	0.006	0.011	0.004
	(0.014)	(0.014)	(0.012)
Constant	−21.911***	−14.051**	−10.006***
	(4.284)	(6.141)	(3.385)
Standard errors clustered on country	Yes	Yes	Yes
Observations	643	643	643
Log Likelihood	−557.969	−543.409	−413.476
θ	5.370** (2.726)	6.900* (4.108)	17.190*** (6.202)
Akaike Inf. Crit.	1,199.938	1,220.817	910.952
Note:			*p<0.1; **p<0.05; ***p<0.01
			Country fixed effects on all models

Appendix D

Robustness

This chapter presents different models, in order to assess the robustness of the results from the main models. Table D.1 to D.4 presents the Poisson models with different specifications. Based on the AIC and the rootograms, which can be seen in appendix E, the negative binomial models are better fitted to my data. Table D.4 presents the results from Poisson models that include the same specifications as the main negative binomial models. Table D.5 present the dichotomous measurement of annually adopted climate policies. In this model, the coefficients of the variables of interest are not significant. This suggests that union density and corporatism might be of more importance for predicting the count of yearly adopted climate policies than adoption of climate policies alone. Table D.6 contains the results from the hurdle model, a model that attempts to account for many zeros in the dependent variable. The results here are not significant, but the model fit seems to be better for the negative binomial (see appendix E).

Poisson and quasipoisson

Table D.1: Base models: Poisson

	Yearly adopted climate policies					
	count1					
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	-0.155^{***}		-0.157^{***}	-0.035^{+}	-0.101^{***}	-0.043^{*}
	(0.015)		(0.017)	(0.019)	(0.020)	(0.019)
Corporatism		-0.422	0.225	0.405	-0.143	0.375
		(0.400)	(0.386)	(0.331)	(0.219)	(0.302)
Lagged dependent					0.654^{***}	
					(0.092)	
Timetrend						0.084^{***}
						(0.015)
Constant	2.754^{***}	-0.748^{***}	2.901^{***}	-0.553	0.732	-3.346^{**}
	(0.280)	(0.209)	(0.424)	(0.844)	(0.559)	(1.041)
Year fixed effects	No	No	No	Yes	No	No
Standard errors clustered on country	Yes	Yes	Yes	Yes	Yes	Yes
Observations	897	994	851	851	851	851
Log Likelihood	−777.486	−944.373	−732.715	−658.977	−505.134	−694.182
Akaike Inf. Crit.	1,630.971	1,960.746	1,539.430	1,447.954	1,086.268	1,464.365

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table D.2: Poisson and quasi-poisson models

	Dependent variable:					
	Yearly adopted climate policies					
	Poisson	*glm: quasipoisson* *link = log*	*Poisson*	*glm: quasipoisson* *link = log*	*Poisson*	*glm: quasipoisson* *link = log*
	Poisson	Quasi-poisson	Poisson	Quasi-poisson	Poisson	Quasi-poisson
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	−0.032	−0.032	−0.026	−0.026	−0.075**	−0.075***
	(0.026)	(0.028)	(0.028)	(0.029)	(0.028)	(0.019)
Corporatism	0.777	0.777	0.690	0.690	−0.506	−0.506
	(0.785)	(0.842)	(0.818)	(0.839)	(0.827)	(0.550)
Logged GDP	1.039**	1.039**	1.031+	1.031+	0.485	0.485*
	(0.356)	(0.382)	(0.595)	(0.610)	(0.314)	(0.209)
Democracy	1.120	1.120	−0.274	−0.274	1.897	1.897
	(2.991)	(3.208)	(3.198)	(3.278)	(3.157)	(2.097)
Logged emissions per capita	0.050	0.050	0.006	0.006	−0.098	−0.098
	(0.121)	(0.130)	(0.129)	(0.132)	(0.106)	(0.070)
Industry	−0.063*	−0.063+	−0.047	−0.047	0.016	0.016
	(0.032)	(0.034)	(0.034)	(0.035)	(0.028)	(0.018)
Trade openness	0.017*	0.017*	0.020**	0.020**	0.006	0.006
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.004)
Green party in gov.	0.446	0.446	0.448	0.448	0.342	0.342+
	(0.336)	(0.361)	(0.356)	(0.364)	(0.309)	(0.206)
EU member	0.177	0.177	0.273	0.273	0.436	0.436
	(0.772)	(0.828)	(0.778)	(0.798)	(0.766)	(0.509)
Timetrend	0.025	0.025				
	(0.023)	(0.025)				
Lagged dependent					0.640***	0.640***
					(0.040)	(0.026)
UD:CorpAll	−0.004	−0.004	0.002	0.002	0.018	0.018
	(0.021)	(0.023)	(0.022)	(0.023)	(0.022)	(0.014)
Constant	−11.279**	−11.279**	−9.615	−9.615	−8.595*	−8.595**
	(3.965)	(4.254)	(6.231)	(6.387)	(4.254)	(2.826)
Year fixed effects	No	No	Yes	Yes	No	No
Observations	664	664	664	664	664	664
Log Likelihood	−520.853		−496.855		−385.582	
Akaike Inf. Crit.	1,127.706		1,129.710		857.164	
Note:				+ p<0.1; * p<0.05; ** p<0.01; *** p<0.001		
				Country fixed effects on all models		

Table D.3: Poisson models with different offsets

	Dependent variable:								
	Yearly adopted climate policies								
	Ignorable offset	Offset in equation	Offset outside of equation	Ignorable offset	Offset in equation	Offset outside of equation	Ignorable offset	Offset in equation	Offset outside of equation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Union density	-0.032^{+}	-0.032^{+}	-0.032^{+}	−0.026	−0.026	−0.025	-0.075^{**}	−0.026	-0.080^{**}
	(0.019)	(0.019)	(0.019)	(0.018)	(0.018)	(0.018)	(0.025)	(0.026)	(0.028)
Corporatism	0.777	0.709	0.710	0.690	0.655	0.663	−0.506	0.655	−0.567
	(0.533)	(0.535)	(0.543)	(0.570)	(0.577)	(0.582)	(0.466)	(0.451)	(0.469)
Logged GDP	1.039^{*}	0.981^{*}	0.943^{*}	1.031	1.008	0.985	0.485^{*}	1.008^{***}	0.529^{*}
	(0.474)	(0.472)	(0.476)	(0.654)	(0.665)	(0.675)	(0.223)	(0.237)	(0.247)
Democracy	1.120	1.618	2.017	−0.274	0.263	0.467	1.897	0.263	1.858
	(3.209)	(3.339)	(3.598)	(3.515)	(3.674)	(3.714)	(2.794)	(3.003)	(2.765)
Logged emissions per capita	0.050	0.041	0.033	0.006	0.004	0.0003	-0.098^{*}	0.004	-0.102^{*}
	(0.062)	(0.060)	(0.062)	(0.079)	(0.079)	(0.081)	(0.048)	(0.053)	(0.044)
Industry	-0.063^{*}	-0.060^{*}	-0.057^{+}	−0.047	−0.044	−0.043	0.016	−0.044	0.010
	(0.032)	(0.031)	(0.030)	(0.034)	(0.033)	(0.033)	(0.025)	(0.029)	(0.023)
Trade openness	0.017^{**}	0.016^{*}	0.016^{*}	0.020^{**}	0.019^{**}	0.019^{**}	0.006	0.019^{***}	0.006
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.003)	(0.004)	(0.004)
Green party in gov.	0.446	0.422	0.421	0.448	0.421	0.422	0.342	0.421^{+}	0.330
	(0.387)	(0.389)	(0.386)	(0.426)	(0.432)	(0.433)	(0.246)	(0.244)	(0.248)
EU member	0.177	−0.123	−0.369	0.273	0.033	−0.075	0.436	0.033	0.439
	(0.809)	(0.756)	(0.869)	(0.748)	(0.728)	(0.874)	(0.720)	(0.687)	(0.772)
Timetrend	0.025	0.005	−0.019						
	(0.030)	(0.029)	(0.044)						
Offset: independent years, logged			2.166^{+}			1.591			−0.278
			(1.277)			(1.240)			(0.647)
Lagged dependent							0.640^{***}		0.639^{***}
							(0.124)		(0.122)
UD:CorpAll	−0.004	−0.002	−0.002	0.002	0.003	0.003	0.018	0.003	0.019
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.013)	(0.013)	(0.013)
Constant	-11.279^{*}	-14.168^{**}	-17.630^{**}	−9.615	-13.411^{+}	-15.502^{+}	-8.595^{***}	-13.411^{***}	-7.735^{*}
	(4.557)	(4.595)	(5.922)	(7.381)	(7.529)	(8.267)	(2.560)	(2.800)	(3.211)
Year fixed effects	No	No	No	Yes	Yes	Yes	No	No	No
Standard errors clustered by country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	664	643	643	664	643	643	664	643	643
Log Likelihood	−520.853	−514.332	−514.078	−496.855	−490.589	−490.533	−385.582	−490.589	−380.762
Akaike Inf. Crit.	1,127.706	1,112.664	1,114.157	1,129.710	1,115.179	1,117.067	857.164	1,115.179	847.523

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects on all models

Table D.4: Poisson models with and without interaction effects

	Dependent variable:					
	Yearly adopted climate policies					
	Timetrend	FE	AR(1)	Timetrend	FE	AR(1)
	(1)	(2)	(3)	(4)	(5)	(6)
Union density	-0.032^{+}	-0.026	-0.061^{*}	-0.032^{+}	-0.026	-0.064^{*}
	(0.019)	(0.018)	(0.028)	(0.019)	(0.018)	(0.026)
Corporatism	0.651^{**}	0.765^{***}	0.108	0.709	0.655	-0.475
	(0.239)	(0.206)	(0.167)	(0.535)	(0.577)	(0.451)
GDP (log)	-0.060^{*}	-0.045	0.029	-0.060^{*}	-0.044	0.029
	(0.030)	(0.033)	(0.029)	(0.031)	(0.033)	(0.029)
Democracy	0.982^{*}	1.006	0.259	0.981^{*}	1.008	0.270
	(0.468)	(0.661)	(0.244)	(0.472)	(0.665)	(0.237)
Emissions per capita (log)	1.663	0.190	2.026	1.618	0.263	2.598
	(3.454)	(3.718)	(3.228)	(3.339)	(3.674)	(3.003)
Industry	0.040	0.006	-0.081	0.041	0.004	-0.087
	(0.060)	(0.077)	(0.053)	(0.060)	(0.079)	(0.053)
Trade openess	0.016^{*}	0.019^{**}	0.003	0.016^{*}	0.019^{**}	0.003
	(0.006)	(0.006)	(0.004)	(0.006)	(0.006)	(0.004)
Green party in gov.	0.420	0.425	0.284	0.422	0.421	0.277
	(0.385)	(0.430)	(0.241)	(0.389)	(0.432)	(0.244)
EU member	-0.117	0.012	0.125	-0.123	0.033	0.184
	(0.775)	(0.742)	(0.696)	(0.756)	(0.728)	(0.687)
Timetrend	0.005			0.005		
	(0.029)			(0.029)		
Lagged dependent			0.629^{***}			0.631^{***}
			(0.123)			(0.125)
Interaction: union density and corporatism				-0.002	0.003	0.018
				(0.015)	(0.015)	(0.013)
Constant	-14.243^{**}	-13.295^{+}	-10.314^{***}	-14.168^{**}	-13.411^{+}	-11.059^{***}
	(4.514)	(7.387)	(2.936)	(4.595)	(7.529)	(2.800)
Observations	643	643	643	643	643	643
Log Likelihood	-514.335	-490.601	-382.015	-514.332	-490.589	-381.684
Akaike Inf. Crit.	1,110.671	1,113.202	846.030	1,112.664	1,115.179	847.367

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001
Country fixed effects and country-clustered standard errors on all models

Other regression models

Table D.5: Logistic regression

	Dependent variable:		
	Adopted climate policy		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Union density	−0.045	−0.046	−0.010
	(0.041)	(0.050)	(0.018)
Corporatism	−0.962	−0.950	−0.738
	(1.323)	(1.443)	(0.670)
GDP (log)	1.018	1.086	0.482*
	(0.675)	(1.179)	(0.259)
Democracy	−2.615	−4.911	−1.870
	(5.581)	(6.853)	(2.334)
Emissions per capita (log)	0.189	0.139	0.955*
	(0.417)	(0.424)	(0.499)
Industry	0.001	0.030	0.031
	(0.060)	(0.068)	(0.027)
Trade openess	0.021*	0.021	0.005
	(0.012)	(0.015)	(0.005)
Green party in gov.	0.566	0.624	0.110
	(0.576)	(0.692)	(0.227)
EU member	−0.252	0.020	−0.176
	(1.037)	(1.140)	(0.343)
Timetrend	0.074		
	(0.045)		
Lagged dependent variable			50.268***
			(0.136)
Interaction: union density and corporatism	0.038	0.044	0.009
	(0.030)	(0.035)	(0.014)
Constant	−10.437	−7.609	−20.401***
	(8.339)	(13.575)	(6.060)
Standard errors clustered on country	Yes	Yes	Yes
Observations	664	664	664
Log Likelihood	−310.937	−289.412	−0.000
Akaike Inf. Crit.	707.873	714.824	86.000

Note: *p<0.1; **p<0.05; ***p<0.01
Country fixed effects on all models

Table D.6: Hurdle models

	Timetrend	FE	AR(1)
Count model: (Intercept)	-1.67	-0.99	-2.80
Count model: Union density	-0.00	0.01	-0.08
Count model: Corporatism	0.65	0.60	-0.14
Count model: GDP (log)	0.66	0.58	0.09
Count model: Emissions per capita (log)	0.01	-0.01	-0.18
Count model: Industry	-0.17	-0.14	0.00
Count model: Trade openess	0.01	0.02	0.00
Count model: Green party in gov.	0.52	0.51	0.13
Count model: EU member	20.30	-0.97	2.96
Count model: Timetrend	-0.02		
Count model: Theta (log)	4.13	8.51	13.18
Zero model: (Intercept)	-12.86^{*}	-8.51	-23.18
	(5.68)	(8.63)	(736258.14)
Zero model: Union density	-0.03	-0.04	-0.01
	(0.04)	(0.04)	(4773.88)
Zero model: Corporatism	0.04	0.22	-0.44
	(0.68)	(0.69)	(95174.31)
Zero model: GDP (log)	0.96	0.78	0.45
	(0.59)	(0.89)	(60021.18)
Zero model: Emissions per capita (log)	0.17	0.14	0.80
	(0.27)	(0.29)	(60068.37)
Zero model: Industry	0.01	0.04	0.04
	(0.06)	(0.06)	(6573.43)
Zero model: Trade openess	0.02	0.02	0.00
	(0.01)	(0.01)	(1428.31)
Zero model: Green party in gov.	0.63	$0.86^{\cdot}$	0.14
	(0.48)	(0.51)	(53250.63)
Zero model: Eu member	-0.27	-0.11	-0.13
	(0.87)	(0.87)	(82463.38)
Zero model: Timetrend	$0.08^{\cdot}$		
	(0.04)		
Count model: Lagged dependent			0.64
Zero model: Lagged dependent			50.27
			(28102.28)
AIC	1255.72	1288.96	478.44
Log Likelihood	-540.86	-507.48	-152.22
Num. obs.	707	707	707

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Appendix E

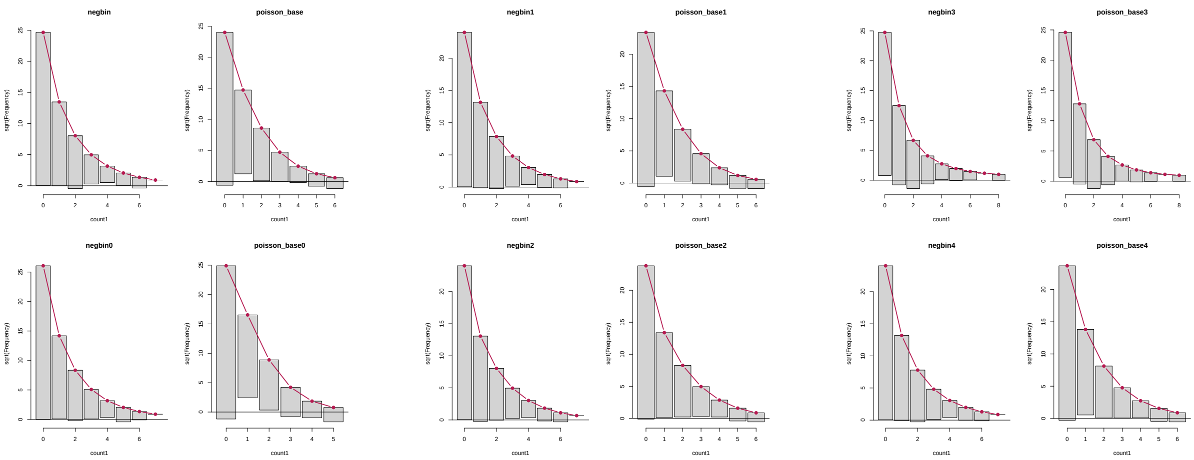
Diagnostics

In this appendix, I present different diagnostics of the main models. First, I present the rootograms in figures E.1 to E.4. Figure E.5 presents a comparison of the fit of different models. Table E.1 and E.2 presents the VIF test. Last, I present the results from the Hausman test.

Rootograms

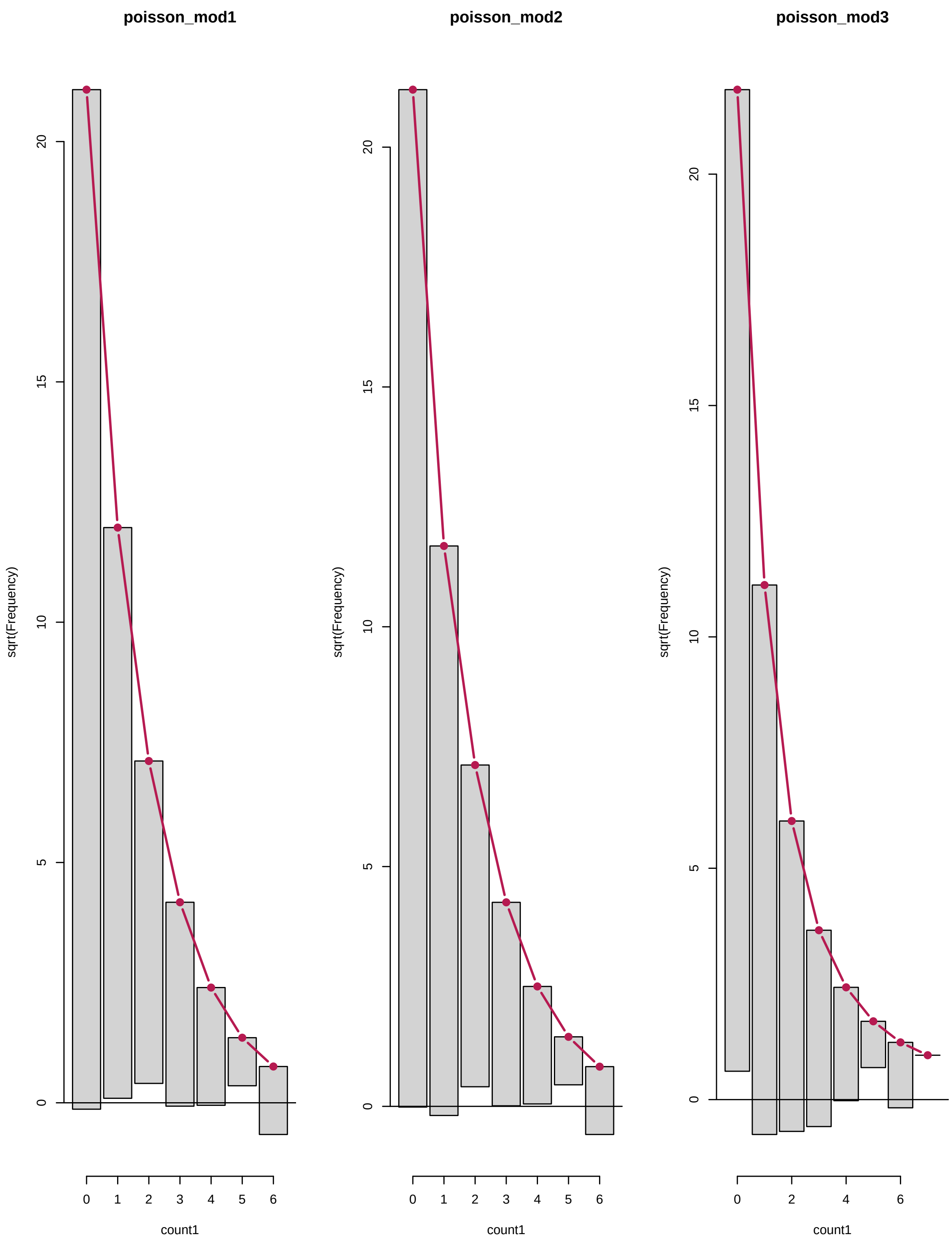
Plotting rootograms is a visual way of diagnosing over- and underdispersion in a count model. The y-axis presents the square root of the expected frequency of the count of annually adopted climate policies. The x-axis presents the specific counts. The bars that hang from the expected frequency represent how well the model predicts occurrences of the different counts. When the bars do not reach 0, it means that the model overpredicts the count. If the bars exceed 0, the model underpredicts the count (Ward & Ahlquist, 2018, p. 200). None of the rootograms are very concerning.

Figure E.1: Rootograms for Poisson and Negative Binomial models without covariates



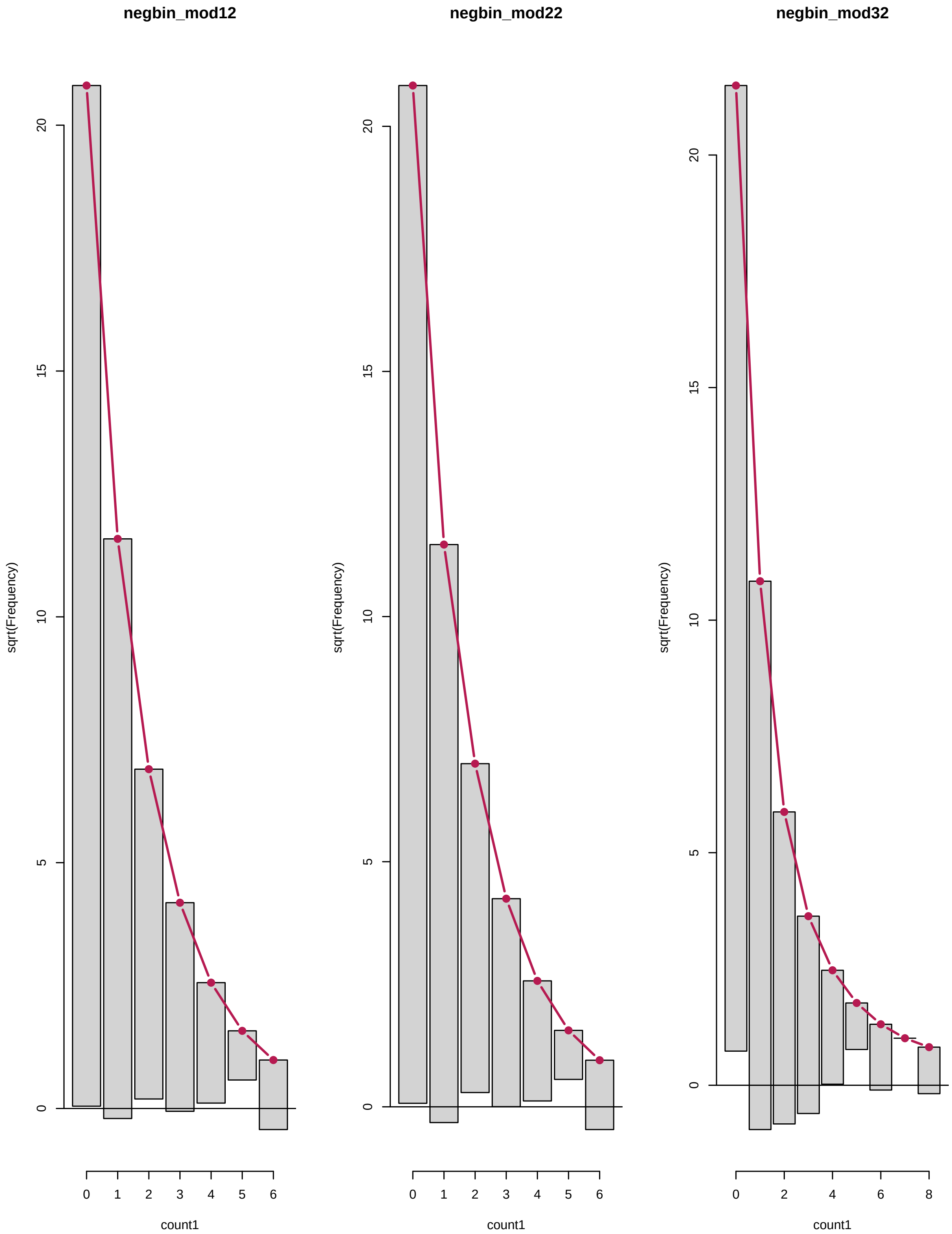
In the order: (1) Negative Binomial, (2) Poisson etc.

Figure E.2: Rootograms for Poisson models with covariates



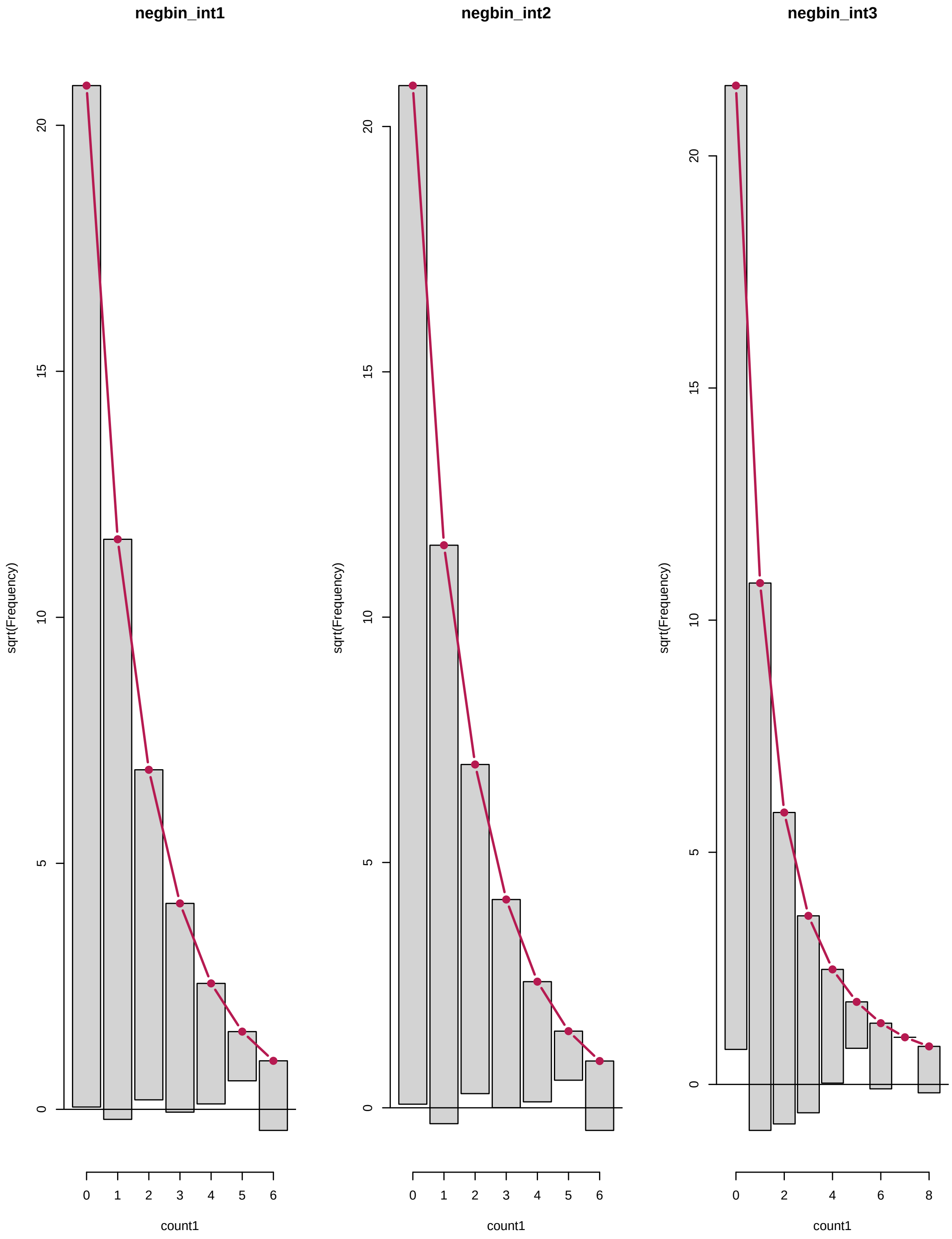
(1) Timetrend (2) FE (3) AR(1)

Figure E.3: Rootograms for Negative Binomial models with covariates



(1) Timetrend (2) FE (3) AR(1)

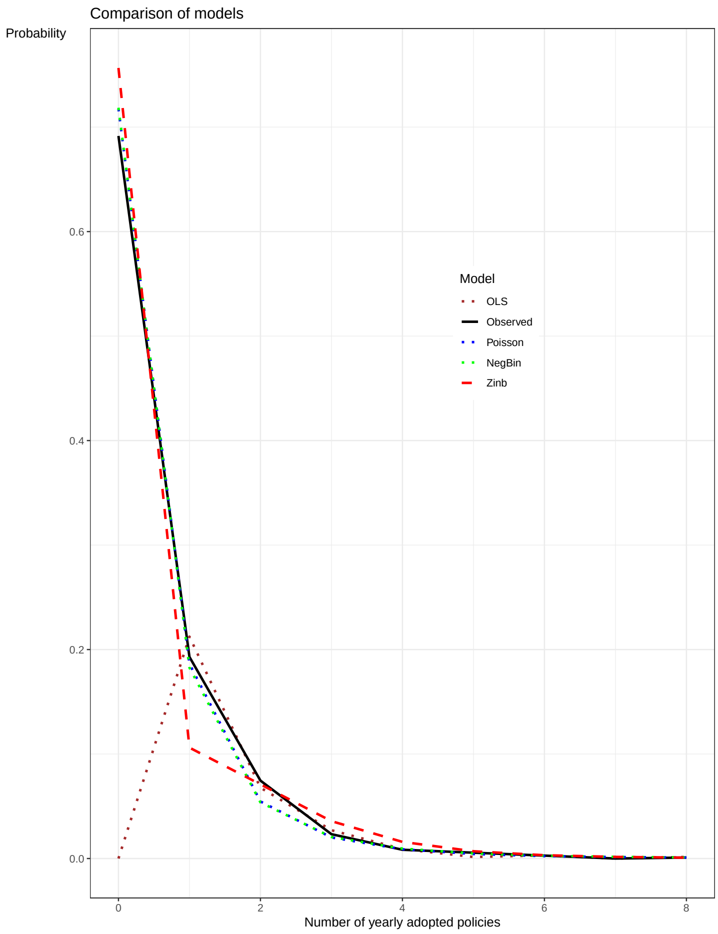
Figure E.4: Rootograms for Negative Binomial models with interaction



(1) Timetrend (2) FE (3) AR(1)

Comparisons of models

Figure E.5: Comparisons of count models



Zinb = Hurdle

Variance inflation factor test

Variance inflation factor (VIF) tests are performed in order to test if there are multicollinearity in the regression models. Usually, values over 5 or 10 are considered moderate to high and very high. As evident from table E.1, there are a few higher values returned from the VIF-tests of the main models. I have tested these models without the potentially problematic values, and this did not significantly change results. Moreover, the variable with the highest VIF score is the union density variable, which is significant. Removing it when the results indicate that multicollinearity might not be problematic seems like a strange choice. Removing corporatism does not change the coefficients of union density significantly. Thus, based on this, and the results from table E.2, I conclude that they are not problematic. However, results could suffer from too large uncertainty or unstable results as a result of this decision.

Table E.1: Variance inflation factor test, main models

	Model 1	Model 2	Model 3
Union density	6.857381	7.970157	7.065305
Corporatism	2.623324	2.724805	2.778701
GDP (log)	1.605952	4.416223	1.108160
Democracy	1.094259	1.307027	1.129355
Emissions per capita (log)	3.141945	3.65169	2.767611
Industry	1.044443	1.264342	8.318457
Trade openness	4.900858	5.942680	3.730953
Green party in gov.	1.113041	1.287380	1.001646
EU member	3.584051	3.894421	3.718338
Country dummies	6.114854	4.250349	4.017251

Table E.2: Main models without variables with problematic VIF values

	Dependent variable:		
	Newly adopted climate policies		
	Timetrend	FE	AR(1)
	(1)	(2)	(3)
Corporatism	0.549	0.396	−0.116
	(0.390)	(0.382)	(0.360)
Industry	−0.046	−0.009	
	(0.033)	(0.035)	
GDP (log)	0.994**	0.444	0.843***
	(0.351)	(0.534)	(0.232)
Democracy	3.410	2.982	0.740
	(2.246)	(2.382)	(2.209)
Emissions per capita (log)	0.108	0.064	−0.085
	(0.134)	(0.138)	(0.099)
Trade openness	0.014*		0.007
	(0.006)		(0.005)
Green party in gov.	0.701*	0.698*	0.293
	(0.327)	(0.334)	(0.263)
EU member	−0.338	−0.077	−0.028
	(0.530)	(0.517)	(0.510)
Time trend	0.047*		
	(0.022)		
Lagged dependent			0.815***
			(0.043)
Constant	−14.470***	−7.688	−12.637***
	(3.758)	(5.552)	(3.004)
Robust standard errors clustered on country	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Observations	751	751	817
Log Likelihood	−587.754	−571.335	−428.556
θ	4.926* (2.373)	6.342+ (3.620)	10,717.660 (45,710.830)
Akaike Inf. Crit.	1,257.508	1,272.670	937.113

Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001

Hausman test

The null hypothesis of a Hausman test is always that random effects is the preferred approach. Thus, because of the significance, the null hypothesis is rejected and fixed effects is the preferred approach in this case. Some scholars criticize the usage of a Hausman test (Bell & Jones, 2015, p. 138), and argue that one should always pursue models that take the approach of both random and fixed effects. These models are called within-between models (Bell & Jones, 2015, p. 141). Unfortunately, these models demand a lot from data, and I was therefore unable to test these.

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	Hausman Test

data:  count1 ~ UD + CorpAll + Industry + logGDP + Dem + logemissions +  ...
chisq = 40.592, df = 9, p-value = 5.934e-06
alternative hypothesis: one model is inconsistent
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