DEPARTMENT OF POLITICAL SCIENCE

ARE WOMEN LEADERS OF NATURE?

- a quantitative study on the effect of women's political representation on environmental politics in European countries.

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Abstract

Environmental politics is becoming an increasingly important field because of severe issues like climate change. Research has argued that women care more for the environment. Meanwhile, female politicians in national parliaments are reported to have stronger environmental concerns and be more supportive of environmental protection than their male colleagues, but it is still unsure if they exhibit these characteristics in their decision-making. The purpose of this study is to capture the effect of women's political presence on environmental outputs which has not previously been tested much empirically from a cross-country perspective. A quantitative method with a statistical analysis is used on cross-sectional, time-series data from 34 European countries to test if an increase in the proportion of seats held by women in national parliaments have a positive effect on climate change legislation, joining environmental agreements and decreasing greenhouse gas emissions. The result of the analysis finds little support to the suggested hypothesis of a positive effect, except for joining environmental agreements that showed significance. The correlating trend of gender equality in the parliaments and improving environmental politics might instead be due to modernization. However, it cannot be ruled out by this analysis that an increase of the number of women in national parliament does not have a positive effect on environmental politics. Further research is needed to determine how the environment is prioritized by female politicians in order to study the effect of their presence.

Keywords: women's political representation, environmental politics, gender differences, climate change legislation, environmental agreements, greenhouse gas emissions.

1. Introduction

Environmental problems such as climate change are becoming the defining question of our time. The climate change issue is without a doubt complex, requiring a new way of thinking about our environment and finding new solutions to old ways of living. What are the driving forces and who carries a larger responsibility for this transformation? Many would arguably say political leaders. Do women differ from men when it comes to political decision-making on the environment? Research studies have shown that women have more concern for environmental problems and tend to be more aware of environmental risks than men, while also choosing a more sustainable lifestyle such as littering less, recycling more and leaving a smaller carbon footprint. This behavior pattern also seems to hold across age groups and countries. Some researchers have suggested that personality differences might explain this gender gap in environmental behavior. (Brough & Wilkie, 2017).

In a study made by Ramstetter & Habersack (2019), female representatives in the European parliament were found more likely to hold pro-environmental attitudes than their male colleagues. This was also reflected in their legislative behavior as they were significantly more likely to support environmental legislation, even after controlling for ideology and nationality. It seems as if women's environmental characteristics is reflected in their political representation and they use their political power in the decision-making process to improve the environment.

The overall research on environmental attitudes and behavior seem consistent in the results on gender differences but there is a need for more research on the effect of women's environmental behavior in the political field. Especially lacking is the research on the effect of women's political presence in parliaments on environmental outputs and outcomes with a cross-country comparative method (Wängnerud, 2009. p.66).

Exploring this question could potentially highlight some important gender differences in men and women's political priorities. While contributing empirically to the research on the *effect* of women's political representation on environmental outcomes, which has previously been under researched, it might perhaps also shed some light onto the importance of gender equality and diversity in the political decisions necessary for solving environmental problems. In this thesis I will therefore test whether an increase in the number of elected women in national parliaments in 34 European countries will have a positive effect on the decision-making in environmental politics, ultimately leading to an improvement in environmental outputs and outcomes.

This will be done by using a quantitative method and conducting three statistical regression analysis using time-series data on the proportion of seats held by women in each country's national parliaments between the years 1990-2018. The effect will be measured by legislative outputs, such as the number of implemented active climate laws and the ratification of eleven selected environmental agreements. I will also be looking at the effect on environmental outcomes, which in this case will be measured as the level of greenhouse gas emissions.

As a preview of the result, it can be said that the initial analysis done found a positive correlation between the increase of the number of women in national parliaments with the number of climate laws and ratification of environmental agreements but also with an increase in the level of greenhouse gas emission. Countries with a higher number of women in the parliament were found to perform better in this regard than countries with a lower number of women. This positive effect persisted even when introducing the control variables; corruption, level of democracy and economic development, however the effect on emissions was reversed and levels decreased. Furthermore, when using country- and year dummy variables in the two last models of the regression analysis, a large part of the variance could be explained but only the regression model for environmental agreements still showed statistical significance for the proportion of seats held by women in the parliament. The effect is relatively low. However, the analysis might not be able to fully explain the reoccurring pattern of some progressive countries, meaning that while my hypothesis did not find enough support, it cannot be completely rejected. The results also show some indications that both gender equality in the national parliament and better environmental performance might be symptoms of modernization and especially the absence or presence of legislature corruption seemed to be an important factor,

In the next chapter, I will review the two main arguments for why we should expect women to have a different approach and impact on environmental politics than their male colleagues. The case for these arguments will be made with the empirical research on gender differences in environmental attitudes and behaviors together with the theories on why these differences exists or emerges. Following this, my hypothesis will be presented using previous empirical findings to support it and explain what effect we could expect to see in the analysis. In the consecutive chapter, I will go through the method and variables chosen, disclosing their fit for answering my proposed research question. Finally, my results of the regression analysis together with discussion and my conclusions will be presented in the last two chapters.

2. Theories

In this chapter I will go through some of the empirical research and literature on gender and the environment. In the first section, I will review the empirical research on men and women's environmental attitudes and highlight some gender differences. In the following two sections, I will first explain these differences by using the argument of women's essentialism as a feminine characteristic, women might essentially have a closer relationship with nature. Next, I will turn to the rational argument, moving from the view of intrinsic properties on to self-interest, reflecting on women's exposure to environmental problems. The following section asks the question if these arguments can be translated into women's political representation and their political priorities, leading to the support of women's interest as a group. In the final paragraph, I will present my research question and hypothesis, connecting to the above arguments.

2.1. Empirical research on gender differences in environmental attitudes

What does empirical research tell us about men and women's environmental attitudes? Numerous studies have found gender differences in environmental concern, were women showed greater concern for local environmental problems with clear health risks to family and community. Women also considered a variety of environmental risks, from nuclear power to toxic substances, to be more serious in nature than men. With regards to said values and perceptions of environmental risks, research also indicates that women are more likely than men to express support for environmental protection (Norgaard & York, 2005. p.508: Sundström & McCright, 2014, p.1083).

Among elected politicians, women are more likely to exhibit a greater concern for the safety and well-being of others, perceiving a greater risk to vulnerability than men, which could be related to a greater environmental concern. Female politicians are also more likely than their male counterparts to hold value orientations such as ecocentrism, altruism and openness to change, which correlates positively with environmental concern. Furthermore, when examining Swedish citizens and politicians, Sundström & McCright (2014, p.1082) found that women reported greater environmental concern than men among citizens, elected members of municipal county assemblies as well as in the national parliament. However, on a national level, the gender differences in concern between female and male members of the Swedish parliament was largely explained by their political orientation.

These gender differences could lead to a conflict of interests, resulting in different political positioning between men and women, whereas it is likely to see a different list of political priorities if women had more power (Oskarsson & Rohdén, 2002). This suggests that a greater gender equality in the political representation may have the impact, that if women tend to be more environmentally progressive, the inclusion of women in legislation and policy-making process could positively influence state behavior. Whether a female politician votes for or against a specific legislation, her values together with gender equality values may affect the behavior of *both* women and men, creating an atmosphere in which environmentally progressive state behavior is viewed as positive. (Norgaard & York, 2005 p.508).

Most of the dozen studies done on gender differences in environmental concern among politicians exclusively analyze data from members of national parliaments. However, the results from those studies that are focusing solely on the highest political level are divided. Some have shown a positive correlation between women and environmental concern, others showed no significant effect while only a few, actually showed that men were more pro-environment. (Sundström & McCright, 2011). This is consistent with other studies suggesting that concern among parliamentarians and environmental positions at a national level may be driven more by ideology and less by individuals' personal characteristics and experiences.

2.2 The essentialist argument

Why these differences in environmental attitudes and concerns exists has not been made clear, but a possible explanation might be found in the theories about men and women's gender-based characteristics. In the early discourse on women's connection to the environment, the essentialist argument was made with essentialism being a part of a feminist ideology centered around the view that women are fundamentally different to men. Feminine values such as empathy and fostering are being distinguished from masculine values based on domination and violence. Whereas men only view their environment in terms of conquering and resources, women instead give birth to life and would seek to live in harmony with nature (Hall, 2018). This thought has since been more defined within the research field of gender and the environment and developed with the theory of eco-feminism. Men and women were described to have different relationships to nature, essentially placing women as instinctive caretakers of the environment and the destruction of nature by men was therefore also being linked with their abuse of women (Agarwal, 1992).

The result, according to eco-feminism theory, is that women have historically and culturally been linked to nature. Which in turn may actually have constructed their lives to be interknitted with their environment. This has laid the path of domination of women and nature by men, resulting in both gender discrimination and environmental degradation originating from the same social structures. According to feminist thought, both gender discrimination and environmental degradation ties to a common hierarchical social structure that simultaneously devalues both women and nature. Even institutions and social practices might be gendered (Norgaard & York, 2005. p.508-509). So, were women have for example had the traditional role of taking care of the family, their concerns might therefore be stronger in areas regarding people close to them or in their neighborhood.

This does not solely affect or apply to women. These societal norms could also steer men into the opposite direction. While it might not be that men do not care about the environment at all, but whereas women are viewed to naturally care for the environment, research suggests that men might hesitate to show an environmental-friendly behavior. There seems to be a psychological link between eco-friendliness and the perceptions of femininity, where men worry of what it could say about their masculinity and how their behavior might brand them as feminine (Brough & Wilkie, 2017). Studies in Sweden have showed that men eat more meat and use more energy in transportation, more often driving their own car, while women travel shorter distances using public transport (Räty & Carlsson-Kanyama 2010. p.646). These actions could be interpreted as either masculine or feminine. The theory that men would try to reassert their masculinity through non-environmentally-friendly choices suggests that the environment might be harmed just by making men feel feminine. (Brough & Wilkie, 2017).

2.2 The rational argument

Another perspective regarding women's environmental concern is that it might instead be driven by self-interest. To understand this, one needs to look at studies on what effect environmental problems have on women. The Intergovernmental Panel on Climate Change has stated that climate change impacts will be differently distributed between gender. Much emphasis has been put on rural women in developing countries being more negatively affected by environmental degradation and being more vulnerable to climate change disasters. Research has also argued that women are more often being discriminated and excluded from materialistic as well as socio-economic resources, enforcing the view of women as victims belonging to a poor and disadvantaged group (Dankelman, 2002: Arora-Johnson, 2012).

When women are positioned to care for the environment, they gain more knowledge of their surroundings. Holding this competence might infuse their care for environmental issues as a rationale development rather than an intrinsic property. The result might then be that women simply care more for the environment because they understand the seriousness of environmental problems such as climate change and that they as a group are of disadvantage, a position they would rationally want to change. While it might not be possible to empirically test the essentialist and rational argument, they still act as an important discussion to explore possible potential mechanisms to the suggested effect of women's presence on environmental politics.

The question here, is if female politicians in European countries would work on improving the environment on behalf of not just themselves but of all women as a group? While climate change for example will affect all and not just women in some way, it is the women in poorer, low-resilience countries that will be hit harder. The suggestion is that, female politicians might work in solidarity with women on important issues to them as a group, such as the environment.

Feminist solidarity and collective action are both ways of working to accomplish gender justice, not only in developing countries but also in the global North. Collective action can be seen as a political essential in supporting women to challenge oppression and structures that make them all vulnerable in the first place (Sweetman, 2013. p.217-218). Solidarity involves a social structure where a group identifies and is characterized by sharing a common emotional orientation and directing its contribution of resources to their collective good. Practicing politics of solidarity founded on women's 'shared problems' and a strategy of speaking as 'women' might be needed to organize politically around gender issues, having the potential to unite women across boundaries regardless of class, culture, religion and nation. (Steans, 2007. p.729).

2.4 Does political representation matter?

When it comes to why some political leaders find interest in environmental issues, it may primarily depend on their social identification. According to the social identity theory, a social identity is the individual's knowledge that he or she belongs to a social category or group. Through a thought process, the individual categorizes themselves as a member of a group that they perceive to share the same beliefs, values, behavior and other properties as they themselves find important. Within a political landscape, political leaders identify with groups through this same process (Biscotti & D'Amico, 2016. p.153). It is likely that women would categorize in some part of their identity according to their gender together with associated values.

In research, there is a much-used distinction between descriptive and substantive representation, meaning that the focus is either on the number of women elected (descriptive) or on the effects of women's presence (substantive) in parliament. The latter concerns the translation of female voters' interest into the work of elected women in parliaments. Anne Phillips (1995) presented the theory Politics of Presence, suggesting that female politicians are best equipped to represent the interests of women. Her argument is not only built upon noted differences in the everyday lives of women and men but also, the fact that female politicians, at least to some extent, share the experiences of other women such as unpaid labor when taking care of the home and family or experiencing acts of sexual harassment.

The theory also discusses whether fair representation of, for example, disadvantaged women, requires their presence in elected assemblies. As Wängnerud (2009, p.62) further explains, the theory politics of presence suggests that there is a link between descriptive and substantive representation. In her own work, she points out that the results in research is quite clear, women in parliaments tend to be more favorable toward new policies including those concerned with environmental protection. Female politicians as members of the parliament also tend to prioritize issues that are prioritized by the female voters. They also saw, to a larger extent than their male colleagues, that "representation of women's interests was part of their duty".

Based on these theories and arguments, my proposed research question here is; *does an increase in the number of women in national parliaments have an effect the environmental outcomes?*
My hypothesis is that the answer is yes and that we should expect to see a positive effect between the increasing of the number of women in national parliaments and environmental outcomes because of two main reasons. Firstly, if we assume the belief that women are more concerned for the environment to be correct, these issues should get more priority in the decision-making when the number of elected female politicians increase. They might also influence their male colleagues. Even when there is not a gendered difference in concern, there might still be a difference in priorities on environmental issues, creating a more equal decision-making and adding diversity to the debate. Secondly, if women in politics are aware that they as a group are more exposed to the negative effects of climate change, it can be expected that they will tend to prioritize these issues simply because they acknowledge them as more important to women.

3. Method

As mentioned in the previous section, the aim here is to try to capture the effect of women's political representation on environmental outcomes. In this chapter, I will therefore be doing an operationalization of concepts. This refers to a process where I more clearly define the concepts used in my thesis and translate them into variables, allowing them to be measured empirically. Furthermore, by elaborating on the choice of variables and the method of the statistical analysis, it can improve the validity of my research, such as using the accurate instruments and data to achieve the task of actually measuring the intended phenomenon.

3.1 European countries

Using statistical analysis as a method allows for good comparative research and raise reliability. This analysis will be using a sample of 34 European countries (see table 1 in appendix) as analysis units over a time period of the years between 1990-2018. A reason for looking at countries as units is because the goal of improving the environment is still largely pursued by political concern and will at a country level. It is also likely that the number of climate laws, agreements and level of emissions improves and varies over time and between countries. Therefore, using cross-sectional time series is the most useful. Moreover, there is a lack of research on environmental outcomes as an effect of women's representation and a lack of good cross-country comparative empirical research (Biscotti & D'Amico, 2016: Wängnerud, 2009).

The choice of European countries has several reasons. Firstly, it is required that the analysis contain countries that have actually acquired a higher number of women in the parliament. Most of those countries are found in Europe, while also having some countries with a lower number to compare with. Secondly, it is simply easier to find reliable and useful data on European countries over time. Finally, the sampled countries are also similar in the sense that they are now all democratically ruled, however they have had very different democratic development. This makes it possible to control for democracy, economic development as well as corruption.

It is also interesting from the perspective that, while the European Union is a key player in promoting sustainable development on a supranational level and protecting the environment through legislation, implementation of these policies has been problematic (Biscotti & D'Amico (2016). Members states are obligated to follow the environmental frameworks decided upon on EU-level, but these leave much room for how-to in the implementation process, which makes it of further to interest to explore possible differences between countries.

3.2 Women in parliaments

A large number of indicators on women's representation can, and are, used in empirical research. Here, the independent variable will be defined as the proportion of seats held by women in national parliaments. The data for this has been retrieved from The Quality of Government Institute's database (Teorell et al 2019: World Bank, 2016), using their time-series standard data. To be able to do an analysis from the year 1990, the dataset has been complemented with data from the Interparliamentary Union (IPU, 2017). There are several reasons for this choice. When looking for improvement in environmental outcomes, we must consider who would be able to have an impact and political leaders are instrumental players in the promotion or opposition of the environmental policies being implemented (Biscotti & D'Amico, 2016. p.152). Norgaard & York (2005. p.511) uses the percentage of women in the national Parliament as a key independent variable in their study on state environmentalism, stating that they are following the lead of the UN Commission on the Status of Women. While recognizing that women in parliament might not always be the best indicator of women's political power, they are, however, not aware of any better cross-national indicator.

The number of women in the parliament is also interesting from another perspective. Scholars have tried to identify a threshold number or a tipping point, where the impact of women's presence in parliaments becomes obvious. The UN Commission on the Status of Women estimated already in 1990, the threshold of 30% women in the parliament, for them to be able to influence key outcomes and be taken seriously, (Norgaard & York, 2005). This concept, named 'critical mass', has seen other suggestions for thresholds. For example, 15% of women in the parliament may be enough to allow female politicians to change the political agenda while 40% is needed for specific policies to be introduced. (Wängnerud, 2009. p.60).

The aim of this analysis is to capture the effect of women's political representation on environmental outcomes. When looking at the political work of men and women, researcher Sue Thomas found differences in their priorities. In her book, "How Women Legislate", she distinguishes between legislative procedures and legislative products. Legislative procedures include activities such as speeches and working with colleagues. Legislative products include, for example, voting records and policy priorities. Her findings show a closing gap between women and men concerning how they work with procedures but not when it comes to products. She concludes that female legislators take on priorities dealing with issues of women, children and the family, while men do not share this priority list (1994, p.7)

3.3 Dependent variables

It is hard to capture the *effects* of the increased number of women elected. We are now aware of gender differences in environmental attitudes and behavior, but it is unsure how this would specifically translate into political actions among female politicians. As elected members of the national parliament, these politicians have political power to influence the legislation process.

Recent empirical research has demonstrated an ambition to further develop measurements for legislative products. Some choose to structure their analysis around dimensions such as policy style, agenda and outcomes, while others choose dimensions such as legislative voting, parliamentary roles and ideological values. (Wängnerud, 2009). The focus here will be on the outputs and outcomes of environmental legislation and for this, two indicators have been selected for the analysis; climate laws and environmental agreements. The third variable will refer more to the environmental outcomes, measuring each country's greenhouse gas emission.

3.3.1 Climate Laws

The first variable, climate laws, are here defined as the number of active climate change legislations per year and country. The dataset was put together by Julia Runeson (2019) and then revised by me, containing climate change laws for the 34 European countries in this analysis during a time period of 1990-2018. The data on climate laws is commissioned by the Grantham research institute. The database includes legislations that clearly relate to climate change and the reduction of energy demands such as sustainable transportation, the promotion of low carbon energy supply, adaptation to climate change or the tackling of deforestation. Other laws and regulations are not included unless they are explicitly climate change related. However, it should be noted that The Climate change laws of the world database does not present the impact of each climate law, only the number of implemented laws (Runeson, 2019).

The dataset on the dependent variables actually stretches from 1974 since many of the most progressive countries had already implemented climate laws and joined environmental agreements around this time. However, since the dataset for the time series on women in parliament is limited to 1990 and onward, I have chosen to use the cumulative variable, counting climate laws and environmental agreements already in place at that time. The reason for this is that if we only count those in place after 1990, it might show a false correlation where the least progressive countries, who have implemented more laws or ratified environmental agreements in a later time, to be performing better, when that is actually not the case. The history of progressive countries outside the time-series scale needs to be taken into account.

3.3.2 Environmental Agreements

Indications that are consistent with the previous expectation derived from theories of gender and the state, also show that societies with greater representation of women in parliament are more prone to ratify environmental treaties. As a second dependent variable, I have therefore chosen the participation and ratification of international environmental agreements. As Norgaard &York (2005) points out, this is a widely accepted approach when looking at state environmentalism in a data analysis, offering a broad approach to multiple environmental problems at the same time. United Nations Statistic Division's database (2010) provides a list (see table 2 and 3 in the appendix for full list), where they present the years of formalization of participation in a selection of international environmental treaties and conventions for the total of the 192 United Nations member states. Their source for the data is in turn the United Nations Environment Programme Global Environment Outlook Data Portal (GEO Data). Participation is referred to; as when the country or area has become a party to the agreements under the treaty or convention. Countries who have signed but not become party to the agreements under a given convention or treaty are thus indicated as non-participants.

3.3.3 Greenhouse gas emissions

While the climate laws and environmental agreements, as mentioned previously, are legislative outputs, greenhouse gas emissions can be seen as the environmental outcome of these outputs. Dietz et al. (2015) found in their study of the political influences on greenhouse gas emissions, that demographic and economic forces could in part be offset by politics supportive of the environment, level of emissions over time was found to be lower in states that elect legislators with strong environmental records. Ergas & York (2012) show similar results in their quantitative analysis of cross-national data, finding that CO_2 emissions per capita are lower in nations where women have higher political status, controlling for GDP per capita and level of democracy. The data for this variable is collected from World Resources Institute, which uses time-series data on the total emissions of the six major greenhouse gases. such as carbon dioxide and methane, made available by the Climate Watch (2019). A dataset then had to be made for this sample of countries, measuring total emissions per capita as metric ton equivalent to CO^2 between the years 1990–2016. Using 1990's years level is a good fit since, while the global trend is that for example CO^2-emission to be constantly on the rise, there are some countries that have managed to curb their emission and have started to see a decline. But for many cases, that development did not appear until the 1990's and it is also often used as benchmark year in many climate goal propopals.

The correlation analysis on the number of women in the parliament and the three dependent variables shows us in the correlation matrix below (see table 1), how the variables relates to each other. Here, we can see that the share of women in parliaments is positively associated with more climate change legislation (0,4320) and more environmental agreements (0.5013), which was expected according to my hypothesis. The latter two also correlate positively with each other (0.5084), countries who sign environmental agreements also tend to implement more climate laws. More women in the parliament was surprisingly positively associated with increasing levels of greenhouse gas emission (0.1678), however, the number is fairly low. While climate laws (-0,1021) and environmental agreements (-0.0230) to the contrary, seem to have a negative, but not very strong impact on the relationship to greenhouse gas emissions. Which seems logical, the intention of laws and agreements is to have a positive impact on the environment and is in line with the expectations of this analysis. It is also worth mentioning that the correlation analysis does not tell the causality, meaning what comes first.

Table 1 : *Correlation matrix*

	(women)	(climate_laws)	(enviro_agreement)	(ghg_emissions)
Women in parliament	1.0000			
Climate change legislation	0.4320	1.0000		
Environmental agreements	0.5013	0.5084	1.0000	
Greenhouse gas emissions	0.1678	-0.1021	-0.0230	1.0000

3.4 Control variables

The use of control variables is important when doing a statistical analysis. By including control variables in the multiple regression analysis, we can discover the impact of alternative explanations to the examined relationship in our empirical research (Schjoedt & Sangboon, 2015). Measuring the effect of the control variables will estimate the strength of the said relationship between the proportion of women in the parliament and the environmental outcomes and determine if it is spurious, meaning that the control variable itself might be causing the suggested positive effect on environmental outcomes, rather than the proportion of women in the parliament. What are the factors that can contribute to the development of state environmentalism, meaning the states support for environmental protection? One alternative that has not yet been suggested here, is the development of an ecological rationality as a part of modernization and growing prosperity (Norgaard & York, 2005. p.506).

Research has, for example, shown that women's representation in the UN climate change negotiations is higher in countries that enjoy a higher degree of political gender equality and higher level of *development* (Kruse, 2011). When studying the effects of women's descriptive and substantive presentation on gender equality outcomes, Sundell & Wängnerud (2011, s.99, 101) explained that for some dimensions of gender equality, the driving forces might be ascribed to general transformation in the society rather than the share of women in parliaments. They point to the theory of Inglehart & Norris, who conclude that modernization underpins cultural change in a slow process rather than as a result from direct intervention by politicians.

However, there is important critique against this theory for failing to capture the short-term changes. While there are indications from research showing that modernization and development generally lead to a greater support for example environmental treaties, it should be interpreted with in mind, that there is also strong evidence on modernization and development leading to an escalation of environmental degradation (Norgaard & York p.512).

3.4.1 Economic development

Economic development is especially an important part in modernization, and it is of further interest that it seems to be able to affect the environment both for the better and for the worse. The quantitative literature examining the human driving forces of environmental stress is consistent in the finding that, within units such as nation-states, the level of prosperity, which is usually measured as GDP per capita (gross domestic products), is one of the dominant influences. The impact of the scale of economic activity, and especially economic growth, could improve the environment depending on how it is being used (Dietz et al. 2015). For example, investing in green technologies could enable countries to clean up their emissions. For many pollutants, this relationship has been depicted by the hypothetical environmental Kuznets curve. The inverted U-shaped curve shows the early stages of a country's economic growth, environmental impacts where pollution increase, but beyond some level of GDP per capita economic growth leads to environmental improvement and pollution decreases (Stern, 2018). On the other hand, while with more purchasing power, consumption pattern may instead increase, which in turn is putting more pressure on the environmental resources. The data for all control variables has been collected from The Quality of Government Institute's database. The variable for economic development here, uses data from The Maddison Project Database and is measured as Real GDP per capita, meaning that it is adjusted for inflation. This is the most useful when applying time-series data, in order to be able to compare the actual development of the economic activity historically. (Teorell et al 2019: Bolt et al, 2018).

3.4.2 Level of democracy

Democracy is often used as an indicator of modernization and most developed countries are democracies with a few exceptions. In a survey study made by Welzel, Norris & Inglehart (2002), evidence was found to support their conclusion that the process of modernization drives a cultural change which encourage both the rise of women and the development of democracy. There is also strong evidence that democracies, for example, sign and ratify more environmental agreements and participate in more environmental intergovernmental organizations (Neumayer, 2002). However, scholars have debated the effect of democracy on the environment. Some have argued that democracy reduces environmental degradation, while others argue that it may even harm the environment and the empirical evidence has thus been divided (Li & Reuveny, 2006).

Regardless of the suggested positive or negative effect that democracy might have on the environment, it is indeed an important control variable to include as an indicator of development and modernization within a country, adding to the facts its ability to promote gender equality. The variable for level of democracy uses data from Freedom House. Their scale ranges from 0-10 where 0 is least democratic and 10 most democratic (Teorell et al 2019: Freedom House, 2018). Most of the countries included in the analysis are nowadays viewed as democracies, however their range of democracy varies and have varied substantially over time, making it of further interest to analyze in a cross-sectional and time-series research.

3.4.3 Corruption

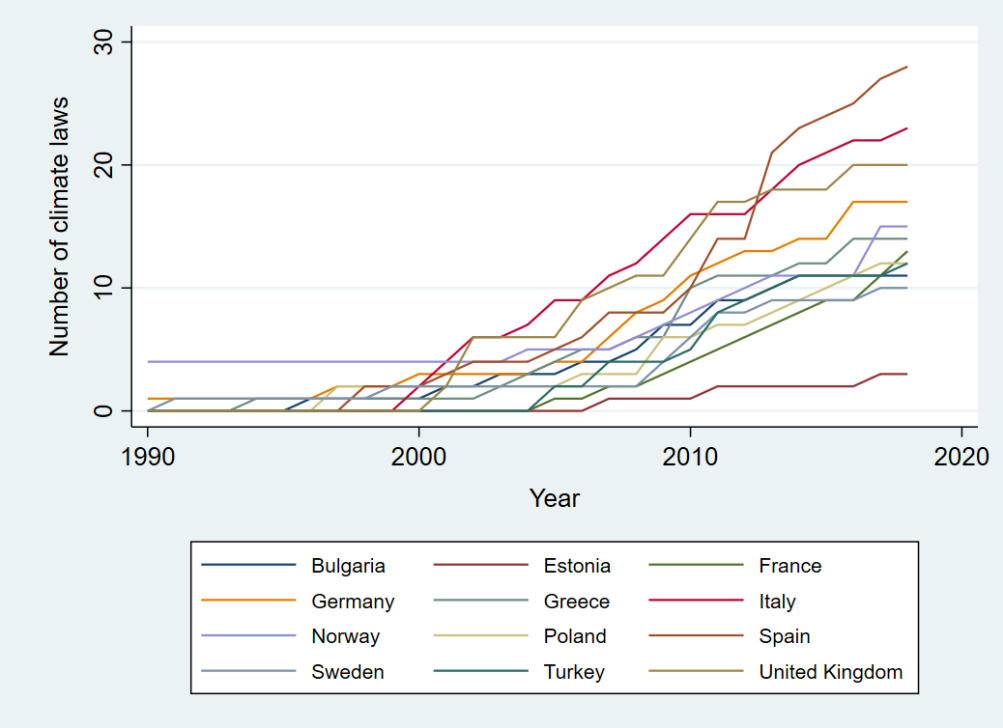
While democratic countries have been argued to perform better, in regard to environment problems, such as participating in international environmental treaties, adopting stricter environmental policies, and curbing their emissions, there is a large variance in performance. Research indicate that for example CO^2 - emissions, more democracy is only associated with low-corruption contexts (Povitkina, 2018. p.411) Studies on corruption done by researchers at the World Bank also found evidence of a negative correlation between the number of women in parliament and the level of corruption. The higher the number of women in the national parliament of a country, the lower the level of corruption (Wängnerud, 2009. p.58) However, the causal direction of the relationship is not clear, it might be the opposite mechanism, a lower level of corruption enables a system that allows a higher number of women to be elected to the parliament. Nonetheless, this makes the indicator more interesting to be included in the analysis. The variable legislature corrupt activities are used to capture how the members involved in the legislation process abuse their power. (Coppedge et al, 2017: Pemstein et al, 2010).

3.5 Dummy variables

As mentioned previously in the beginning of this chapter, it is a likely that the number of climate laws, agreements and level of emissions improve and vary over time and between countries.

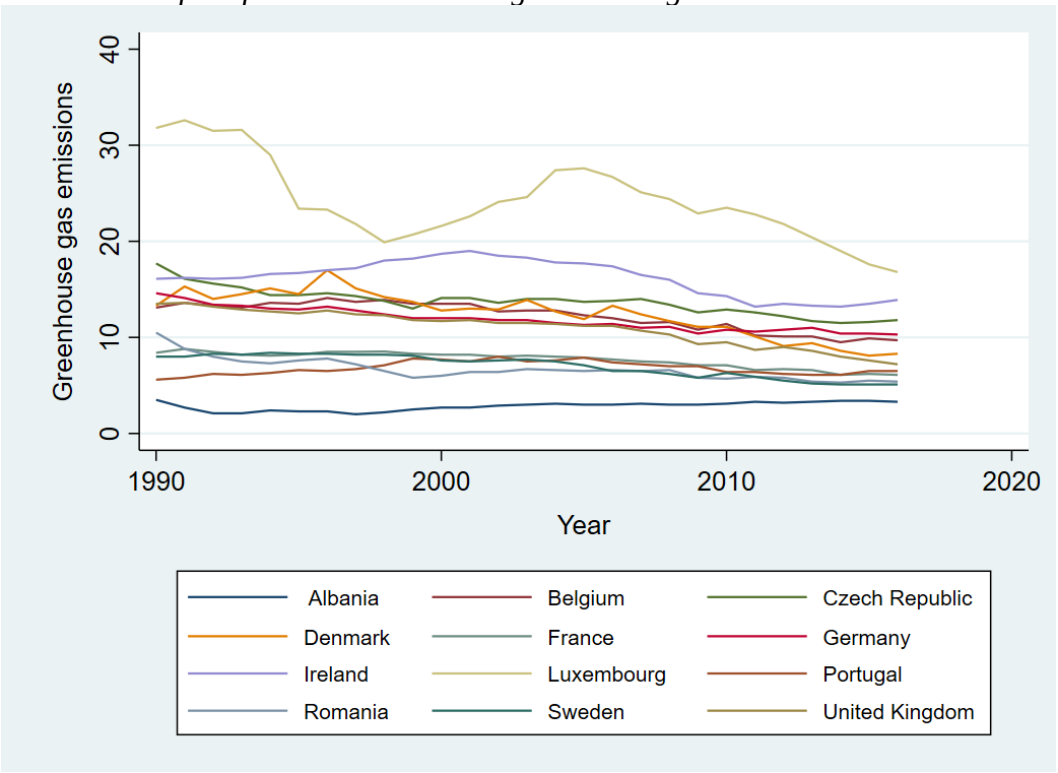
It can be seen, for example, in the line chart below (see chart 1) that there is a substantial variance in the development of the number of climate laws among the European countries in the last three decades. Few countries hade implemented any climate laws in the year 2000 but after entering the 21:st century there is a sharp and rapid increase in the number of laws implemented. The development seems to be steady over time for all of the countries included, with Spain coming in first, together with other progressive countries such as Italy and the U.K.

Chart 1: *Sample of countries and the number of active climate laws*



When looking at the development of the levels of greenhouse gas emission over time in the line chart below (see chart 2), we see that emissions seem to have decreased steadily but relatively small over time for the majority of the countries. Measuring emission as metric ton per capita gives a relatively 'low' number, making it somewhat hard to distinguish any larger indifferences, but the fact is that some European countries have emissions that are not far from the global average. In 2017, the emissions in France were 5.5t per person and 5.8t in the United Kingdom. This is at the same level as 'poorer' countries such as Romania and half of the emissions level from neighbor countries with similar standards of living, such as Germany, the Netherlands and Belgium (Climate Watch, 2019).

Chart 2: *Sample of countries and their greenhouse gas emissions*



We now see a pattern where climate laws and environmental agreements increases, and emissions decreases slowly, but steadily over time. These patterns might be part of a larger trend that is coinciding with the improvement of gender equality, such as more women in the national parliaments. By including a dummy variable for each year of the analysis in the regression analysis, I will be controlling for these suggested trends over time. The same will be done by using a dummy variable for each country, taking into account a large amount of the properties that are typical for the country, such as religious or cultural characteristics. For example, progressive countries like Sweden that perform well in many aspects, such as gender equality, human rights and democracy and so on, might exhibit a typical 'Sweden-effect' that is part of a larger trend within the country. Controlling for this will provide a tougher test to the hypothesis and the relationship between proportion of women in the parliament and all of the three dependent variables. When doing so we can single out the suggested, positive effect on the environmental outcomes by the number of women inte parliament from these larger trends. If the relationship would persist and still be significant after this test, it will make a very strong case for my hypothesis These dummy variables are atheoretical in nature, meaning that they are not based on theory. This also means that it be might difficult to clarify why any given effect on the relationship of number of women in the parliament and environmental outcomes caused by these control variables occurs since they consist of so many factors.

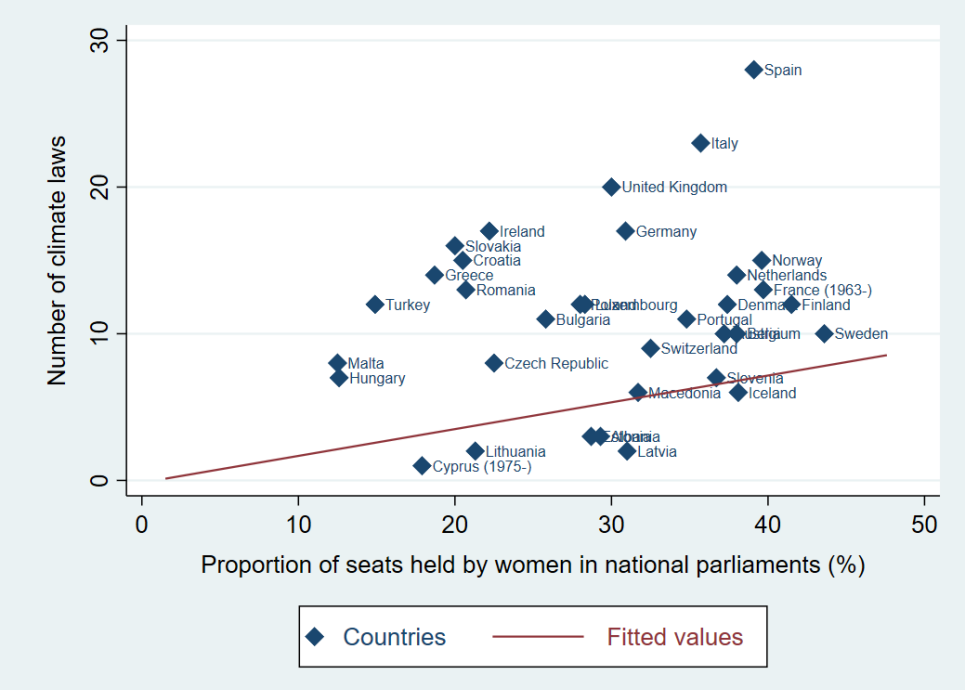
4. Results

In the previous section, the correlation matrix and the linear graphs showed an initial result of a positive impact from a higher number of women in the parliament and an improvement in environmental outputs and outcomes. In this section, we will take a further look at the effect of the number of women on each of the three dependent variables separately, by first analyzing graphs and scatterplots. These are useful tools to help us understand the distribution of these variables between countries. Following this, in each section, the major analysis of the multiple regression analysis done will be presented for each of the three dependent variables. The analysis will be able to tell us the co-variance of our variables and how much of that variance that can be explained by our models., The regression analysis will also be able to tell us if the researched relationship has any statistical significance or if it is spurious.

4.1 Regression analysis: Climate laws

When looking at the graph for the number of climate laws and the proportion of seats held by women in the parliament, the number of laws indeed correlates strongly with the number of women increasing, however with a surprisingly drop somewhere around after the 40 percent mark. (see graph 1 in the appendix.) While looking at the scatterplot below (see chart 3), we can also see that the countries with the highest number of climate laws also seem to be fairly ahead in regards of number of women.

Chart 3: *Active climate laws in 2018.*



The distribution of the best performers with regards to the number of climate laws can be found in Spain, Italy and United Kingdom, while the northern countries together with countries like France and the Netherlands have the largest proportion of women in their parliaments. Lagging, in regard to the number of women in the parliament, are countries from southern Europe and the former Soviet bloc. However, note that countries like Turkey, having less than 20 percent of women in the parliament, have implemented more climate laws than for example Sweden.

To be able to conclude if more women in the national parliament indeed has improved the environmental outputs by implementing more climate laws, a regression analysis was done (see table 2 below). The results of Model 1 give us a positive correlation between the number of women in the parliament and the number of climate laws. While being statistically significant, the number (0.183) tells us that for each one percent of seats that women attain in the parliament, the number of climate laws increases by circa 0,2. There would need to be an increase of at least 5 percent in the share of seats held by women, for one new climate law to be implemented.

Table 2: *Regression analysis of women's political representation on climate change legislation*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Women in parliament	0.183***	0.248***	0.180***	0.0982***	0.183***	0.0791***	0.0218
	(0.0123)	(0.0154)	(0.0142)	(0.0140)	(0.0141)	(0.0125)	(0.0192)
Legislature corruption		-1.704***			-3.273***	-1.401***	-1.916***
		(0.207)			(0.224)	(0.212)	(0.419)
Level of democracy			-0.00377		0.155	0.179	0.0264
			(0.154)		(0.147)	(0.116)	(0.138)
GDP per capita (thousands of dollars)				0.0781***	0.173***	0.0878***	-0.0295
				(0.0114)	(0.0125)	(0.0110)	(0.0206)
Dummy – year	No	No	No	No	No	Yes	Yes
Dummy – country	No	No	No	No	No	No	Yes
Intercept	-0.154	2.756***	-0.156	-0.935**	2.009	-0.447	-2.654*
	(0.296)	(0.452)	(1.351)	(0.301)	(1.197)	(1.122)	(1.223)
N	968	895	867	889	835	835	835
R^2	0.187	0.229	0.187	0.209	0.384	0.636	0.796

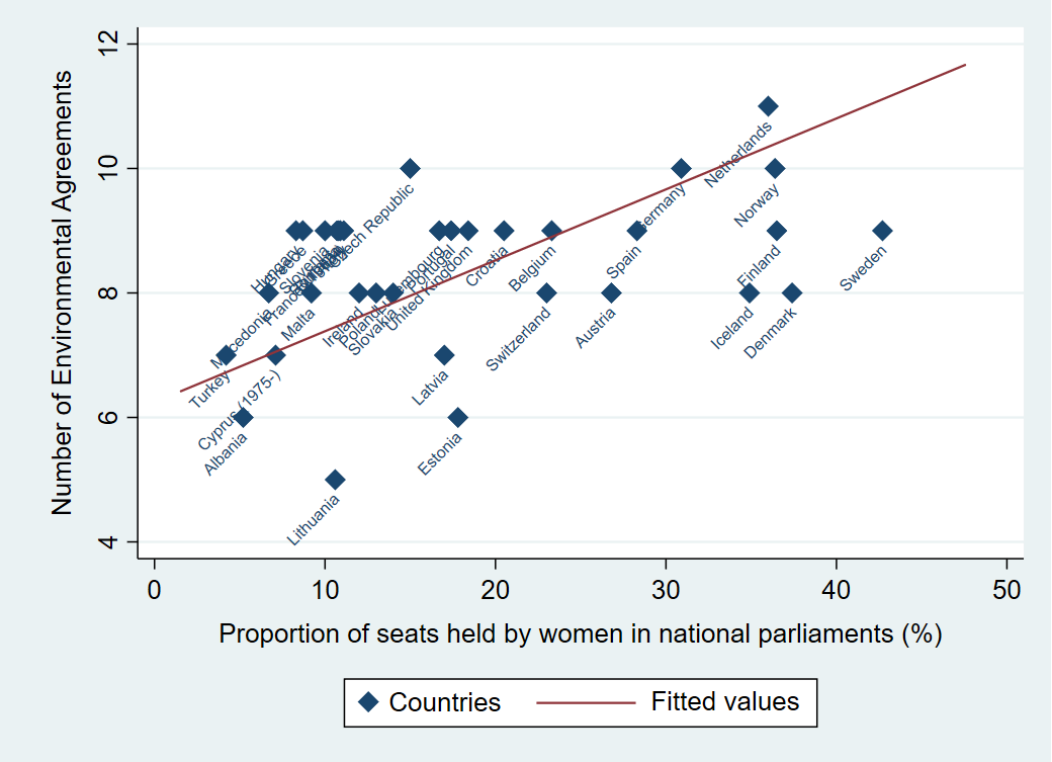
When adding the control variables of corruption, the strength of the effect of more women in the parliament increases, while after introducing control variables of level of democracy and GDP per capita in model 3 and 4, this effect weakens, shows significance. When all variables are run together in the fifth model, the effect increases again and is back at the same level as in the first model. Both corruption and GDP per capita also show significance. The same relationship persists when a year dummy-variable is added in the sixth model. The strength of the effect from the number of women in the parliament on climate change laws is significant but weakens down to (0,0791), meaning that there would need to be an increase of at least 12 percent in the proportion of women in the national parliament to attain one new climate law.

Nonetheless, since the effect of women is still significant, it shows us that the hypothesis passed the robust test for yearly trends. The R^2-value also tells us that a much larger variance can be explained in this model, which means that there is a high probability that the relationship of the data in the regression analysis is true to the actual conditions out in the real world. In the final model, the country dummy-variable is added and the effect on climate change legislation from an increase in the number of women in the parliament is no longer significant. Only the variable corruption strengthens and remains significant, which is in line with previous research that the presence or absence of corruption can be an important factor in environmental politics. A much larger variance is also explained by this model, around 80 percent. However, it is worth remembering that while my hypothesis did not pass in the last model, it is unclear what the 'country-effect' of the dummy-variable mean for the main relationship of the analysis.

4.2 Regression analysis: Environmental agreements

The initial result from the correlation matrix gave us a positive correlation between a larger proportion of women in the parliament and more environmental agreements. Many of the environmental agreements were established and joined by several countries already in the 1970's, thus countries who did not exist at the time were of course not able to be a party under the agreement until their origin or were previously a party under a different entity. This has led to many "new" countries catching up on more progressive countries quite fast. Today, a large majority of the countries are parties under all eleven of the environmental agreements. Although, when looking at the scatter plot below (see chart 4), we can see that in the year 2000 there was still a substantial variance in the number of joined environmental agreements.

Chart 4: *Environmental Agreements in the year 2000.*



This time around, we see a similar pattern as in the previous section. The progressive northern countries, together with countries like Netherlands, Germany and Spain, seem to be in the front of joining environmental agreements. Lacking behind are countries from the former Soviet bloc, together with other south-east countries such as Turkey, Albania and Cyprus, the latter who also have a very low number of women in the parliament. For a full list of the date of the joined agreements for the countries in the analysis, see table 3 in the appendix.

The regression analysis of the relationship between the number of women in the parliament and the number of environmental agreements joined by a country shows that there is a positive correlation (see table 3 below). The strength seems to be similar to in the previous section, while statistically significant, an increase by eight percent in the proportion of seats held by women in the parliament is needed to yield an additional environmental agreement.

Table 3: *Regression analysis of women's political representation on environmental agreements*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Women in parliament	0.114***	0.150***	0.180***	0.0717***	0.117***	0.0418***	0.0274***
	(0.00633)	(0.00796)	(0.0142)	(0.00781)	(0.00720)	(0.00489)	(0.00766)
Legislature corruption		-0.966***			-2.169***	-0.561***	0.642***
		(0.107)			(0.114)	(0.0828)	(0.168)
Level of democracy			-0.00377		0.656***	0.481***	0.260***
			(0.154)		(0.0748)	(0.0455)	(0.0551)
GDP per capita (thousands of dollars)				0.0470***	0.0920***	0.0275***	-0.0171*
				(0.00634)	(0.00640)	(0.00431)	(0.00825)
Dummy – year	No	No	No	No	No	Yes	Yes
Dummy – country	No	No	No	No	No	No	Yes
Intercept	6.245***	8.074***	-0.156	5.868***	3.317***	0.0301	0.334
	(0.153)	(0.233)	(1.351)	(0.168)	(0.611)	(0.439)	(0.489)
N	968	895	867	889	835	835	835
R^2	0.251	0.293	0.187	0.275	0.513	0.831	0.901

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

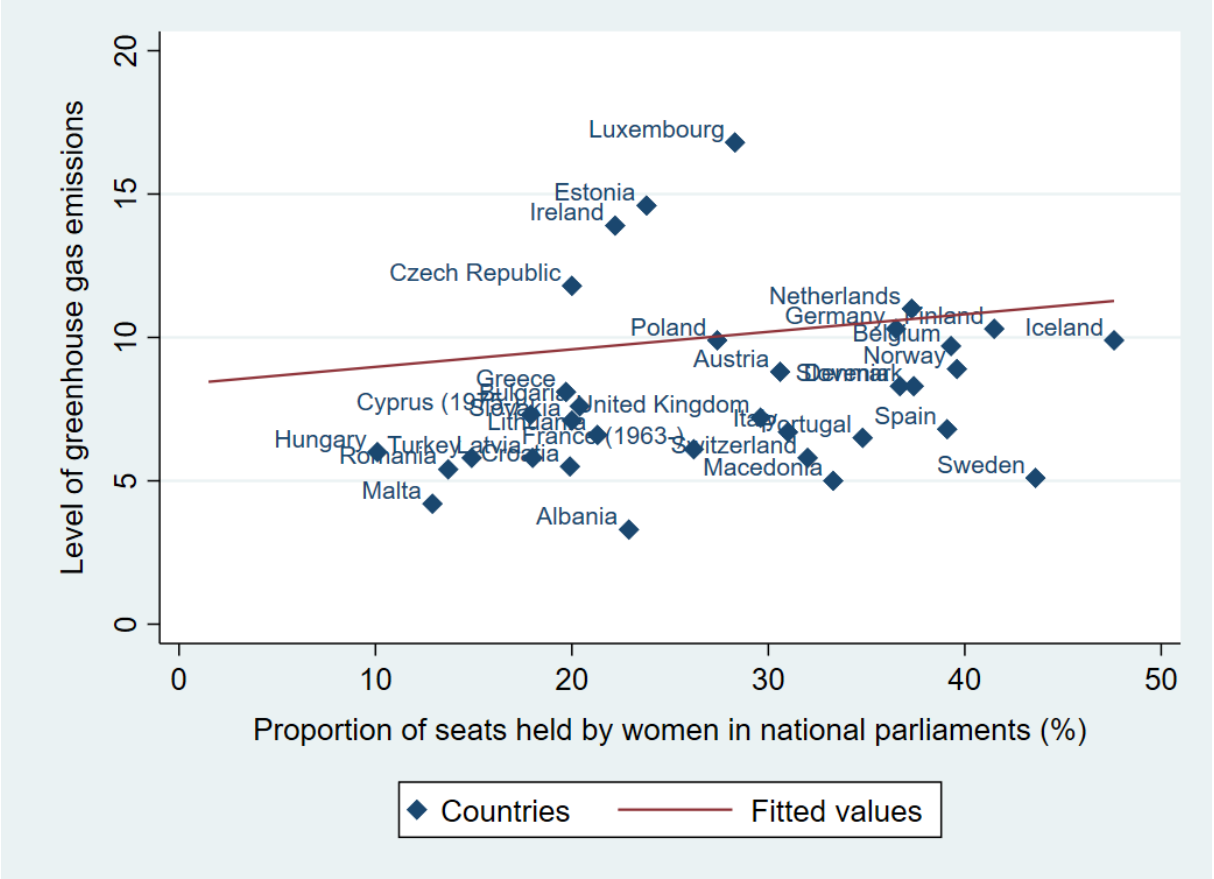
When controlling for corruption, level of democracy and economic development, once again, the effect of the number of women first strengthens but then weakens down to (0.0717) while remaining statistically significant. As before, running all variables in the multivariate analysis strengthens the effect of the number of women and all variables showing significance. In the sixth and last model, when the year and country dummy-variable is introduced, the effect of the number of women in the parliament on joining environmental agreements remains significant and the hypothesis passes the tougher test, however the effect is too low to yield any substantial effect on environmental agreements. About 90 percent of the variance is also explained by the last model. Legislature corruption activities and the level of democracy is also shown to be significant and of importance for joining environmental agreements.

4.3 Regression analysis: Greenhouse gas emissions

In this final section, the effect of the proportion of women in the parliament on the level of greenhouse gas emissions is reviewed. We already know that the number of women surprisingly had a weak but positive correlation with greenhouse gas emissions, meaning that when the number of women increase, the emissions also go up. The same pattern can be viewed in the graph on the relationship between the number of women and emissions (see graph 3 in appendix). However, the relationship seems to be S-shaped, with a decline starting at around 15 percent of the seats held by women, only to rise again around 30 percent but then quickly sees a substantial drop in emissions when women reach 40 percent of the seats in the parliament.

In the chart below, we see somewhat of the same pattern as in the two previous sections. While the variance in emissions is not as drastic, we still see the same group of countries at the frontline. Countries like Spain and Sweden manage to have the same level of greenhouse gas emissions as less developed countries like Romania and Turkey. However, the fitted line here shows a positive relationship of higher emission associated with a higher number of women.

Chart 4: *Greenhouse gas emissions in the year 2016.*



In the regression analysis run on the relationship between the proportion of seats held by women in the parliament and emissions of greenhouse gas, we can see a weak, but positive correlation in the first model. For each percent of seats that women attain the parliament, emissions go up by 0.06 metric tons. When all control variables are included, the effect of more women in the parliament is reversed, decreasing greenhouse gas emission by 0.13 metric ton while being stastically significant. When the year dummy-variable is added in the sixth model, all variables remain significant and the increase in the proportion of seats held by women in the parliament by 10 percent decreases greenhouse gas emissions by 1 metric ton per capita. That is quite a lot since some of the countries, as mentioned before, have levels of 5 metric ton per capita.

Table 4: *Regression analysis of women's political representation on greenhouse gas emissions*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Women in parliament	0.0611***	-0.115***	-0.0123	-0.0520***	-0.137***	-0.100***	0.00584
	(0.0121)	(0.0133)	(0.0136)	(0.0135)	(0.0139)	(0.0156)	(0.0104)
Legislature corruption		3.593***			2.762***	2.043***	0.740**
		(0.178)			(0.220)	(0.265)	(0.236)
Level of democracy			1.705***		0.536***	0.532***	-0.0159
			(0.156)		(0.152)	(0.153)	(0.0797)
GDP per capita				0.156***	0.0570***	0.0895***	-0.0225*
				(0.0110)	(0.0124)	(0.0138)	(0.0112)
Dummy – year	No	No	No	No	No	Yes	Yes
Dummy – country	No	No	No	No	No	No	Yes
Intercept	8.362***	2.592***	-6.147***	6.475***	-1.330	-0.0939	3.596***
	(0.288)	(0.388)	(1.378)	(0.294)	(1.246)	(1.469)	(0.706)
N	884	852	825	879	825	825	825
R^2	0.028	0.338	0.144	0.210	0.368	0.396	0.936

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Unfortunately, in the last model, when the country dummy-variables is added, we can see that the effect of the number of women weakens substantially and is no longer significant. Only legislature corruption remains significant, just like with the first regression analysis, A very large part of the variance is once again explained by our last model. While members of the parliaments indeed have political power to influence a country's greenhouse gas emissions, they are not the sole actor and measuring emissions and what is having an impact is complex.

5. Discussion

The regression analysis showed some mixed results. The effect of the number of women in the parliament showed statistical significance on all three dependent variables; implementing climate laws, joining environmental agreements and lowering greenhouse gas emissions. These main relationships persisted when controlling for legislature corruption, level of democracy, economic development and the hypothesis passed the test of the year dummy-variable. In the case of greenhouse gas emissions, the effect of the number of women on emissions level were even relatively large. This also means that our main relationship cannot be explained by yearly trends coinciding with an increase of the number of women in the parliament. Although, all of the control variables also showed significance which would be in line with the modernization theory. When adding the country dummy-variable into the regression analysis, only environmental agreements still showed significance, while the effect might be deemed too low to yield any real consequences of women's political presence. Corruption remained significant in all three cases, suggesting it to be an important factor in environmental politics.

What does it say that the apparent effect of women's political presence disappeared when controlling for country dummies? As we saw previously, some countries repeatedly stood out as top performers on environmental outputs while also having more women in their parliaments. The purpose of the country dummies is to capture these kinds of characteristics. Take Sweden as an example, a top performer when it comes to gender equality, the environment, democracy and corruption. The analysis would measure a typical country-effect of Sweden where joint factors promotes good environmental politics. It does not say that we know for certain that gender equality did not play a role in promoting environmentalism in Sweden, while my hypothesis did not find the required support in the analysis to say for sure that there *is* an effect of women's political presence on environmental outputs except for environmental agreements.

Furthermore, the indicators chosen in this analysis might not be able to capture the effect of more women in national parliaments on environmental outcomes might. An alternative is to do a larger study and use a wider range of indicators in a cross-section analysis and include more control variables in order to isolate the effects of gender (Wängnerud, 2012. p.61). While research show gender differences in environment concern in attitude among members if the parliament, there is a lack of research on which environmental issues are prioritized by female politicians and how and if they intend to translate their concern into political actions.

The empirical research presented early on in this thesis was consistent in showing that men and women care different for the environment, while having different arguments for why these differences exist. Some research even showed gender differences on a national level, there were differences in environmental concern and attitudes among the members of national parliaments as well as in the European parliament. Why do the results not demonstrate this expected effect? One counterhypothesis is that, ideology is what matters in politics. How politicians position themselves ideologically has previously been shown to be of importance when it comes to environmental attitudes. According to the social identity theory mentioned earlier, ideology is one of the characteristics and beliefs that might be as crucial to political behavior as gender. To control for ideology in this analysis was not possible due to lack of suitable data but it could be of interest to include in further studies.

Another argument is that social characteristics such as class or ethnicity are more decisive than gender. A critique against the rational argument about political representation has been made by Celis, Childs, Kantola & Krook (2008, s.99) who warn that: ”*focusing on female representatives ignores important differences among women*”. Other scholars such as Dankelman (2002, p.21) have also argued that it is “*incorrect to talk about women as one homogeneous group*”, because of the vast economic, cultural, and social differences between women. Class, age, nationality are also important separating variables when looking at any group in the society. Analyzing these differences is as crucial as looking into the gender.

An additional important point to make is that parliamentary institutions might influence politicians more than politicians are able to influence them. It goes without saying that parliaments are complex institutions and women entering parliament become just like the male politicians, acting more like politicians than women. Therefore, it is a methodological challenge to empirically test the theory of the politics of presence, if women really do represent the interest of women as group and pursue it in their politics (Wängnerud 2012, p.148). This would explain the result from the analysis done here, politicians might pursue a better environment, not because of their specific gender, as according to the essentialist and rational argument, but because it is an overall important issue. Women who become members of the parliament might also not pursue environmental issues at first, because they find other political issues to be of more importance . Their concern for the environment might still be there, but it is not on top of their list.

Some might argue that political inclusion of women might foremost be symbolic, and that the most difficult obstacle is the deeply embedded culture of masculinity in political institutions. The question would then instead be if women are able to make an impact, once the become a member of the parliament. Regarding critical mass, others have criticized this concept as being too mechanical and implying immediate change at a certain level, we might have just started to see the effects of the increasing number of women in politics (Wängnerud, 2009. p.60).

In s study made by Chang, Pong & Tam (2017, p.81) they found that: "*gender differences in environmental concern were smaller in societies with higher levels of for example gender inequality and economic scarcity*". They stressed the need to examine more further questions of 'why' and 'when' gender differences in environmental concern emerges and the importance of examining variables not only on an individual-level but also on societal-level factors. This brings into light the importance of other factors overshadowing the gender equality effect. Countries who have better environmental politics and parliaments where women have large proportion of seats in the parliament, are often those considered to be most 'modern'. In line with the modernization theory, striving for better environmental outcomes and prioritizing having as much women as men in the parliament might both be symptoms of modernization. This would partially explain why all of the control variables also showed to be significant.

6. Conclusions

Finally, the conclusion here is that my analysis did not find enough support for the hypothesis, that when the number of women in parliaments in European countries increase, environmental outputs and outcomes improves. Only the case of joining environmental agreements showed significance after controlling for all variables with a relatively low effect in the end. It can also be concluded while research found consistent gender differences in environmental attitudes and behavior it is unsure if they play an important role in the political arena. Even so, it is empirically hard to capture the effect that more women in the parliament could have on environmental outputs and outcomes, when there is a lack of research on how female politician prioritize and pursue environmental issues. A good suggestion made by Wängnerud, (2012. p.61) is to do other studies, like case studies, to explore causal mechanisms in more detail and by doing so connect research on the causes of the increased number of women elected and research on the effects of that change. Another, but more difficult alternative, is using a longitudinal design; we should follow what happens "from the start" when women are few in numbers and follow the development as their political presence increases.

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8. Appendix

Table 1: *List of sample countries and years under study*

Country	Years under study	Country	Years under study
Albania	1999-2018	Latvia	1990-2018
Austria	1990-2018	Lithuania	1990-2018
Belgium	1990-2018	Luxembourg	1990-2018
Bulgaria	1990-2018	Malta	1990-2018
Croatia	1992-2018	Macedonia	1990-2018
Cyprus	1990-2018	Netherlands	1990-2018
Czech Republic	1993-2018	Norway	1990-2018
Denmark	1990-2018	Poland	1990-2018
Estonia	1990-2018	Portugal	1990-2018
Finland	1990-2018	Romania	1990-2018
France	1990-2018	Slovakia	1992-2018
Germany	1990-2018	Slovenia	1992-2018
Greece	1990-2018	Spain	1990-2018
Hungary	1990-2018	Sweden	1990-2018
Iceland	1990-2018	Switzerland	1990-2018
Ireland	1990-2018	Turkey	1990-2018
Italy	1990-2018	United Kingdom	1990-2018

Table 2: *List of Environmental Agreements*

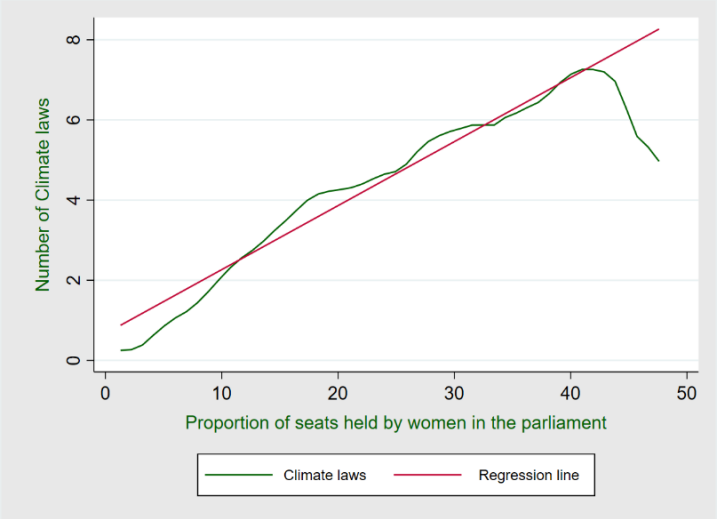
	Environmental Agreements	Type
1.	Basel Convention	Hazardous waste and disposal
2	Convention on Biological Diversity	Biological diversity
3	CITES	Trade with Endangered species
4	Convention on Migratory Species	Wild animals
5.	World Heritage Convention	Protection of cultural heritage
6.	Montreal Protocol	Ozone layer
7.	Ramsar Convention	Protection of Wetlands
8.	Rotterdam Convention	Hazardous chemicals and pesticides
9.	Stockholm Convention	Persistent Organic Pollutants
10.	UN Convention: Combat Desertification	Drought and desertification
11.	UN Convention on the Law of the Sea	Maritime jurisdiction

Table 4: *List of year when country became party under an environmental agreement.*

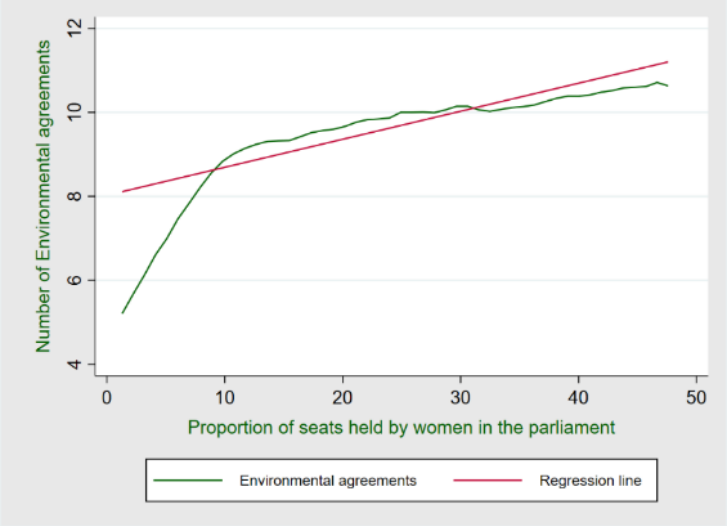
Country	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Albania	1999	1994	2003	2001	1989	1999	1996	-	2004	2000	2003
Austria	1993	1994	1982	2005	1992	1989	1983	2001	2002	1997	1995
Belgium	1993	1996	1983	1990	1996	1988	1986	2001	2006	1997	1998
Bulgaria	1996	1996	1991	1999	1974	1990	1976	1999	-	2001	1996
Croatia	1994	1996	2000	2000	1992	1991	1992	2006	2007	2000	1995
Cyprus	1992	1996	1974	2001	1975	1992	2001	2003	2005	2000	1988
Czech Rep.	1993	1993	1993	1994	1993	1993	1993	1999	2002	2000	1996
Denmark	1994	1993	1977	1983	1979	1988	1978	2003	-	1995	2004
Estonia	1992	1994	1992	2008	1995	1996	1994	2005	-	-	2005
Finland	1991	1994	1976	1989	1987	1988	1975	2003	2002	1995	1996
France	1991	1994	1978	1990	1975	1988	1986	2003	2004	1997	1996
Germany	1995	1993	1976	1984	1976	1988	1976	2000	2002	1996	1994
Greece	1992	1992	1994	1999	1981	1988	1975	2002	2006	1997	1995
Hungary	1990	1994	1985	1983	1985	1989	1979	1999	-	1999	2002
Iceland	1995	1994	2000	-	1995	1989	1978	-	2002	1997	1985
Ireland	1994	1996	2002	1983	1991	1988	1985	2004	-	1997	1996
Italy	1994	1994	1979	1983	1978	1988	1977	2001	-	1997	1995
Latvia	1992	1995	1997	1999	1995	1995	1995	2002	2004	2002	2004
Lithuania	1999	1996	2001	2002	1992	1995	1993	2003	-	2003	2003
Luxembourg	1994	1994	1983	1983	1919	1988	1998	2001	2003	1997	2000
Macedonia	2000	1997	2000	1999	9483	1994	1991	-	2002	2004	1994
Malta	2000	2000	1989	2001	1997	1988	1989	-	-	1998	1993
Netherlands	1993	1994	1984	1983	1978	1988	1980	1999	2002	1995	1996
Norway	1990	1993	1976	1985	1992	1988	1975	2000	2002	1996	1996
Poland	1992	1996	1989	1996	1977	1990	1978	2004	-	2001	1998
Portugal	1994	1993	1989	1983	1980	1988	1981	2004	2004	1996	1997
Romania	1991	1994	1994	1998	1990	1993	1991	2002	2004	1998	1996
Slovakia	1992	1994	1993	1995	1993	1993	1993	2006	2002	2002	1996
Slovenia	1992	1996	2000	1999	1992	1992	1991	1998	2004	2001	1995
Spain	1994	1993	1986	1985	1982	1988	1982	2003	2004	1996	1997
Sweden	1991	1993	1974	1983	1985	1988	1975	2002	2002	1995	1996
Switzerland	1990	1994	1974	1995	1975	1988	1976	2001	2003	1996	2009
Turkey	1994	1997	1996	-	1983	1991	1994	-	-	1998	-
United King.	1994	1994	1976	1985	1984	1988	1976	2003	2005	1996	1997

See previous table to check which number is representative for each agreement.

Graph 1: *Polygraph on the number of climate laws*



Graph 2: *Polygraph on the number of environmental agreements*



Graph 3: *Polygraph on greenhouse gas emissions*