Veto points and environmental policy stringency

A relationship conditional on the levels of corruption

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Abstract

The increasing instability of the environment on which we humans depend is a vital political concern, and environmental policies are tools for governments to regulate human impact on the natural world. To increase the stringency of these policies has been found to have positive effects on emission rates and air pollution. However, we do not have extensive knowledge on which political factors that lead to more stringent environmental policies. In this thesis I aim to examine a piece of this puzzle: whether these policies are influenced by the formation of veto points, and whether the influence of veto points is contingent on corruption levels.

I argue that the difficulties with policy-making that leads to more stringent policies grow as the number of veto points increases, and as their preferences deviate. Moreover, corruption is known to 'grease the wheels' for both anti-environmental interests and pro-environmental interests which can impact the adoption of policies. Additionally, corruption influences the implementation of environmental policies. I therefore argue that corruption can influence the relationship between the formation of veto points and environmental policy stringency. I test two hypotheses on cross-sectional time-series data with two-way fixed effects OLS regressions, and clustered standard errors. The results reveal little support for a direct relationship between veto points and environmental policy stringency. However, the results give strong support for a relationship conditional on corruption levels. With low corruption, the increase in political constraints is associated with an increase in the strictness of environmental policies. On the contrary, when corruption levels are high, the increase in political constraints is associated with a reduction in stringency. The findings in this thesis suggest that to understand how veto points can influence the strictness in environmental policies, it is essential to include the interplay with corruption.

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All faults and inaccuracies in this thesis are my own.

The R-script for the analysis can be found here:
`https://github.com/johannefurnes/mastersthesis`

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Chapter 1

Introduction

The degradation of the natural environment has become a vital concern in politics. Climate change and anthropogenic environmental changes will continue to cause biodiversity loss in the coming decades which threatens human survival (Stork, 2010). Species play essential roles in ecosystems, and great losses of species and environmental degradation threaten the stability of these ecosystems on which humans depend (McCann, 2000). An increasingly unstable environment calls for political action. This thesis seeks to better understand what shapes the policies that regulate environmentally harmful behaviour, namely more stringent environmental policies. What influences the decision-making processes leading to environmental policy adoption, and what affects the levels of cost that these policies impose on society?

More specifically, the thesis aims to investigate whether there is a connection between domestic political institutions and the strictness of environmental policies. Stricter environmental policies is found to reduce CO_2 and overall air pollution (Galeotti, Salini, & Verdolini, 2020; K. Wang, Yan, Wang, & Chang, 2020). Therefore, to understand which political factors that affect environmental policy stringency is important due to the pressing nature of the problems these policies aim to address. There is a large scale environmental damage caused by human impact (Leichenko & Eisenhauer, 2016). We therefore need to control human action, and government intervention is a tool conducive to regulation of human behaviour (Kulin & Johansson Sevä, 2019; Wolde-Rufael & Mulat-Weldemeskel, 2021). Consequently, environmental policies has the potential to contribute to lowering environmental degradation. However, more stringent policies force higher costs on the public, on industry and on business owners, so the more stringent policies are, perhaps the more difficult they are for polities to adopt (Woods, 2008, p. 260). It is therefore fruitful to investigate how the political environment, in terms of constraints on political actors, impact the opportunity for more stringent environmental policies. Does higher levels of political stability, i.e., less frequent policy change, hinder or facilitate countries' ability to adapt to an unstable

environment?

A substantial body of research establishes the explanatory power of *veto points*, understood as the institutional or partisan actors whose consent is needed to alter policies, on several policy types and political areas (Mansfield, Milner, & Pevehouse, 2015, p. 403). The formation of veto points is found to impact reform making (Angelova, Bäck, Müller, & Strobl, 2018), to impact trade policy (O'Reilly, 2005), and a higher number of veto points is argued to lower the policy risk for investors (MacIntyre, 2001). The veto point-framework has even been adopted to understand policy decisions during the current Covid-19 pandemic (Parrado & Galli, 2021). Still, to date no study has aimed at exploring whether the formation of veto points directly impact the strictness of environmental policies. In like manner, corruption is a heavily studied topic in political science. The presence of corruption at different levels of government is found to hamper adoption of environmental policies (Wilson & Damania, 2005), and corruption has been found to contribute to enviornmental degradation (Damania, 2002). Corruption is also found to impact how political institutions explain environmental policy adoption (Fredriksson & Vollebergh, 2009). Based on a review of previous scholarship, I arrive at the following research question: *Does the formation of veto points impact the strictness of environmental policies?* The thesis statement is that domestic political institutions are important in order to explain variation in environmental policy stringency. Moreover, I have two main objectives with the research question. Firstly, the aim is to analyse the relationship between variation in the presence of veto points and variation in the stringency of environmental policies. Secondly, the aim is to analyse this relationship's dependency on the levels of corruption.

On the basis of theoretical expectations, I argue that veto points are likely to negatively impact environmental policy stringency. Further, I argue that the relationship between veto points and environmental policy stringency is dependent on the level of corruption. The hypotheses are tested on time-series cross-country data consisting of 32 countries. The modelling strategy is two-way fixed effects ordinary least squares (OLS) regressions with robust clustered standard errors. The results give weak evidence for the assumption that veto points are negatively associated with the strictness of environmental policies. On the other hand, the results reveal that how veto points impact environmental policy stringency is highly dependent on the levels of corruption. The motivation behind the research question is two-sided. Firstly, I wish to further the knowledge about the decision-making processes that lead to more stringent environmental policies. Secondly, I aim to test the theory of veto points on a hitherto unstudied case. By doing so, and by including an exploratory hypothesis on the interplay with corruption, I hope to provide insight on how veto points impact decision-making processes.

1.1 Thesis outline

The thesis is structured as follows. Up next, chapter 2 will present the relevant facts about environmental policies, and give an idea of what it entails to increase stringency. Chapter 3 presents a review of relevant scholarship on the topic of political institutions and environmental policy stringency, and the specified research question is derived from the research gap. The chapter discloses one clear limitation to previous research; whether veto points impact the strength of environmental policies is not yet studied. Chapter 4 provides the theoretical approach for the analysis, and establishes the potential relationship between veto points and environmental policy stringency, and how it might be moderated by corruption levels. I form two hypotheses based on the assumptions and expectations settled in the theoretical framework. Chapter 5 describes the statistical methodology considered apt to answer the research question. This chapter includes descriptions of the empirical data, statistical model and variables included in the analysis. Chapter 6 presents the results and model diagnostics, and investigates the marginal effects of the regressions. In chapter 7 these results are elaborated and discussed further in light of theory and the limitations of this thesis. Lastly, chapter 8 presents the conclusion to the research question, and the implications of this study for future research.

Chapter 2

Background

2.1 Environmental policy and increased strictness

The purpose of this chapter is to give background on what environmental policies are, why they are difficult to adopt and implement, and what increasing stringency might look like in practice. Ever since the arrival of 'the environmental revolution' in the 1960s, environmental policies has gained momentum in the political arena (Baumol & Oates, 1988, p. 1). The range of influences on environmental policies are numerous, as it involves an intricate web of inter-relationships in which policy ideas, structures and processes overlap (Lipp, 2007). To make environmental policies more stringent entails implicitly or explicitly positing costs on polluting or environmentally harmful behaviour (Botta & Koźluk, 2014). Naturally, imposing higher costs on the electorate, public business owners, industry, and society in general, is not an easy endeavour. Environmental policies chiefly requires taking costly action today for future benefits (Finnegan, 2019). It often imposes immediate, concentrated costs on organisations that would benefit financially from the reduction in regulatory burdens. On the other hand, the benefits of more stringent environmental policies are widely dispersed, and not immediate (Woods, 2008, p. 260). In the United States, 'the first generation' of environmental policies produced dramatic environmental improvements. But, the economic and legal costs of the system gradually increased the political stakes for adopting these policies (Kettl, 1998). Companies progressively became dissatisfied with having to pay high costs for compliance. They argued that the policies cost jobs, and made American firms less competitive with companies abroad (Kettl, 1998). Notwithstanding, to increase strictness of environmental policies has its merits. It is therefore valuable to investigate the factors that potentially impact the adoption of these policies. De Santis, Esposito, and Lasinio (2021) writes that "the conventional perception about environmental policy stringency is that it imposes additional costs on firms, which may reduce their global competitiveness thus negatively affecting eco-

nomic growth and employment. But, at the same time, more tight environmental policies can stimulate innovations that may over-compensate for costs of complying with these policies" (De Santis et al., 2021, p. 264). The same authors find that environmental policies in the OECD-member countries had in fact a growth-promoting effect on productivity (De Santis et al., 2021, p. 265). Also, as already stated, more stringent environmental policies seemingly does its job of protecting the environment. Recent research demonstrates that more stringent policies reduce CO_2 emissions, albeit it takes time before the effect of the policies hits the emission rates (Wolde-Rufael & Mulat-Weldemeskel, 2021; Galeotti et al., 2020). More stringent environmental policies are also found to reduce overall air pollution (K. Wang et al., 2020). The effectiveness of pro-environmental policies is, however, largely decided by the degree to which the policy measures are upheld by the actors affected by them (Jagers, Harring, & Matti, 2018, p. 28). Environmental policies come in different shapes and sizes: market-based approaches, such as taxes and renewable energy, voluntary approaches, performance-based measures, and emission standards, "but none by itself is a panacea" (Kettl, 1998). Environmental policies are characterised by the notion of 'continuous improvement'. The policies have to change in relation to changes in society and the changing environment (F. Wang et al., 2020). Despite the various levels of stringency across countries, there is a common trend. Countries are generally implementing increasingly stringent environmental policies aimed to curb emissions and protect the environment (Galeotti et al., 2020, p. 13).

2.1.1 What can it look like in practice?

For context and illustration of environmental policy and the act of increasing strictness, a set of recent examples of both adopted and suggested environmental policies from around the world can demonstrate the complexity. An underlying dimension to all of these cases is that the policies aim to protect the environment. Further, the instrument to do so is to posit costs, implicitly or explicitly, on society. Be it the agricultural sector, private enterprises, or consumers. Consequently, the outcome and consequences of these policies can range from carbon neutrality in 2050 to more expensive steaks in 2022.

Denmark has become self-sufficient in its own energy production and use, with a commitment to renewable energy efficiency, prolonged taxes on energy fuels, electricity, and wind turbines (Sovacool, 2013, p. 829). The country is therefore termed an 'enviornmental leader' (Vogel, 1993, p. 557). In 2019, the government announced a plan to target nitrogen emissions from farming through a suggested policy aiming to guarantee a reduction of 3.400 tonnes in 2020. The costs of these reductions would be put on the agricultural sector. The national farmers' federation termed the suggestion unrea-

sonable as "the consequences would be extremely costly and require a huge workforce" (The Local, 2019). Dutch farmers reacted likewise to being a target for measures of increased costs to cut back emissions in November of 2020 (AP news, 2020). To reach the climate goals put forward by the Paris agreement it was deemed necessary by the Norwegian government to increase taxes levied on CO_2-emissions (Elster, 2021). This policy is likely to lead to an increase in the price of steak in Norwegian grocery stores. This has the aim of giving incentives to reduce consumption of read meat. The efficiency of the policy suggestion is however disputable, as the increase in price is minor and not likely to impact the behaviour pattern of the average Norwegian (Elster, 2021).

The enviornmental progress in South Korea is argued successful partially due to its authoritarian heritage. Han (2015) argues that various path-dependent legacies from Korea's authoritarian developmental state era, in addition to the presidential leadership style and elites' perception of environmental issues, have created conditions where closed, top down environmental policy making has prevailed in this democracy. During Spring of 2021, all 243 local governments in South Korea pledged to achieve carbon neutrality by 2050, supported by the central government. The plan aims to replace fossil fuels with renewable energy as the main energy sources (Hyeong-Woo, 2021). The European Union similarly aims to be climate-neutral by 2050, and have an economy with net-zero greenhouse gas emissions (European Union, 2020). An innate consequence of these goals is to, amongst other actions, adopt market-based policies aiming to transition to renewable energy, such as solar and wind sources.

The view of completely neutralising use of carbon emissions is however not shared globally. As president of Russia, Vladimir Putin, states: "when these ideas of reducing energy production to zero or relying only on solar power are promoted, I think humanity could once again end up in caves [...]" (The Moscow Times, 2019). In Russia, the first law aiming to limit private enterprises' greenhouse gas emissions was passed in spring of 2021. Companies have to begin reporting their emissions from year 2024 (The Moscow Times, 2021). The bill however also introduces a carbon credit system: companies can receive carbon units in exchange for investments in reforestation, recycling, or carbon capture (The Moscow Times, 2021).

Lastly, the water crisis in India has evolved to a complicated and urgent political issue. In 2012, the National Water Policy was proposed which included, amongst other elements, adaption to climate change by increased government regulation (K. M. Singh, Singh, Meena, & Kumar, 2013). The federal structure of the country introduced challenges to this policy adoption. The Bihar government, the governing authority of the Indians state of Bihar, decided to oppose the National Water Policy, as it was a "flagrant violation of the federal structure, as water comes under the state list of subjects". Further, the water resource minister of Bihar argued how the regulations of the water resources should belong to the state where these resources exist. It objected to water

being termed a national resource (Mishra, 2013).

These empirical examples illustrate intricate policy suggestions and political situations. The examples are purely meant as illustrations to what environmental policies might look like in practice, I do not aim to analyse them any further. The examples do however show how political institutions and societal actors play important roles in the politics concerning these policies. Moreover, there are relatively few political scientists that would contest the claim that domestic institutions shape public policy (Cao & Prakash, 2012, p. 67). The following chapter will present previous scholarship relevant to the research aim of this thesis.

Chapter 3

Literature review

This chapter presents an overview of the relevant scholarship. The research mentioned all have valuable insights to the puzzle I wish to examine: whether there is evidence for a connection between domestic political institutions and the degree of strictness to enviornmental policies. The review uncovers a critical research gap, namely that we do not know whether veto points impact the strictness of environmental policies. Existing scholarship that aims to explain variation in the strength of enviornmental policies do not apply the veto point framework holistically, and we therefore do not know whether there is a direct relationship between the two. Also, previous research uncovers an interplay between political institutions and corruption in the study of environmental policy stringency. Section 3.3 presents the research question which is derived from the research gap.

From existing research we know that institutions play a major role in shaping policy outcomes across countries (Finnegan, 2019). Scholarship on the effects of domestic institutions on environmental-related policies has substantiated the hypothesis that veto points affect policy adoption. In general, established literature on veto points has shown that the possibility and the extent of policy change is a negative function of their number and ideological heterogeneity (Cao & Prakash, 2012, p. 70). Lower levels of political constraints are found to be significantly associated with larger decreases in oil and energy intensity in democracies (Duffield & Hankla, 2011, p. 202). This is argued to be because countries with fewer and less diverse veto points will be more likely to adopt policies that successfully reduce oil consumption and intensity (Duffield & Hankla, 2011, p. 192). Madden (2014) find that veto points negatively impact how major climate policies are, and the rates of climate-policy passage. Climate policies are coded as major if the policy is passed as new policy/significant amendment to an existing policy, and if the policy had any media coverage, or other visible coverage (Madden, 2014, p. 585). This thesis focuses on the level of cost that policies impose on environmentally harmful behaviour. The use of major policies in Madden (2014)

therefore has little conceptual overlap with environmental stringency. The number of veto points has a significant negative effect on both climate policy passage and how major these policies are (Madden, 2014, p. 580). Policies targeting climate issues are also part of the umbrella of environmental policies. The findings that veto points affect climate policies can therefore be assumed transferable to general environmental policies. However, the study says little about how veto points affect the *strictness* of these policies. The two next sections will look closer at previous research on the effects of domestic institutions on the strictness of environmental policies.

3.1 Institutions and the strength of environmental policy

Much of the research which encompasses political institutions and the strictness of environmental policies is produced within the field of political economy. The findings of these studies differ, and not all correspond to the results of Madden (2014) and Duffield and Hankla (2011) where veto points clearly negatively impact climate policies and oil regulating policies. The findings are varied in both quantitative and qualitative approaches. The results reflect the multidimensional reality of both the veto point approach and of environmental policy stringency. The studies included in the following section 3.1.1, are quantitative studies where political institutions are adopted to explain variation in environmental policies. The section will demonstrate that veto points are likely to help explain variation in the strength of environmental policies but that, to the best of my knowledge, the direct relationship has not yet been investigated. Section 3.1.2. presents case-studies that illustrates the complexity of the puzzle I wish to examine.

3.1.1 Veto points and environmental policy stringency

Fredriksson and Millimet (2007) find that an increase in veto points (measured by moving from uni- to bicameralism) pushes the pollution tax towards the social optimum, with the effect being conditional on corruption. This indicates dispersion around the optimal tax is lower under bicameralism. The dependent variable is super and diesel gasoline prices, but they test the relationship on several measures of enviornmental policy stringency and find similar results (Fredriksson & Millimet, 2007, p. 229). The findings are based on cross-sectional data of 86 democratic countries from 1998. The study shows that bicameralism has a positive effect on gasoline taxes, which is magnified as political stability increases (i.e. more veto points) and veto players are less corruptible (Fredriksson & Millimet, 2007, p. 239). As the results are based on cross-national

data, it is difficult to say much about the role of bicameralism on policy stringency based on observations from one year for each country. The study does not provide intracountry variation and therefore cannot say much about the characteristics of each country. However, an important implication of their study is that the effect of bicameralism on gasoline taxes is altered as veto players become less corruptible (Fredriksson & Millimet, 2007, p. 219). The authors find statistical evidence that corruption have an important role in the interaction between the number of veto points and environmental policy stringency (Fredriksson & Millimet, 2007, p. 238). The authors also find less dispersion of environmental policies in their bicameral sample (Fredriksson & Millimet, 2007, p. 239). This yields two important suggestions for this thesis. Firstly, it suggests that corruption might act as a moderator to the direct relationship between veto point proliferation and environmental policy stringency. Secondly, bicameralism, might be a less fruitful political environment for more strict environmental policies.

Cao and Prakash (2012) examine the effect of trade competition on regulatory races in the environmental area conditional on the formation of veto points. They expect that governments respond to trade pressures by lowering regulatory costs (Cao & Prakash, 2012, p. 66)The theoretical argument is that more visible issues are impacted to a higher degree by veto points. This is due to veto points providing institutional opportunities to block policy change. When and if constituencies will be motivated to exploit these opportunities, will therefore depend on the visibility of the pollutant in question (Cao & Prakash, 2012, p. 70). This is an interesting nuance to the traditional veto point argument by Tsebelis (1995) upon which the authors build their model of political institutions. It also corresponds to the idea of *major policies* adopted as the dependent variable in Madden (2014) described above. Both studies argue to an extent that veto points impact policies with more visibility to a higher degree than policies with less prominence. The regression coefficients for the effect of veto points on *de jure policy stringency* (operationalised as treaty commitment for a proxy for regulatory stringency) is not significant in their analysis. The focus of Cao and Prakash (2012) in this study is to examine the effect of trade competition *conditional* on the different levels of veto points. They therefore do not intently examine the direct effect of veto points on policies. Moreover, the authors find that veto points have constraining effects on policy changes regarding air pollution, but weaker constraining effects on policies regarding water pollution (Cao & Prakash, 2012, p. 79). The results of this study actualise an investigation into the direct relationship between veto points and environmental policies, and indicate that an increase in the presence of veto points can make adopting environmental policies less likely.

Fredriksson and Vollebergh (2009) argue that greater government corruption have a negative impact on the stringency of environmental policy, but that this effect declines in federal systems. The dependent variable of this study is energy policy standards,

and reflects the consequences of combined regulatory strategies used by different OECD countries (data from 1986-1992) (Fredriksson & Vollebergh, 2009, p. 209). Their argument is that a greater level of corruption lead to greater influence of the two lobby groups; consumers and capital owners (Fredriksson & Vollebergh, 2009, p. 205).

Their intuition is as follows: federalism imposes another layer of government that the lobbies need to spend resources on to have policy influence. The lobby groups will therefore buy fewer favours when policy influence becomes more costly (Fredriksson & Vollebergh, 2009, p. 208).[1] Fredriksson and Vollebergh (2009) did not include federalism as an individual explanatory variable in their regressions. The study therefore cannot say much about which direct effect federal sub units have on the strictness of environmental policies. Also, only three federal countries are included in the sample of 22 OECD countries which the results are based on (Fredriksson & Vollebergh, 2009, p. 210). Federal states with high variation in strictness of enviornmental policies like Germany, Austria, and Spain are omitted from their study. Despite this shortcoming, the analysis indicates that the effect of corruption on environmental policy stringency is conditional on whether the system is federal or not. Hence, another layer of government can 'protect' environmental policy stringency from the negative impact of corruption.

3.1.2 A multifaceted reality

In qualitative research, the direct relationship between federalism and promotion of energy policies has been studied. It is detected instances where federal units can slow or block policy for energy transitions, and instances where subnational units give potential to introduce new policies and programs (Balthasar, Schreurs, & Varone, 2020, p. 6). In a historical-qualitative analysis, Vogel (1993) shed light on the complexity of the relationship among institutional factors. Referring to the Unites states, he concludes that once stringent environmental policies are in place they are difficult to remove. The institutional lock-in can therefore preserve stringent policies. It does however also make it difficult to adapt to external changes, and innovate new policies, and make changes to the ones in place. With multiple veto points, change is difficult (Fiorino, 2011, p. 381). The same somewhat arbitrary conclusion arises in his later research which also focuses on environmental policy stringency. Vogel (2003, p 575) writes how the fragmented system of the EU provides opponents of policy change with multiple veto points that can hinder policy change. Simultaneously the EU encompasses a wide array of interests, and therefore finding one access point to policy change is relatively easy. These suggestions reveal that having more veto points can be beneficial in situations where external pressures encourage reduction in the stringency of

[1]The inclusion of federal units as veto points is still contested in literature, and the theory chapter elaborates on why federal sub units will be counted as a veto point in this thesis.

environmental policies. And also that more veto points might allow for better access of pro-environmental interests.

3.2 Institutions and corruption

The research presented thus far has in one way or another encompassed veto points as an explanatory factor for the variation in strictness of environmental policies. There is another common denominator to several of these contributions: the impact of the level of corruption on the strictness of environmental policies, and on the relationship between institutions and environmental policy. Both theoretical and empirical research support the argument that institutional settings affect the way policy makers respond to environmental concerns (Pellegrini, 2011, p. 77). Pellegrini (2011, p. 81) also demonstrates how one cannot investigate the potential effects of political institutions on environmental policy stringency without controlling for the concept of corruption. Pellegrini and Gerlagh (2006, p. 332) include both corruption and democracy as explanatory variables and find that corruption stands out as a substantial and significant determinant of environmental policy stringency, while proxies of democracy have an insignificant impact. They also find that *institutional improvements* and reductions in corruption induce higher economic growth rates and stricter environmental policies (Pellegrini & Gerlagh, 2006, p. 332).

Fredriksson and Svensson (2003) present a theoretical model where environmental policy making is influenced by corruption and political stability. They argue that political instability makes it less effective for polluting industries to bribe the administration, and thus the stringency of environmental policies increases (Fredriksson & Svensson, 2003, p. 1387). The concept of political instability is not decidedly related to the concept of veto points. They define political instability as the replacement rate for the government administration in power (Fredriksson & Svensson, 2003, p. 1394). However, the findings indicate that the formation of political structures matter to variation in the strictness of environmental policies. Finally, Fredriksson and Wollscheid (2006) find through propensity score matching that democracy is positively related to environmental policy stringency, but that the results are largely driven by the parliamentary democracies. The institutions of parliamentary democracies therefore might be a driving force for environmental stringency rather than presidential-congressional systems (Fredriksson & Wollscheid, 2006, p. 382). According to the authors, the underlying reasons for the stronger impact of parliamentary systems is a lower degree of 'separation of powers' and a higher level of legislative cohesion (Fredriksson & Wollscheid, 2006, p. 383). Fredriksson and Wollscheid (2006) do not include corruption in their regressions, so the findings probably suffer from omitted variable bias given the strong

prediction power of corruption (Pellegrini, 2011, p. 81). This aside, the study can suggest that the discrepancy in the effects of democratic institutions yields reasons to believe that the formation of political institutions have explanatory power on the strength of environmental policies.

According to this literature review, we therefore know that veto points impact climate policies Madden (2014) and oil consumption (Duffield & Hankla, 2011). We know that veto points impact air pollution policies to a higher degree than water pollution policies (Cao & Prakash, 2012), that bicameralism has a positive effect on the strictness of environmental policies, conditional on corruption Fredriksson and Millimet (2007), and we know that the impact of corruption on the strictness of enviornmental policies is lower in federal countries (Fredriksson & Vollebergh, 2009). However, we do not know if veto points impact the strictness of environmental policies directly. The literature review also shows that political institutions impact the strictness of environmental policies in different ways, and that corruption is an important indicator for variation in strictness (Pellegrini & Gerlagh, 2006), also in an interplay with political institutions (Fredriksson & Vollebergh, 2009; Fredriksson & Svensson, 2003).

3.3 Research question

The existing scholarship reveals the intricate reality of how political institutions are related to the level of environmental policy stringency. Moreover, the review has uncovered a distinct research gap as we lack knowledge about whether veto points impact the strictness of environmental policies. This research question will guide my efforts to help contribute to filling this gap in research:

RQ1. **Does the formation of veto points impact the strictness of environmental policies?**

The main goal is therefore to study the direct relationship between veto points and environmental policy stringency. Withal, the scholarship on the strictness of environmental policies points to the deciding affect of corruption levels. In particular the study of Fredriksson and Vollebergh (2009) demonstrate that "corruption have an important role in the interaction between the number of VPs [veto players] and environmental policy" (Fredriksson & Vollebergh, 2009, p. 238). The theory chapter will therefore first establish the theoretical expectations regarding the direct relationship between the formation of veto points and the stringency of environmental policies, followed by expectations concerning the moderating effect of corruption on this relationship.

Chapter 4

Theoretical approach

The traditional veto player approach as presented by Tsebelis focuses on how different institutional settings enable the change of the status quo in terms of change of policy (2002, p. 17). The strictness of these policies, however, is a somewhat different case. To investigate the impact of veto points on policy strictness, portend to examine the direction of the policy change not only the change itself. The literature review presents two main implications for the development of the theoretical framework. Firstly, the holistic approach of veto points has not yet directly been tested on the strictness of environmental policies. This thesis will therefore apply a framework that enables to test the veto point theory. Secondly, the analysis can benefit from taking into account the impact of corruption in examining how veto points impact environmental policy stringency.

This chapter will first define and introduce the main theoretical concept, namely veto points. The main view of scholars applying the veto point-framework, is that the more governmental power is dispersed, i.e. the more veto points various constitutional structures carry, the lower the potential for policy change. As this thesis seeks not only to understand policy change, but policy stringency, the definition of veto points is followed by a presentation of the policy making environment for increased policy stringency. Then, I theorise the potential moderating effect of corruption on the impact of veto points on variation in stringency. Conclusively, two hypotheses are formed in section 4.4 based on the theoretical expectations.

4.1 The concept of veto points

The veto point approach is relatively young in comparative politics, but the approach is embedded in a rich tradition that considers the role of institutions (Hallerberg, 2011, p. 22). Institutions can be defined as "sets of rules that dictate the creation of structures

that define the parameters of options open to political actors" (Taylor, Shugart, & Lijphart, 2014, p. 7). The structures that define the power and roles of political actors are assumed to have influence on the policy-making process and outcome.

In the study of how political institutions impact policy making, the veto point approach, first developed by Immergut (1992), Huber, Ragin, and Stephens (1993) and Tsebelis (1995, 2002), has strongly influenced research over the last decades. One reason for the influential position of this approach, is its nature as parsimonious and testable. Also, it can cover political systems all over the globe. Veto points exists in all types of regimes, even in total autocracies (Ganghof, 2003). Both democratic and non-democratic regimes have several veto points. Domestic politics in non-democratic countries is rarely a pure hierarchy with a unitary decision-maker and no demand for support by the military or a political party (Mansfield et al., 2015). A benefit of the veto point approach, is that it admits the same framework of analysis to democratic and autocratic states, to presidential and to parliamentary regimes, to two- and to multiparty systems, and to unicameral and to bicameral systems.[1]

Tsebelis defines the concept of veto points as "individual or collective actors whose agreement (by majority rule for collective actors) is required for a change of the status quo" (Tsebelis, 1995, p. 301). The fundamental argument of the veto point framework as presented by Tsebelis, is that to change the legislative status quo, a certain number of actors must agree on the proposed change (Tsebelis, 2002, p. 2). To summarise his argument, a polity's potential for policy change is a function of three variables: 1) The number of veto players, 2) the distance between the preferences of these veto players (congruence), and 3) the veto players' internal cohesion (Ganghof, 2003, p. 8). Tsebelis argue generally about the effects of institutions as he emphasises that domestic political institutions affect the ability of states to change, *simply in one way or another*, policy (Tsebelis, 1995, p. 295). These ideas are still relevant for developing this theoretical framework, as increasing strictness of environmental policies also presupposes a change of these policies. How veto points are likely impact environmental policy stringency will be further discussed in section 4.2. This section will focus on which political actors and institutions in a polity that constitutes as veto points.

A fruitful complimentary definition of veto points is put forward by Immergut et al. (1992): "strategic points of uncertainty that arise from the logic of the decision process itself" (Immergut et al., 1992, p. 66). Moreover, "the fate of legislative proposals [...] depends upon the number and location of opportunities for veto along this chain"

[1]This thesis does not define potential veto players such as army officials or influential ministers as part of the framework. Some potential veto points will need to be considered as random noise at this level of analysis (Tsebelis, 2002, p. 81). This is related to the problem of identification which will be discussed in section 4.1.1.

(Immergut et al., 1992, p. 63). Accordingly, Huber et al. (1993, p. 713) argue that the nature of these institutions, or the 'rules of the game', shapes the potential for economic interests and organised groups to influence policy. The thesis follows the distinction made by Heller, Keefer, and McCubbins (1998), where veto points are the institutions where policy proposals are voted on and veto players are the individual or collective actors that occupy these intuitions (O'Reilly, 2005, p. 657). Veto power is further defined as: saythe power to ratify, or to block policy proposals (Immergut et al., 1992, p. 66).

Ganghof (2003, p. 3) presents three main issues arising in veto point literature and empirical studies applying the framework: 1.) the problem of identification, 2.) the problem of preference measurement, 3.) the problem of equivalence. The theory chapter will discuss the related problems of 1.) and 3.), which concern the concept of veto points. All three issues are further discussed in the methodology chapter, section 5.3., where the concept of veto points is operationalised. Veto point approaches in comparative politics share the understanding of policy makers as instrumental actors that are constrained by political institutions. However, the approaches differ in the identification of these veto points, and how the preferences of veto points are determined (Becher, 2010, p. 36).

4.1.1 Identifying the veto points

In literature it is proposed different categories of veto points. The two dominant sets of categories are *partisan veto players* and *institutional veto players*, and furthermore *competitive* and *collective veto points*. Tsebelis (1995) introduced the first categorisation. The partisan veto players are the parties which are members of a government coalition whilst institutional veto players are veto players specified by the Constitution (Tsebelis, 1995, p. 302).[2] Birchfield and Crepaz (1998) cogently advocate the distinction between competitive and collective veto points. Competitive veto points occur when different political actors operate through separate institutions with mutual veto powers. Collective veto points emerge from institutions where the different political actors operate in the same body and whose member interact with each other face to face (Birchfield & Crepaz, 1998, p. 182). They find empirical support for this distinction in the context of income inequality in industrialised democracies. However, the theory of actors' preferences based on the distinction between collective and competitive veto points is argued to not yet be sufficient for guiding coding decisions (Ganghof, 2003; W. J. Henisz, 2004). This thesis follows a holistic approach to the veto point theory, based on an argument that all of these categories should be incorporated as they all have influence. This is in line with recent research (Duffield & Hankla, 2011; Madden,

[2]Tsebelis uses the terminology of veto players regardless of denoting intuitions or actors.

2014; Cao & Prakash, 2012; Becher, 2010).

The problem of identification arises from the act of distinguishing real veto points from other potentially influential actors (Ganghof, 2003, p. 3). Due to not all veto points being veto points in all policy areas, the identification of all potential veto points is not an easy endeavour. Central banks are not veto points in the field of enviornmental policy, however, influential enterprises might be potential veto points in studying the stringency of environmental policies (Jahn, 2011, p. 49). Therefore, not all potential veto points will necessarily be included in this analysis, and the selection of veto points is derived from theory.

The categorisation presented by Tsebelis (1995) is considered an advantageous point of departure to clarify which institutions that constitutes as veto points in this study. The veto points arising from the constitution differs from country to country. The definition in (W. J. Henisz, 2002, p. 363) is a beneficial clarification based on Tsebelis' categorisation: "a branch of government that is both constitutionally effective and controlled by a party different from other branches". Constitutions often assign certain powers to the executive and others to the legislature. Domestic actors may either share control over the policy process or possess distinct powers (Mansfield et al., 2015, p. 405). Veto points can therefore be the head of state, government parties, and legislative chamber(s) (Tsebelis, 1999, p. 593). To emphasise, whether these institutions has actual veto power varies from country to country. For instance, the head of state in West European countries have no veto power. Even the French and Finnish president does not constitute a veto point (Tsebelis, 1999). Whilst, for instance, in the United States and Russia the head of state has veto power.

Other potential veto points are more contested in literature, namely federal units, the judiciary and pluralist lobbying systems. Federal units and the judiciary are considered potential veto points in this study. This is much due to data limitations, as there is no accessible veto point operationalisation that includes pluralism. Crepaz (2002, p. 170) finds that the setting in which veto points interact defines the veto points' capacities to change the status quo, and corporatism is found to have a major positive effect on the redistributive capacity of the state (Crepaz, 2002, p. 182). Why and how it is considered a veto point is however not clearly argued by Crepaz (2002), nor in the consecutive studies incorporating it in their concept of veto points. This thesis will not assume pluralist lobbying system as part of the veto point concept, but assumes that interest groups affect environmental policy stringency indirectly (Mansfield et al., 2015, p. 406). Interest groups clearly impact political decisions, and influence the preferences of veto points, but they are not by definition determinants of policy outcomes (Hoffmann, 2010, p. 58).

Immergut et al. (1992) writes how federalism and direct democracy represent powerful institutional veto points, as the sub-national units can challenge policy adoption. Federalism was also later found to be a stumbling block for the expansion of the Swiss welfare state (Obinger, 1998, p. 241). Some states also opposed the relatively ambitious environmental agenda of President Obama (Konisky & Woods, 2016). Fredriksson and Vollebergh (2009, p. 207) write how federal systems therefore incorporate an additional layer of government veto point. Federal states can oppose adoption and implementation of environmental policies and regulations on state level. I therefore expect federal sub units to be potential veto points to environmental policy adoption.

Tsebelis (2002, p. 205) argues that the judiciary branch does not always function as a veto point. The judiciary has however been found to play an important role in environmental governance in several countries (Sahu, 2005; Kramarz, Cosolo, & Rossi, 2017, p. 32). It can further be argued that stalling decisions made by constitutional courts are just as consequential for policy stability as a presidential veto (Nalepa & Xue, 2018, p. 8). The judiciary is therefore also considered a veto point for environmental policy adoption.[3]

4.1.2 The assumption of equal veto power

As the identification of potential veto points is clarified, it is quite evident that the formation of veto points differ across countries and across time. Birchfield and Crepaz (1998, p. 181) make a legitimate point in that not all veto points are created equal. In the veto point framework put forward by Tsebelis, the two categories of veto points are assumed to have equal veto power (Tsebelis, 1995, p. 302). This assumption is related to *the problem of equivalence*. Veto points may not be similar in all respects and this raises the question of whether one should distinguish between the different types of veto points when testing the theory empirically (Ganghof, 2003, p. 3). This thesis will not distinguish between different types of veto points, and the relative power of the veto points is therefore not accounted for. The theory on relative veto power on environmental policies is not developed (Madden, 2014).[4] So, adding random weights to measure veto points is also a somewhat arbitrary task. The results of this study therefore relies on the assumption that veto points have approximately equal average effect on environmental policy adoption.

[3]The disunity on whether the judiciary and federal units are veto points will be accounted for in the empirical analysis by using two operationalisations of veto points.

[4]For instance, Huber et al. (1993) make a distinction between strong and weak federalism. They write that as part of their index, the strength of federalism is coded "high," "medium," or "low", without revealing the interval justifications (Huber et al., 1993, p. 727). This prevents reliability, as the lack of explanation and argument for the coding of relative veto is not evident.

4.2 The policy-making environment for increased policy stringency

"If institutions are purported to have a kind of staying power, then how can the same institutions explain both stability and change?" (Immergut, 1992, p. 57). This is a question that is relevant to anticipating the effect of veto points on environmental policy stringency. So far, the theory chapter has explained and defined the concept of veto points. The fundamental argument common to the veto point approaches is that as the number of veto points increases, the space for a policy which departs from the status quo is reduced (Mansfield et al., 2015). A change from the *status quo* is here defined as an increase or decrease in the stringency of environmental policies.

The duality in using veto point theory to explain policy stringency, is that veto points may negatively impact policy change, but more veto points can keep intact stringent policies that are already in place because they preserve status quo. Policies therefore cannot as easily be made less stringent for popularity, or due to external changes such as economic crises or pandemics, ergo making policies remain stringent over time. As Tsebelis states regarding economic growth "It is not clear whether many veto players will lead to higher or lower growth, because they will 'lock' a country to whatever policies they inherited, and it depends whether such policies induce or inhibit growth" (2002, p. 204). So, it depends on whether the policies in place are already stringent. Yet, adopting policies that are more stringent, can be argued difficult for the same reasons that policy change is difficult. One can argue that veto points shape decision making in that they reduce the likelihood that substantially new regulations will be adopted (Daley, Haider-Markel, & Whitford, 2007, p. 697). This section will systematically discuss these arguments.

To efficiently study the veto point approach, I assume that political parties have well-defined, single-peaked preferences over a *one-dimensional policy* (Tsebelis, 1999, p. 605). In reality, environmental policies are multidimensional. For instance, a policy for emission standards includes different pollutant types, duration for regulation, target groups, and so on. Assuming a one-dimensional policy enables simplicity as well as access to available data (Becher, 2010, p. 36). A prevalent argument in literature is that an increase in the number of veto points can make policy change more difficult, as institutional veto points generally prefer the status quo (Becher, 2010, p. 36). This can be termed the institutional approach to veto point theory (Hallerberg, 2011, p. 722). Huber et al. (1993) hypothesise that aspects of constitutional structure that offer multiple points of influence on the making and implementation of policy are inimical to welfare state expansion, and will be negatively associated with various measures of welfare state effort. The increase in veto points will hinder far-reaching reforms in

social policy. Where power is dispersed in representative institutions, small interest groups are able to block legislation. This situation favours the status quo over major policy change (Huber et al., 1993, p. 722). Based on these arguments, one can therefore assume that an increase in the number of veto points will make it difficult to adopt stricter environmental policies. The institutional approach is criticised because it does not incorporate actor preferences (Jahn, 2011, p. 47).

4.2.1 Political constraints and the distribution of preferences

The normal political condition is not consensus, but a diversity of preferences. One can say that veto points are institutional mechanisms that put a stop to the cycling of preferences by restricting unlimited choice (Immergut et al., 1992, p. 64). Veto points do however also contain preferences of their own. The preferences of veto points are therefore considered essential to predicting how veto points may affect environmental policy stringency. This is where the congruence and cohesion of the veto points enter the framework. *Cohesion* refers to the policy positions of the different veto players that constitute the veto point. *Congruence* refers to the policy positions of different veto points (Hallerberg, 2011, p. 23). The stability will not decrease with an increase in the number of veto points if the preferences are unaccounted for (Tsebelis, 2002, p. 19). Put differently, adding a veto point to the policy-making process, does not necessarily make increasing policy stringency more difficult. However, if this additional veto point has preferences diverging significantly from other veto points, it can be assumed to make increasing the strictness of policies more difficult. Without knowing the specific interests of this veto point, one can assume that increasing the number of veto points, decreasing the congruence between these veto points, and decreasing the internal cohesion creates the necessity for compromise, and therefore maintaining status quo or lead to lower stringency.

Where institutional actors are heavily dependent on each other for policy development, pressures to achieve mutually acceptable compromises will intensify (Pierson, 1995, p. 459). Pierson (1995, p. 460) argues that under these circumstances, policymakers tend to pursue the lowest common denominator policies, which reflects the views of the least ambitious participants in a minimum winning coalition. One can denote low stringency as the least ambitious policy, as it puts less cost on firms and consumers. This argument thus indicates that a formation with more veto points, in particular coalition parties, will not only make change more difficult, but the strictness of the policies will be lower. This argument can be furthered substantiated with Tsebelis' notion that "if there are many veto players separated by large ideological distance, then legislation can only be incremental" (Tsebelis, 1999, p. 604).

The difficulties of policy making grow as the number of veto points increases, as

the veto points' preferences diverge and as the internal coherence of the actors declines (Mansfield et al., 2015, p. 405). There is also evidence in literature that the probabilities for policy adoption decreases merely with an increase in the number of veto points (Huber et al., 1993). So, an expanded formation of veto points will induce more political constraints on policy makers, and make it more difficult to adopt policies that diverges from status quo. To increase the strictness of policies entails policy change. Therefore, the same political environment that limits the feasibility of policy change, is also likely to limit the opportunities for increased stringency (Mansfield et al., 2015, p. 405). That said, more political constraints in a country can also "ensure policy stability so that policies have time to work" (Weaver & Rockman, 2010; Tsebelis, 1995, p. 295). As mentioned previously, veto points can keep policies intact and protect the levels of strictness from fluctuations in economy or other external pressures (Vogel, 1993, p. 575). This is where I argue that the modifying role of corruption enters the framework.

4.3 The interplay with corruption

The main story of this thesis is to investigate the relationship between variation in veto points and an increase or decrease in the strictness of environmental policies. That is why the research question asks: Does the formation of veto points impact the strictness of environmental policies? Based on previous research on the relationship between political institutions and the strictness of environmental policies, I believe that in order to sufficiently study this question, an interplay with corruption will should be accounted for.

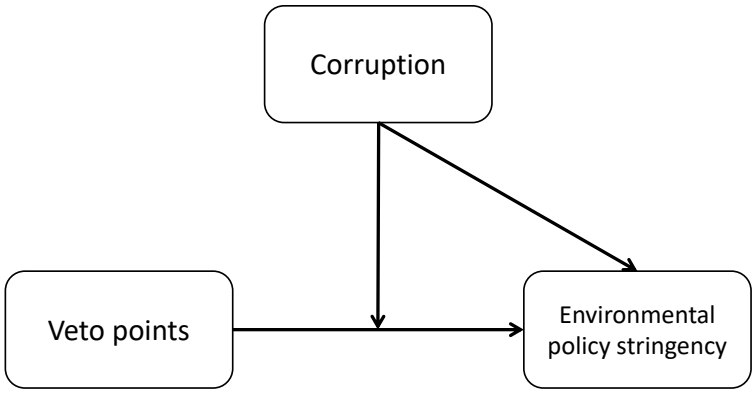

Figure 4.1: *Directed graph of relationship*

Firstly, both corruption and veto points are expected to have individual direct effects on the strictness of policies. The previous sections of this chapter narrated the potential direct impact of veto points. In sum, the premise is that the same political environment that limits the feasibility for policy change, is also likely to limit the opportunities for increased stringency. Secondly, the direct effect of corruption is touched upon in the literature review, section 3.2. Corruption is established as a factor with strong negative impact on the strictness of environmental policies (Lopez & Mitra, 2000; Pellegrini & Gerlagh, 2006; Damania, 2002; Mauro, 1998). Corruption obstruct the environmental policy-setting, as it presents business interests with more opportunities to influence political decision-making. It also impedes the coercive power of the state by lowering the quality of inspections, monitoring, and the capacity for bureaucrats to design and implement policies (Povitkina, 2018, p. 412). This section will expand on the third arrow, illustrating that corruption conceivably impact the relationship between veto points and the strictness of environmental policies.

Corruption is understood as the "'misuse of public office for private gain', where 'private gain' may accrue either to the individual official or to groups or parties to which he belongs" (Treisman, 2007, p. 211). Similar to veto points, corruption levels are present to varying degrees across all classifications of political systems (Bäck, Teorell, & Lindberg, 2019, p. 151). As deliberated in section 4.1., veto points determine the 'rules of the game' by shaping the potential for economic interests and organised groups to influence policy (Huber et al., 1993, p. 713). A corrupt setting implies a 'rotten game', in that the short-term costs of being honest are high, and so are the short term benefits of being corrupt (Persson, Rothstein, & Teorell, 2019, p. 800). The intuition is that in the setting of a 'rotten game' the impact of veto points on the strictness of environmental policies will differ from settings which are 'less rotten', where there are rather short-term costs of being corrupt. Settings with high corruption and a stronger presence of veto points is assumed to indicate an increase in the number of corrupted veto points. This follows an argument forwarded by Persson et al. (2019), that in a systemically corrupt society, (almost) everybody expects (almost) everybody else to be corrupt. The high stakes of being involved in more "honest" behaviour therefore influence all actors to be corrupt (Persson et al., 2019, p. 803).

4.3.1 How can corruption moderate the relationship?

It is not apparent *how* corruption can impact the relationship between veto points and the strictness of environmental policies. Fredriksson and Vollebergh (2009) argue for the interplay between federalism an corruption as follows: federalism equals an additional layer of government. Moreover, the greater the number of political units involved in determining policy, the larger the number of bribes paid by the lobby

groups, and the more expensive it becomes for these groups to influence policy through influence-seeking (Fredriksson & Vollebergh, 2009, p. 206). Following this logic, one can expect political systems with high levels of corruption and few veto points to have rather low levels of environmental policy stringency, because it will be less expensive to pay out the veto points present in the political system.

This argument pertains to an extent with the *the greasing wheel hypotheses*, which suggests that corruption is beneficial to corporate activities and firms for achieving their goals of policy influence (Heo, Hou, & Park, 2021, p. 35). If this is the reality, then corruption will not only be beneficial to influence-seeking industries and interests that lobby for government to tolerate over-exploitation of the natural resource, but it will also benefit pro-environmental interests. Following the logic of Fredriksson and Vollebergh (2009), high levels of corruption and and an increase in the presence of veto points can therefore likewise impact the strictness of policies negatively, as pro-environmental interests will not have the means to pay bribes. One can therefore expect the effect to go in either direction. That said, environmental policy making is argued to have an intrinsic pro-industry bias. Environmental regulation often imposes immediate, concentrated costs on organisations that would benefit from the reduction in regulatory burdens. The benefits of more stringent environmental policies are on the other hand widely dispersed, and not immediate (Woods, 2008, p. 260). The policies are pro-industry because it is unlikely that pro-environmental interest organisations will cancel out the heavy mobilisation for political action from industry (Woods, 2008, p. 260).

It is however possible to turn over these arguments. The argument still focuses on institutions with veto power as access-points for organised interests and societal groups to the decision-making process. With additional veto points, comes additional access points. The chance of finding a veto point with preferences that can correspond to your interests is therefore more likely than in a system with fewer veto points (Vogel, 2003, p.575). Likewise, in a system with high levels of corruption and more veto points, finding veto points to bribe is easier because there are more veto points to choose from. Veto point theory claims that if one veto point opposes legislation, then the policy will not be adopted and implemented. Because as long as a veto point remains in the same position, status quo cannot be changed (Tsebelis, 1995, p. 296). In systems with higher numbers of veto points and high levels of corruption, it is more likely that anti-environmental interests can bribe *one* veto point to hinder adoption of more stringent environmental policies. Corruption further might grease the wheels for this organisation, making it difficult for the polity to adopt more stringent policies. High levels of corruption and many veto points, i.e., access points, can therefore make the adoption of substantially stringer policies very difficult. This is given that the process of adopting and implementing environmental policies are pro-industry biased (Woods,

2008).

To conclude, there is reason to believe that corruption will impact how veto points affect the strictness of environmental policies. Referring to the discussion on how corruption might impact this relationship, one can expect the effect to go in either direction. The analysis on this interplay should therefore be exploratory, as there is little theoretical foundation for expecting the direction of the interplay.

4.4 Hypotheses formulation

I intent to determine whether the formation of veto points have an independent direct effect on environmental policy stringency, or whether this effect is dependent on the levels of corruption. Based on the theoretical discussion the statistical analysis will test these hypotheses about the relationship between veto points and environmental policy stringency:

Hypothesis 1 *A higher number of veto points (i.e., more political constraints) correlates with lower levels of environmental policy stringency.*

Hypothesis 2 *Corruption has a moderating effect on the relationship between veto points (i.e., political constraints) and environmental policy stringency.*

Chapter 5

Methodology

This chapter will explain how the research question will be answered RQ1: Does the formation of veto points impact the strictness of environmental policies? Firstly, I will present and discuss the data structure and the variables chosen to measure the concepts of interest. This is followed by a presentation of, and reasoning for, the statistical model; two-way fixed effects OLS regression with clustered standard errors on country. Finally the chapter presents a summary of the data and variables.

5.1 Data structure

The analysis is based on publicly available observational panel data from multiple sources: the OECD (OECD.Stat, 2017), Varieties of Democracy (V-Dem and V-Party) (Coppedge et al., 2021; Lührmann et al., 2017), Database of Political Institutions 2017 (DPI) (DPI Dataset, 2017), Political Constraints Dataset (W. Henisz, 2000), and the World Bank Development Indicators (World Bank, 2021). The data has been merged into one dataset which contains 13 variables and 772 country/year observations. The data is an unbalanced panel as some countries have missing data for at least one time period. This will not affect the statistical methodology compared to a balanced panel (Stock & Watson, 2012, p. 390).

Research on the effect of veto points tend to focus on countries that share predispositions such as EU-membership, OECD-membership or democratic stability. I choose to include countries that differ on these variables. The theoretical framework should be universally applicable, as long as omitted variable biases are adequately controlled for. The panel data covers all OECD-member countries and BRIICS (Brazil, Russia, India, Indonesia, China, and South Africa), which is 32 countries in total. Most countries have data from 1990-2012, apart from the BRIICS and a few OECD-members that have data available for the time period 1990-2015. All variables are yearly measures. The variables retrieved from V-Party are used to construct new variables for this anal-

ysis. These variables have observations registered for the first year of the election year cycle. This will be elaborated on in section 5.4.2.

5.2 Operationalising environmental policy stringency

To measure environmental policy stringency and apply this measure across countries and time yields a common issue in political science, prevalent in quantitative studies. The multidimensionality and complexity of environmental regulation, and the variation in the reality that this study aims to help explain is not easily captured in one single variable. This section will present the dependent variable, and discuss its merits and its measurement problems. The dependent variable selected for this study is the Environmental Policy Stringency indicator (EPS) by OECD, a proxy for aggregated environmental policy stringency (OECD, 2016, p. 4). It is a country-specific internationally comparable index, constructed using 14 environmental policy instruments related to climate and air pollution (OECD, 2016, p. 3). The EPS indicator is useful as it enables the measure of a precise concept. It might not refer to the entire set of properties of environmental policies, but it is a good indicator of a *specific* set of properties which allows for empirically grounded investigation. The EPS takes into account the stringency of *implemented* policies over the course of a year (Galeotti et al., 2020, p. 8). The variable can therefore measure a change in the status quo: an increase or decrease in the strictness of environmental policies.

The EPS indicator which is discussed in the OECD working paper by Botta and Koźluk (2014) is the preliminary indicator to the variable used in this analysis. The introduction of BRIICS in 2015 involved some minor modifications to the indicator, but the extended EPS indicator which is used here is highly correlated with the original one (OECD, 2016, p. 10). The indicator is scored on a 0 to 6 scale, where 6 denotes the most stringent policies. The policy instruments included have been selected in attempt to cover both marked and non-market approaches to environmental policies. The aggregated structure of the EPS index is illustrated in appendix B.

The indicator is derived through a collection of information on selected environmental policy instruments, namely environmentally related taxes, renewable energy, and energy efficiency support, further categorised into market-based an non-market based policies. For each latent instrument, stringency is defined as "*a higher implicit or explicit price placed on the relevant environmental damage produced by firms or consumers*" (OECD, 2016, p. 4). Policies can change the costs of pollution in different ways. Environmental policies can directly raise the costs of polluting behaviour. These policies are often considered more stringent the higher the taxes or the stricter

the standards (OECD, 2016, p. 4). For federal countries where some key instruments are applied at the sub-national levels (such as in the US and Germany), the national indicator is a weighted average of regional policies where weights are the share of each region in electricity consumption/production (OECD, 2016, p. 5).

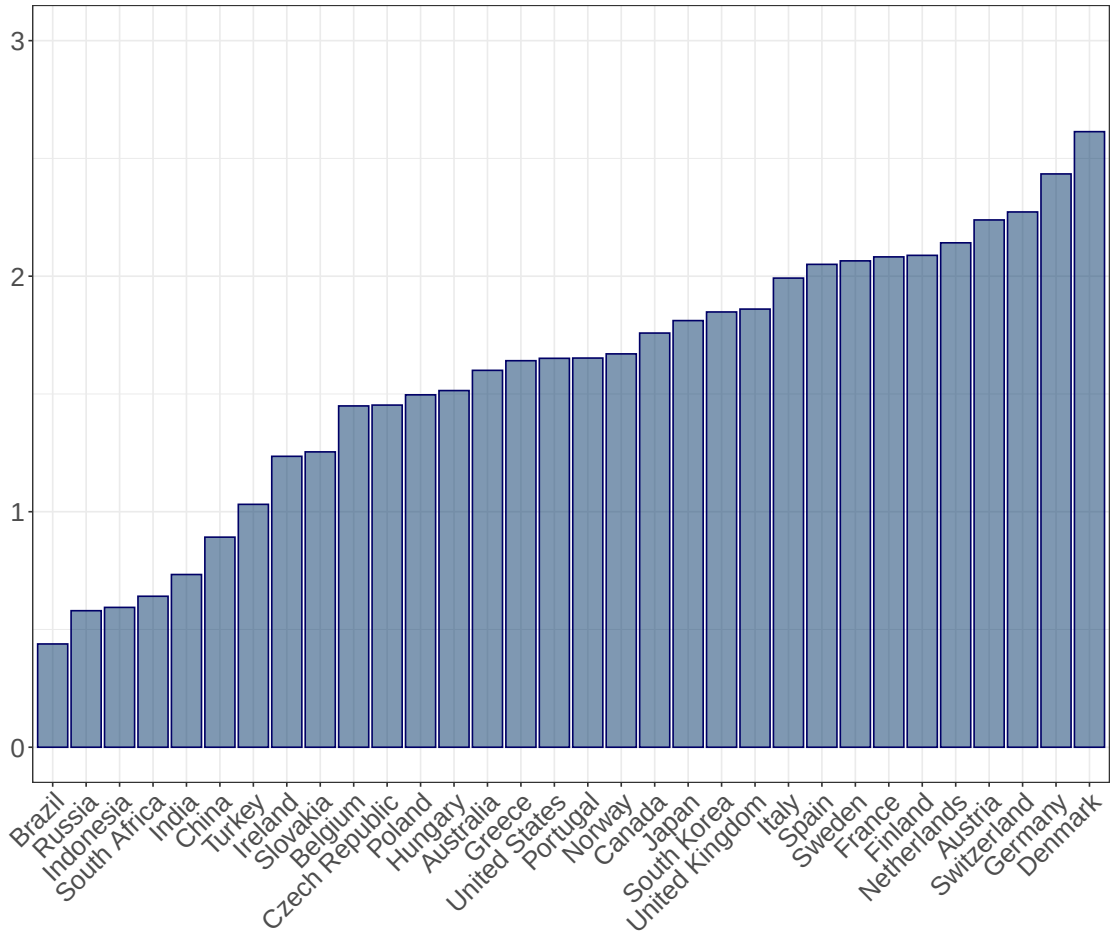

Figure 5.1: *Average environmental policy stringency across countries from 1990-2012*

The EPS indicator is a simplification of the multidimensional reality of environmental policies, which makes it beneficial for coding environmental policies across countries, and it enables comparison over time (Botta & Koźluk, 2014, p. 10). To facilitate this comparison, the number of dimensions of activities, environmental media, policy instruments and pollutants is reduced. The indicator focuses mainly on air and climate policies, which means that the measure overlooks other important areas such as biodiversity, water, and waste (OECD, 2016, p. 4). This is unfortunate as there are countries that in fact have more stringent forest protection policies or water protection policies compared to policies that focuses on emission limits or renewable energy. Thus, the indicator can create a fallible presentation of the stringency of environmental policies in certain countries. That said, it is still a broad thematic measure of environmental

policies (Galeotti et al., 2020). The same issue of multidimensionality goes for policy instruments, where important instruments such as voluntary approaches are excluded. Again, some countries have a high share of certain policy tools (Requate, 2005, p. 176). For instance, Japan has a high share of voluntary approaches which is a policy instrument not included in the EPS indicator (OECD, 2016, p. 9).

5.3 Operationalising veto points

The operationalisation of veto points consists of two separate indexes, namely the checks-and-balances index (***CHECKS***) and the Political Constraint Index (***POLCON V***). I include two variables to operationalise different aspects of the veto point concept as defined in the theory chapter. CHECKS counts the number of veto points in a political system, and adjusts for whether these veto players are independent of one another. POLCON V captures the constraint that any one actor within a polity faces when pursuing to change policy. The main concern for this section is whether the chosen indicators adequately captures the concept of veto points as presented in *this study* (Adcock & Collier, 2001, p. 533).

Referring to the systematised concept of veto points outlined in the theory chapter, there are two aspects of the veto point approach that the operationalisations should measure: the number of independent veto points over policy outcomes, and the distribution of the preferences of these veto points. After describing the indexes in more detail, and discussing some relevant issues, this section will demonstrate why these measures cover these concerns rather well. The combination of CHECKS and POLCON V is practised in several studies e.g., W. Henisz (2000); S. P. Singh and Dunn (2013); Heller, Kyriacou, and Roca-Sagalés (2014). Withal, when using these measures for capturing the concept of veto points there are pitfalls with ramifications for the empirical analysis. These will be discussed in section 5.3.1.

CHECKS

CHECKS is collected from the Database of Political Institutions (2017 version, the variable used in this analysis is often referred to as CHECKS1 in literature). CHECKS equals one if the legislative Indices of Electoral Competitiveness (LIEC) or the Executive Indices of Electoral Competitiveness (EIEC) is less than 6. Where legislatures are not competitively elected only executives wield a check.[1] In countries where LIEC and EIEC is less than 6: the value is incremented by one if there is a chief executive, it is incremented by one if the chief executive is competitively elected, and lastly it is incremented by one if the opposition controls the legislature. In presidential systems

[1] Coding for these indices are elaborated in Scartascini, Cruz, and Keefer (2018, p. 14).

CHECKS is incremented by one for each chamber of the legislature. The exception here is if the president's party has a majority in the lower house and the electoral system has a closed list system. It is also incremented by one for each party coded as allied with the president's party and which has an ideological orientation closer to that of the main opposition party than to that of the president's party. Ideological orientation is measured using a left-right-centre dimension (Scartascini et al., 2018, p. 19). In parliamentary systems CHECKS is incremented by one for each party in the government coalition as long as the parties are needed to maintain a majority, and for every party in the government coalition that has a position on economic issues closer to the largest opposition party than to the party of the executive. If there is a closed rule in place, the prime minister's party is not counted as a veto point (Scartascini et al., 2018, p. 19). Federal sub units and the judiciary is not included as veto points in this variable. The range of the variable is from 0-18.

POLCON V

POLCON V is designed by Henisz (2000), and measures to what extent political structures constrain policy decisions. Similarly to CHECKS, the coding of POLCON V begins with assigning the lowest score to the country with the fewest veto points (Hoffmann, 2010, p. 57). This is achieved by identifying the number of independent branches of government with veto power over policy change in each country (W. J. Henisz, 2015). Branches of government include executive, lower and upper legislative chambers, judiciary, and sub-federal institutions (W. J. Henisz, 2004, p. 10). The preferences of each of these branches and the status quo policy are then assumed to be independently and identically drawn from a uniform, unidimensional policy space (W. J. Henisz, 2004, p. 10). POLCON V is then modified to include the extent of alignment (or independence) across branches of government. This step of the construction enables the index to account for the increase in capacity for policy change when there is alignment across branches, and the political constraints is reduced when the alignment increases (Heller & McCubbins, 1996). When adding a new veto point, POLCON V therefore accounts for the congruence of this veto point with existing veto points. The variable has a scale from 0-1.

5.3.1 Validity and measurement issues

This section will discuss the disadvantages regarding the two variables. CHECKS assumes a linear relationship between the number of adjusted veto points and the degree of constraints on policy change. For instance, the number of adjusted veto points increases linearly when a party is added to a ruling coalition regardless of the relative size of these parties (W. J. Henisz, 2004, p. 9). An additive index might also overstate

the veto power of some institutions and lessening the veto power of others. Giving some institutions more veto power than other institutions yields conceptual difficulties. Ganghof (2003, p. 7) specifies that a careful establishment of links between theory and measurement is a major concern in quantitative veto point-studies, and that including weighted measures of veto points have until now resulted in the ranking of countries diverges from one index to another. Quantitative explanations can therefore be too easy to construct, as it allows for adapting the explanatory variable to the dependent variable in question (Ganghof, 2003, p. 8). To clarify, it is plausible that CHECKS violates the assumption of all veto points having equal veto power by linearly increasing the number of veto points. As discussed in the theory chapter, this assumption is however problematic due to equivalent veto power over a policy is rarely the case. Withal, theoretical guidance for coding proportionate veto power does not exist, so including a weighted measure is not necessarily a better solution to this issue (Madden, 2014, p. 578).

An additional issue with this additive index is that the adjustments for preference alignment are accounted for by adding one to or subtracting one from the number of veto points. For instance, CHECKS is incremented by one for every party in the government coalition that has a position on economic issues closer to the largest opposition party than the executive party. Moreover, as prefaced in the theory chapter, stability will not decrease with an increase in the number of veto points if veto point preferences are unaccounted for. This measure predicts a strict increase in this scenario, which contradicts this theoretical assumption (Nalepa & Xue, 2018, p. 5). It can be argued that POLCON V is constructed with an improved method for adding a new veto point within a polity, and accounting for its preferences.

In his (2004) article, Henisz presents POLCON V as an alternative measure to CHECKS, as it is a spatial model of political interaction. POLCON V is adjusted for the party affiliation of the executive, the size of the legislative majority, and the fragmentation of the state. According to Nalepa and Xue (2018, p. 7) the index therefore better captures the relative distance of veto points within a country.[2] This is because W. J. Henisz (2002) first assumes that preferences of the branches are independent and identical, distributed over a unidimensional policy space. Then, this assumption is accounted for by taking into account the partisan affiliation of the executive, the size of the legislative majority, and the fragmentation of the legislature (whilst retaining the assumption of unidimensional policy) (Nalepa & Xue, 2018, p. 6). By including preferences in this manner, W. J. Henisz (2002) accounts for the veto points' congruence (Hoffmann, 2010, p. 59). To compare countries on their POLCON V score is

[2]Nalepa and Xue (2018) is not a published scientific article.

however inaccurate because the index does not take into account the moderation or extremity of veto points. It should therefore not be used to compare countries cross-sectionally, but rather compared to itself across time (Nalepa & Xue, 2018, p. 6). An obstacle for cross-national analysis also applies to CHECKS. To compare countries on their respective CHECKS value is faulty because systems with more veto points do not automatically have more policy stability than systems with less veto points (Nalepa & Xue, 2018, p. 3). Tsebelis remarks on the POLCON V variable created by Henisz, and emphasises how the "empirical correlation between 'political constraints' and either the number or the distances among veto players is questionable" (2002, p. 205). According to Tsebelis(2002), one reason for this is that the judiciary does not always have veto power, and the notion that federalism seems to be counted twice as it is included in the second chamber of a legislature (Tsebelis, 2002, p. 205). The inclusion of the judiciary is is a valid point, and was discussed in the theory chapter. This thesis acknowledges federal sub units and the judiciary as veto points that impact environmental policy stringency. (W. J. Henisz, 2002, p. 364). That said, Tsebelis supports the use of POLCON V compared to a few other operationalisations: "I find the intellectual, conceptual, and methodological affinity with the latter [POLCON V] to be much stronger (and I have used it when the time period or the spread of countries was much larger than my own dataset)" (Tsebelis, 2011, p. 12).

To conclude, the indexes are not flawless operationalisations of the veto point theory. However, in combination they measure the concept presented in theory well, and they also yield several benefits individually. CHECKS is an apt proxy for the number of veto points in a polity, corresponding to the institutional veto point theory of Huber et al. (1993). POLCON V arguably enhance the operationalisation of the actors preference alignment, it therefore better portrays the actual constraints on the policy makers and veto point congruence. The measures together, and on their own, are therefore considered apt to test the theory of veto points on environmental policy stringency. Also, the country and year coverage of the two variables is exceptional. Both variables are available for nearly all of the observations available for the EPS indicator.

5.4 Control variables

Are systems with more veto points less able to adopt and implement environmental protection policies with higher level of stringency? The thesis will test this assumption, but as several qualitative studies show, many political factors in addition to institutional characteristics determine environmental policies (Fiorino, 2011). Control variables are included and held constant to reveal the controlled effect of veto points on environmental policy stringency (Christophersen, 2013, p. 58). This section will

first describe the operationalisation of corruption, followed by the remaining control variables chosen for the regressions. I control for the most established political factors in addition to two control variables for economic factors. Table 5.1 on page 39 summarises the variable descriptions including which data set they are collected from and their temporal coverage.

5.4.1 The moderator: corruption

The impact of corruption on environmental policy stringency was discussed both in the literature review and theoretical approach. It is proved a crucial political factor in explaining variance in the strictness of environmental policies (Pellegrini, 2011, p. 101). ***Corruption*** is therefore expected to be a strong predictor for environmental policy stringency. Damania (2002) writes how environmental regulations typify a large class of activities in the public sector where government agencies are required to monitor the degree of compliance. The presence of corruption is thus expected to negatively impact environmental policy stringency implementation. Corruption levels are also expected to impact the strength and/or direction of the relationship between the main explanatory variables and the dependent variable. It therefore also acts as a moderator in the regressions.

The variable is collected from V-Dem. It is an index measuring *political corruption* (v2x_corr). The index reflects how pervasive political corruption is in the respective country (Coppedge et al., 2021, p. 296). It is an index with a directionality from low to high, from less corruption to more corruption. "The corruption index includes measures of six distinct types of corruption that cover both different areas and levels of the polity realm, distinguishing between executive, legislative and judicial corruption. Within the executive realm, the measures also distinguish between corruption mostly pertaining to bribery and corruption due to embezzlement. Finally, they differentiate between corruption in the highest echelons of the executive at the level of the rulers/-cabinet on the one hand, and in the public sector at large on the other. The measures thus tap into several distinguished types of corruption: both 'petty' and 'grand'; both bribery and theft; both corruption aimed and influencing law making and that affecting implementation" (Coppedge et al., 2021, p. 296).

5.4.2 Political and economic control variables

It is imperative to control for the effect of the level of ***democracy***. There is statistical evidence of the positive effect of democracy on the degree of environmental commitment of countries (Neumayer, 2002). It is an important control variable as the sample includes countries that has transitioned from autocracy to democracy in the span of years included in the data (Indonesia). The variable controlling for the effect of democracy

on environmental policy stringency is the Electoral Democracy Index collected from V-Dem. This is the definition of the measure as written in the code book (variable name is v2x_polyarchy): "The electoral principle of democracy seeks to embody the core value of making rulers responsive to citizens, achieved through electoral competition for the electorate's approval under circumstances when suffrage is extensive; political and civil society organisations can operate freely; elections are clean and not marred by fraud or systematic irregularities; and elections affect the composition of the chief executive of the country. In between elections, there is freedom of expression and an independent media capable of presenting alternative views on matters of political relevance. In the V-Dem conceptual scheme, electoral democracy is understood as an essential element of any other conception of representative democracy — liberal, participatory, deliberative, egalitarian, or some other" (Coppedge et al., 2021, p. 43). The scale interval is from low to high (0-1). Regressions will be estimated based on a sample consisting only of democracies. This control variable will solely be included in the regressions estimated on the sample containing all countries. A continuous measure of democracy is chosen to measure the degree of democracy (Coppedge & Reinicke, 1990, p. 52). The sample of democracies is defined using a dichotomous measure of democracies from the Bjørnskov-Rode regime data (Bjørnskov & Rode, 2019).

Knill, Debus, and Heichel (2010) find that EU membership increases the number of policies enacted progressively. To control for ***EU-membership*** is therefore important as both samples include several EU-members and non-members. Knill et al. (2010) tested this correlation on a dependent variable operationalised as the number of environmental policies adopted. There is however reason to assume that membership status will also impact policy stringency as the EU requires member states to adopt environmental policies, and also regulates the stringency of these policies (Vogel, 2003, p. 573). The variable is therefore assumed to have a positive effect on environmental policy stringency. The variable is a dichotomous measure of EU-membership = 1, and no membership = 0.[3]

Green presence is included as a control for the presence of environmentally oriented parties' potential impact on environmental policy stringency.[4] This is relevant as green parties might work as a "positive veto point" in the sense that they are likely to approve more stringent environmental policies or even strive for more strict policies. Mourao (2019) finds that higher shares of parliamentary seats settled by Green Parties

[3]I used the information on European Union (2021)- website to determine status of EU-membership across the temporal coverage of the data set.

[4]The name green presence is sourced from Madden (2014). As the variable does not directly measure green parties, green presence is considered a good label.

tended to be observed in countries with the most significant reductions in estimated levels of different pollutant gases. Kayser and Rehmert (2020, p. 221) demonstrate that shifts in the coalition-inclusion probabilities of environmental parties strongly predict environmental policy change. They use the EPS as a dependent variable. The variable is therefore assumed to have a positive effect on environmental policy stringency. Mourao (2019, p. 992) focuses on Green Parties (parties belonging to the ECO-party family), however, as he points out "nowadays, almost all parties' manifestos in western democracies include environmental concerns". The variable included is therefore rather based on *the level of saliency* that coders have agreed that environmental protection holds for the parties in question. This variable is constructed using the V-Party dataset. The *v2pasalie_12* measures whether coders rank environmental protection as salient for parties to gain and keep voters (0= no, 1= yes). I set this variable to 0.5 or higher. In line with Madden (2014, p. 579), I restricted the measure to include the percentage of seats (*v2paseatshare*) occupied by parties with environmental protection emphasis higher than 0.5 in the lower house of a state's legislature (*v2pagovsup* =2 or =3). The value is estimated by adding together the seat share (the percentages are taken from the same whole) of parties with *v2pasalie_12* above 0.5. The variables used to construct the variable only holds observations for the respective parties each election year. To ensure more observations I therefore assume that the saliency of environmental protection and seat shares does not change for the parties during the election-period.

I also control for ***government polarisation***. This is considered necessary because greater polarisation in a party system is found to negatively impact policy adoption (Murillo & Martínez-Gallardo, 2007). It can be argued that this variable is rather a part of the theory because it can operationalise the concept of distance between preferences of veto points. Referring to the theory chapter, the polarisation of government parties is not part of the veto point framework as this would violate the aim of a holistic approach to the concept. This variable is operationalised based on the DPI dataset variable of *polariz*: "maximum polarisation between the executive party and the four principle parties of the legislature" (Scartascini et al., 2018, p. 19). The polariz variable from DPI has a large number of missing values. I therefore constructed a similar measure based on variables from V-Party (Lührmann et al., 2017). The ideological polarisation is measured using the respective parties' placement on the economic left-right scale. The parties included in the variable are the chief executive party, the three largest government parties and the largest opposition party (determined using *v2paseatshare* and *v2pagovsup* = 0, 1 or 3). For countries where elections are not competitive, the ideological polarisation is coded 0. The definition of competitive elections is based on the Bjørnskov-Rode regime data (Bjørnskov & Rode, 2019), equal to identifying democracies for the democracy sample. The variable is also coded 0 if

the chief executive party has an absolute majority. I used the DPI-variable *allhouse* to determine whether the party had absolute majority or not. I calculated the values by estimating the difference between the max and min value on the *v2pariglef* variable, after identifying the parties that met the criteria above. As with the green presence-variable there are only observations for the election years, so the same procedure of copying has been followed to provide more observations. The V-Party data registers changes in government composition, so one can assume that nothing changes between the registered years.[5]

Political factors are not the only explanations to variation in environmental policy stringency. I therefore control for two economic variables, namely ***GDP per capita*** and ***Trade openness***. The measure for wealth is the natural log of the countries' GDP per capita. It is measured in GDP per capita (Constant 2010 US$), and the variable is retrieved from the World Bank's World Development Indicators (World development indicators Washington, D.C.: World Bank Group., 2015). This variable is included because wealthier states may have more resources to take action on environmental change, and this can result in more stringent environmental policies (OECD, 2016, p. 8). The variable is therefore assumed to have a positive relationship with the dependent variable.

Trade openness has been incorporated in studies of economy-environment linkages, and is argued important because trade influences the domestic economy and therefore environmental behaviour (Bernauer & Koubi, 2009, p. 1361). It is important to include because countries with more open trade regimes tend to have stricter environmental regulations on average (Damania, Fredriksson, & List, 2003, p. 507). This analysis will not enable cross-country comparison, but this indicates that higher levels of trade openness can positively impact environmental policy stringency. The variable is also retrieved from the World Bank's World Development Indicators. The natural log has been taken to moderate the skewed distribution of both GDP per capita and Trade openness.

5.5 The statistical model

The variables are modelled with two-way fixed effects OLS regressions, with robust standard errors clustered by country. The model strategy is considered appropriate for several reasons. By including fixed effects on time and countries, the model removes the time-invariant confounding effects using only within-units variation (Mummolo & Peterson, 2018, p. 829). Because the countries in the data set are likely to differ

[5]I constructed both of these variable using both R-studio and Excel.

systematically from one another in ways that affect the outcome of environmental policy stringency, the unit fixed effects is included to produce an estimate of a variable's average effect within these countries over time.

Fixed effects regression will also ensure that the effect of veto points is estimated separately for each country. This is a methodological trade-off, because by choosing to only estimate within-variation, the model does not give the opportunity to explain between-unit variation (Mummolo & Peterson, 2018, p. 830). Referring to the discussion regarding POLCON V and CHECKS in section 4.3.1., the variables are not apt for cross-national inferences. To rely on within-estimation is therefore advantageous in this case, because estimating the between-effects would lead to unreliable results as the variables are not suitable for between-effects modelling. The fixed effects will ensure that countries with different formation of veto points is not compared to each other. Fixed effects will clean out much of the possible omitted variables if those omitted variables are fixed over time or fixed over cross-sectional units (Christophersen, 2013, p. 171). That is not to say that there are no other omitted variables out there which could belong to that idiosyncratic error. The control variables are included for the purpose of attempting to control for these effects. Still, one cannot be fully confident that all omitted variables are taken care of, and that the effect of veto points on environmental policy stringency is without bias of any kind. The models are estimated based on the following equation:

$$Y_{i,t} = \alpha_j + \delta_t + \beta X_{i,t} + e_{i,t}$$

The notations of i and t denotes units and time periods respectively. The α_j denotes the unit specific intercepts, whilst the δ_t denotes a dummy variable for each time period. β represents the regression coefficients where x is a vector of the independent time-varying variables described above. $e_{i,t}$ is the error term (Worrall, 2010, p. 184). All independent variables are lagged two years. In order to capture the impact of veto points on policy stringency it is reasonable that the institutional composition and preferences of veto points need to be in place before the policy recorded in the EPS indicator is implemented. This is the case for the control variables as well. It is theoretically important to have these variables exist before the changes in environmental policy stringency. The two year lag for the independent variables was chosen based on an estimation of the optimal lag in R (assessing AIC). The data has multiple observations per country, and data clustered this way present estimation problems because the error terms within a cluster are unlikely to be independent (Jackson, 2020, p. 318). I therefore cluster the standard errors by country.[6]

[6]The standard errors are clustered with the cluster.vcov function in R which uses the method by

The interaction term

H2 proposes that corruption is a moderator in the relationship between veto points and environmental policy stringency. The analysis will therefore include regression models with interaction terms. Models with interaction terms can be written as follows:

$$Y = \alpha_0 + \beta_1 X + \beta_2 Z + \beta_3 XZ + e$$

Interpreting the unconditional marginal effect of veto points is meaningless if the regressions compute statistically significant interaction terms. This is because when Z correlates with X or XZ, we will get omitted variable bias if it is not included in the model. I will therefore estimate models without interaction terms first to study H1 before I investigate H2 (Brambor, Clark, & Golder, 2006, p. 66).

5.6 Data summary

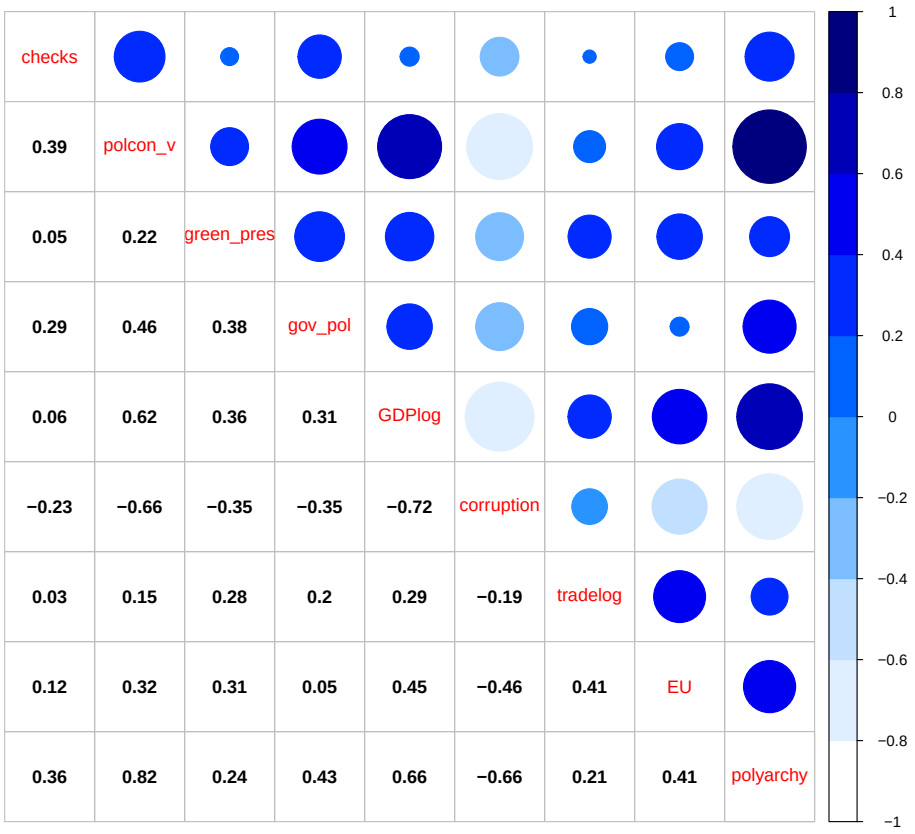

Figure 5.2: *Correlation matrix*

Cameron, Gelbach, and Miller (2011).

Figure 5.2 shows a graphical display of a correlation matrix which highlights the most correlated independent variables in the data set. Positive correlations are a darker shade of blue whilst negative correlations are displayed in lighter shades of blue. The colour intensity and size of the circle is proportional to the correlation coefficients. A few circles requires further discussion.

Firstly, CHECKS and POLCON V have a moderate, positive correlation. They therefore seem to represent partly the same concept. The correlation is however relatively small, only 0.39, so the indicators have variation of their own when compared to each other. This fits the purpose of including the two variables as they should measure different aspects of the veto point concept. Secondly, POLCON V correlates to a higher degree with GDPlog, corruption, and polyarchy. A correlation plot identifies the correlation or bivariate relationship between two independent variables whereas the VIF-test is used to identify the correlation of one independent variable with the entire group of independent variables. The results from the correlation matrix will be accounted for in the analysis, and I will perform the variance inflation factor(VIF)-test in the analysis.[7]

[7]Additional data description, summary, and visualisation can be found in the appendixes.

Table 5.1: *Summary of variable descriptions*

Concept	Operationalization	Original data set and temporal coverage	Variable name in analysis	Type of variable
Environmental policy stringency	Aggregated index on air and climate policies.	EPS/OECD: 1990-2012/2015	Stringency	*Low to high* *Scale:* 0-6
Fragmentation/veto points	The constraints that an actor faces when attempting to change policy.	The POLCON Dataset 1960-2015	POLCON V	*Low to high* Scale: 0-1
Fragmentation/veto points	Counts the number of veto points in a country.	DPI 1975-2015	CHECKS	*Low to high* Scale: 0-18
EU-membership	A dichotomous measure of EU membership = 1 or no membership = 0.	Constructed using EU (2020) website	EU	Binary 0/1
Level of democracy (polyarchy)	"To what extent is the ideal of electoral democracy in its fullest sense achieved?"	V-Dem 1900-2019	Democracy	*Low to high* Scale: 0-1
Level of corruption	"How pervasive is political corruption?"	V-Dem 1900-2019	Corruption	*Low to high* Scale: 0-1
Green presence	% of seat share in the lower house of state legislature with high environmental saliency	Constructed using V-Party 1990-2012/2015	Green presence	*Low to high* Scale: 0-25
Government polarisation	The maximum difference between government parties' placement on the left-right scale	Constructed using V-Party 1990-2012/2015	Government polarisation	*Low to high* Scale: 0-5.145
Wealth	GDP per capita (constant 2010 US$)	World bank 1960-2020	GDP	*Ratio*
Trade openness	Trade (% of GDP)	World bank 1960-2020	Trade openness	*Ratio*

Table 5.2: *Summary of country coverage*

Country	Temporal coverage	Dichotomous regime classification
Australia	1990-2015	Democracy
Austria	1990-2012	Democracy
Belgium	1990-2012	Democracy
Canada	1990-2015	Democracy
Czech Republic	1990-2012	Democracy
Denmark	1990-2012	Democracy
Finland	1990-2012	Democracy
France	1990-2015	Democracy
Germany	1990-2015	Democracy
Greece	1990-2012	Democracy
Hungary	1990-2012	Democracy
Ireland	1990-2012	Democracy
Italy	1990-2015	Democracy
Japan	1990-2015	Democracy
South Korea	1990-2015	Democracy
Netherlands	1990-2012	Democracy
Norway	1990-2012	Democracy
Poland	1990-2012	Democracy
Portugal	1990-2012	Democracy
Russia	1993-2015	Autocracy
South Africa	1990-2015	Autocracy
Spain	1990-2012	Democracy
Sweden	1990-2012	Democracy
Switzerland	1990-2012	Democracy
Turkey	1990-2015	Democracy
United Kingdom	1990-2015	Democracy
United States	1990-2015	Democracy
Slovakia	1990-2012	Democracy
Brazil	1995-2015	Democracy
China	1990-2015	Autocracy
India	1990-2015	Democracy
Indonesia	1990-2015	Autocracy (1990-1998) Democracy (1999-2015)

Chapter 6

Statistical analysis

Empirically environmental stringency differ across time. This thesis seeks to answer the question of whether the concept of veto points is related to these differences. The results from the analysis will be presented in this chapter. In chapter 4 I formed two hypotheses. One states that based on previous research and theoretical expectations, veto points are likely to have a negative effect on environmental policy stringency. The other states that the relationship between veto points and environmental policy stringency is likely to be dependent on the levels of corruption.

Based on the data described in the previous chapter, I estimate in total 9 regression models.[1] All regressions aim to model the relationship between veto points and environmental policy stringency. 4 of these models are estimated on a sample consistent of solely democratic countries, whilst the remaining 5 are estimated on a sample incorporating both autocracies and democracies. When referring to figure 5.2 there is high correlation between POLCON V and democracy. This is accounted for by estimating regression models on the democratic samples, and I also estimate a regression without the *democracy* control variable where POLCON V is the main explanatory variable. Due to the alleged effects of democracy on environmental policy stringency, this acts as a robustness check for these results. Lastly, I include regression models which estimate the interaction effect between veto points and corruption on enviornmental policy stringency. The significance level is set to 0.05 which is the conventional significance level in the social sciences (Christophersen, 2013).

This chapter will first present the distribution of veto points over time, followed by the results of the regressions, a validation of the model assumptions, and lastly an inspection of marginal effects. The results show that neither operationalisation of veto points have large independent effects on environmental policy stringency. However, the

[1] All regression models are estimated using two-way fixed effects OLS regression with SE clustered by country. The regressions are estimated using the lm() function in R and factor variables for year and country.

model which includes an interaction term with corruption shows a large interdependent effect on the sample including all regime types. The marginal effects indicate that the effects of veto points on environmental policy stringency is highly dependent on corruption levels.

6.1 Formation of veto points over time

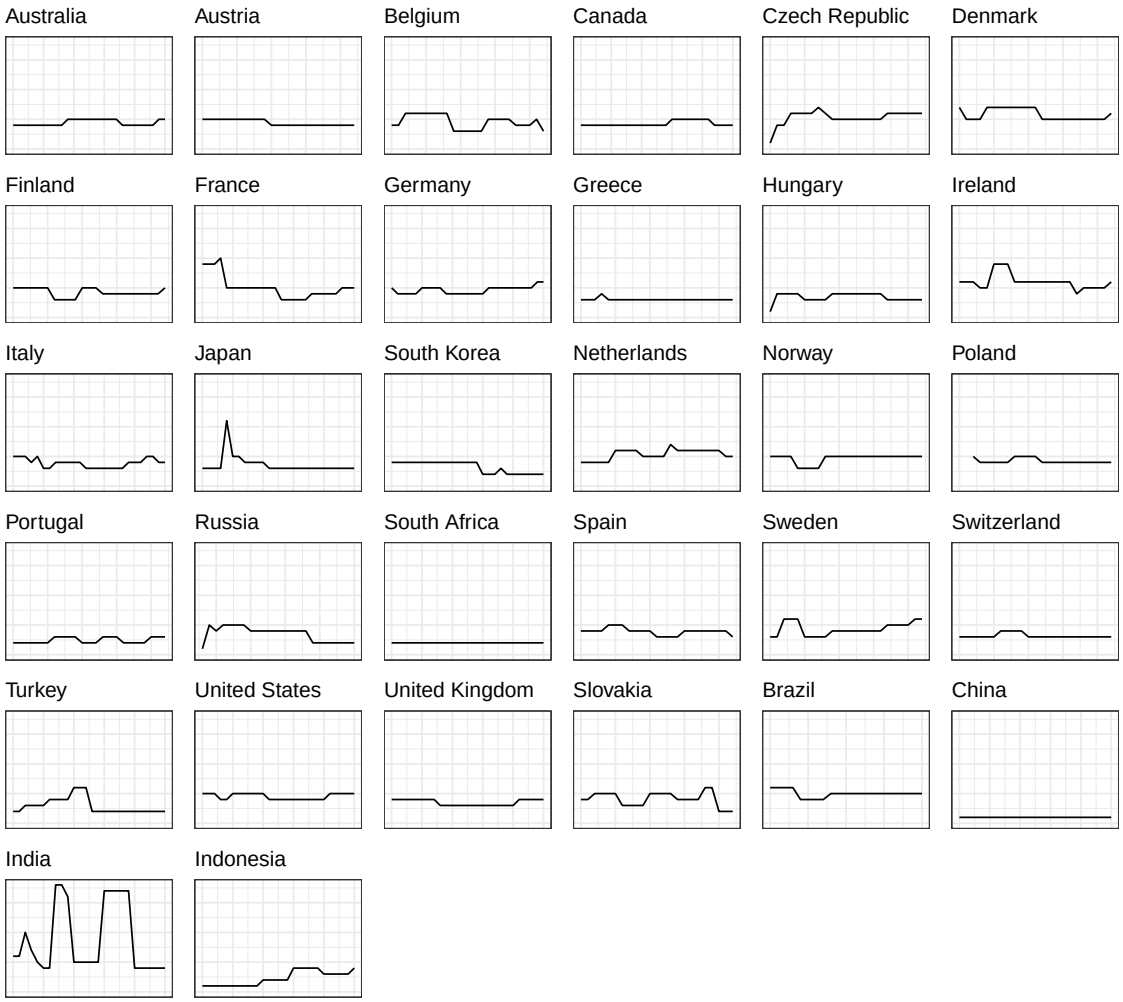

Figure 6.1: *Checks*: *veto points across time. Scale 0-18*

The plot shows the number of veto points as measured by CHECKS for all countries included in data from 1990-2012(2015). A few plots stand out in figure 6.1. The number of veto points in India varies drastically. The lowest number calculated is 4 (in 1996), whilst the highest number of veto points is 18 (in 1997).[2] China uniformly

[2]This is probably due to India being a parliamentary system, and CHECKS is therefore incremented by one for each party in the government coalition if it is needed for majority. In the 1996 election, a coalition government of 13 parties was formed (Chakravarty, 2019).

has the value of 1 veto point, whilst South Africa uniformly has the value of 2, and Switzerland has a stable distribution across time of either 3 or 4 veto points.

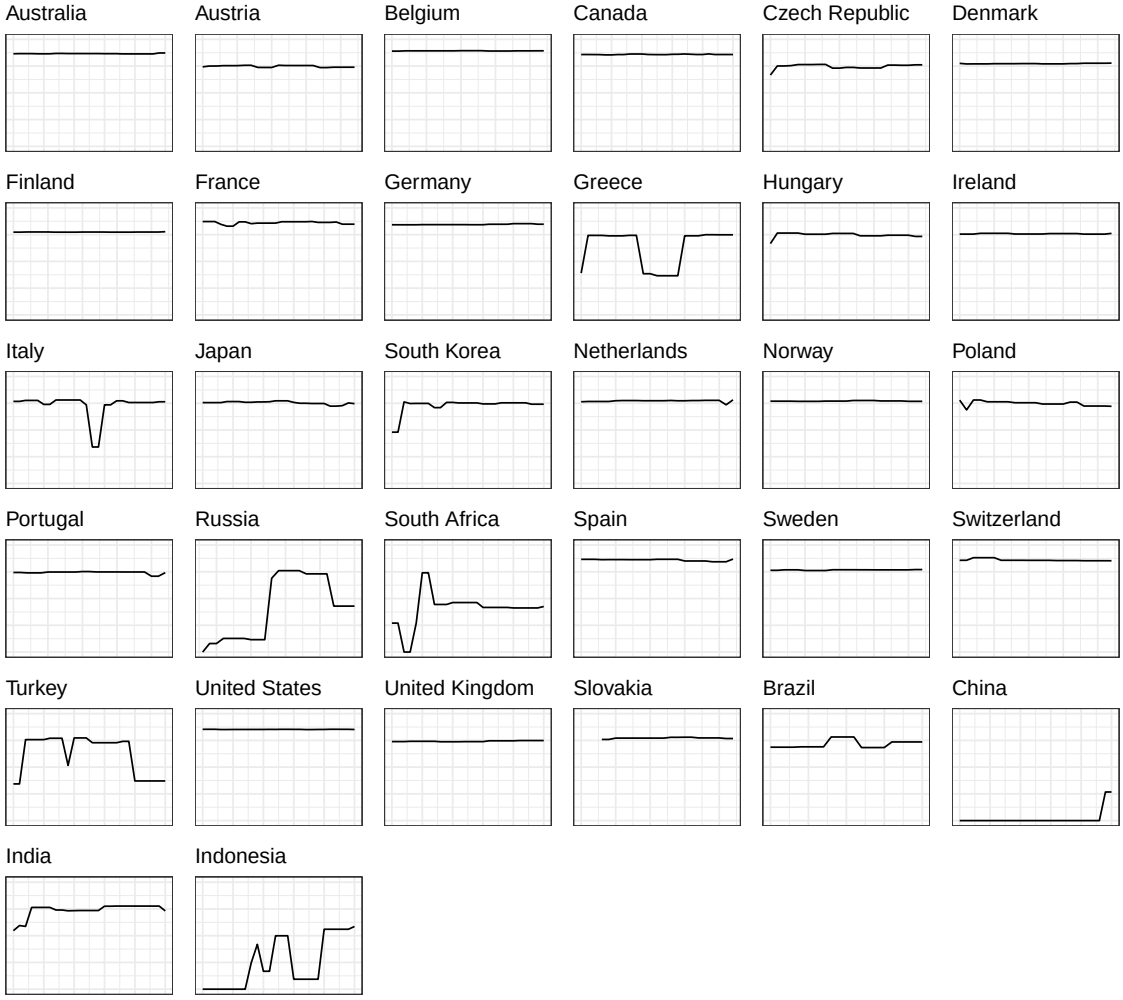

Figure 6.2: *Polcon V: veto points across time. Scale from 0-1*

The plot shows the presence of veto points as measured by POLCON V for all countries included in data from 1990-2012(2015). It has been suggested that inclusive democracy to harsh dictatorship are plausible interpretations of the divergent structures that POLCON V portrays across countries, and that this is one reason why it should not be used in analysis with between-effects (Nalepa & Xue, 2018). Figure 6.2 illustrates a very low score of political constraints for China across time (it is mostly at 0), and relatively high scores for the majority of democratic countries. However, there are more variation for POLCON V in countries which are deemed autocracies such as Russia, and South Africa. There is not too much variation across time for either country, and we can expect inferences to be drawn on countries with more variation.

6.2 Results

Table 6.1: *Regressions: checks*

	Dependent variable:			
	Stringency			
	(1)	(2)	(3)	(4)
Checks	−0.016	−0.008	−0.018	0.009
	(0.014)	(0.047)	(0.013)	(0.049)
GDP per capita	−0.503**	−0.509**	−0.119	−0.143
	(0.244)	(0.237)	(0.373)	(0.370)
Trade openness	−0.137	−0.137	−0.521	−0.516
	(0.403)	(0.402)	(0.361)	(0.353)
EU	0.344***	0.345***	0.310**	0.312***
	(0.115)	(0.114)	(0.121)	(0.119)
Green presence	0.009	0.009	0.007	0.007
	(0.012)	(0.012)	(0.011)	(0.011)
Corruption	−2.283**	−2.200**	−2.130**	−1.801*
	(1.038)	(1.041)	(0.905)	(1.044)
Democracy	−1.974**	−1.929***		
	(0.838)	(0.670)		
Government pol.	0.035	0.035	0.035	0.034
	(0.035)	(0.034)	(0.031)	(0.030)
Checks*corruption		−0.031		−0.109
		(0.163)		(0.168)
Constant	8.348***	8.335***	3.747	3.870
	(2.369)	(2.380)	(4.140)	(4.089)
Observations	700	700	622	622
R^2	0.857	0.857	0.866	0.867
Adjusted R^2	0.843	0.843	0.852	0.853
AIC	701.96	703.73	562.06	561.89
BIC	993.23	999.55	828.0354	832.30
Residual Std. Error	0.382 (df = 637)	0.382 (df = 636)	0.363 (df = 563)	0.363 (df = 562)
Note:				*p<0.1; **p<0.05; ***p<0.01

First and foremost, the original panel data contains 772 observations. Treating the data (forwarding the dependent variable 2 years) introduces missing values. The sample including all countries is therefore reduced to 700, and the sample for democracies has 622 observations. All estimated coefficients for CHECKS on environmental policy stringency are insignificant. According to these models, democracy has a negative effect on environmental policy stringency when the coefficients are estimated on a sample containing autocracies and democracies. EU membership has a positive and significant effect on the predicted values of environmental policy stringency across all models controlled for the remaining variables. Membership of the EU therefore increases the predicted value of environmental policy stringency according to these regressions. GDP is a significant predictor of environmental policy stringency in model 1 and 2. The coefficient of democracy in model 1 and 2 has a negative and significant effect on the variation in environmental policy stringency. Further, corruption is negative and significant in model 1, 2, and 3. When the interaction term between CHECKS and corruption is introduced in model 4 on the democratic sample, the effect of corruption is insignificant. The coefficients for green presence and government polarisation are insignificant across all models, and so are the interaction terms. The veto point measure of CHECKS therefore offers no evidence to support neither H1 nor H2.

R^2 measures the proportion of variation in the data that is accounted for. It only marginally varies across models estimating the relationship between CHECKS and environmental policy stringency. It is the exact same for model 1 and 2, meaning that including the interaction term does not account for more variation in the data. The Akaike information criteria (AIC) is a metric that penalises to include new terms to a model (Bruce & Bruce, 2017, p. 139).[3] The AIC is lower for model 3 and 4 compared to model 1 and 2. As these models are estimated on separate samples this does not indicate that model 3 and 4 are more adequate at describing the data. Between the models on the same sample, there is very little decrease in AIC, which means it does not indicate a lot better model fit without the interaction term. The Bayesian information criteria (BIC) is similar to AIC in that the lower the better. It does however give a stronger penalty for including additional variables to the model (Bruce & Bruce, 2017, p. 140).[4] The BIC is not altered significantly between the models on the same sample.

[3]AIC form:

$$AIC = 2P + nlog(RSS/n)$$

[4]BIC form:

$$BIC = \ kln(n) - 2ln(\hat{L}))$$

Table 6.2: *Regressions: polcon V*

	Dependent variable:		
	Stringency		
	(5)	(6)	(7)
Polcon V	−1.135***	−0.979*	1.156***
	(0.310)	(0.508)	(0.365)
EU	0.339***	0.338***	0.365***
	(0.115)	(0.111)	(0.105)
Trade openness	−0.217	−0.204	−0.351
	(0.323)	(0.335)	(0.334)
Government pol.	0.035	0.034	0.029
	(0.037)	(0.036)	(0.033)
Green presence	0.011	0.009	0.008
	(0.011)	(0.012)	(0.011)
GDP per capita	−0.249	−0.434**	−0.420**
	(0.188)	(0.188)	(0.179)
Corruption	−1.570	−2.766***	−0.813
	(1.476)	(0.909)	(0.691)
Democracy		−1.795**	−1.531***
		(0.762)	(0.501)
Polcon V*corruption			−3.715***
			(0.831)
Constant	5.150**	8.490***	6.860***
	(2.485)	(2.334)	(2.088)
Observations	700	700	700
R^2	0.855	0.863	0.871
Adjusted R^2	0.841	0.850	0.858
AIC	710.19	669.07	630.74
BIC	996.91	960.34	926.57
Residual Std. Error	0.385 (df = 638)	0.373 (df = 637)	0.363 (df = 636)
Note:			*p<0.1; **p<0.05; ***p<0.01

In model 5 POLCON V is significant and negative. Thus, the predicted value of environmental policy stringency decreases by the coefficient for each unit change in

POLCON V, assuming all other variables remain the same. This finding yields support to H1. Yet, as the model does not include control for the level of democracy, this effect cannot be relied on due to omitted variable bias. Model 6 corroborates this problem. The model includes the continuous measure of democracy as a control variable. When this variable is introduced, the effect of POLCON V declines in magnitude. The POLCON V coefficient is no longer statistically significant at $p > 0.05$. Model 7 provides a more nuanced picture. This model incorporates the interaction effect between veto points and corruption on environmental policy stringency. The model reveals that the effects of POLCON V and corruption on environmental policy stringency are seemingly interdependent.

When a model include an interaction term, both the marginal effect and the associated standard errors vary with the value of the other lower order-variable in the interaction term (Braumoeller, 2004; Friedrich, 1982). In section 6.4 I will plot the marginal effects of veto points on environmental policy stringency across different levels of corruption. Additionally, there is little substantial information in the separate coefficients for corruption and POLCON V in model 7. At best these coefficients represent statements about reality that only apply to a subset of the cases in the data set, and these coefficients will therefore not be interpreted (Braumoeller, 2004, p. 809). The coefficients of EU membership are positive and significant for all three models. The coefficient estimated for the relationship between GDP and environmental policy stringency is negative and significant in model 6 and 7, which contradicts the original predicted direction for this relationship. Trade openness, green presence, and government polarisation has insignificant coefficients across all models. Referring to the R^2, the explained variance in the data does not increase much when the interaction term is incorporated in the model. But, the AIC decreases from model 5 to 6 when democracy is controlled for, and further from model 6 to 7 when the interaction term is introduced. The BIC also decreases from model 5 to 6 to 7. This can indicate better model fit for model 7 compared to the two former models.

Table 5.3 displays the regressions estimated on the democratic sample with POLCON V as the main explanatory variable. In model 8, POLCON V does not have a significant effect on environmental policy stringency. Corruption has a negative and significant effect on environmental policy, whilst EU membership has a positive and significant effect. In model 9 the interaction term between veto points and corruption is introduced. Here, the coefficient of POLCON V remains insignificant. EU membership shows a positive and significant effect. Hence, EU membership is the only variable portraying significant effects across all samples and model specifications. It therefore seemingly has a very robust positive effect on the stringency of environmental policy. Trade openness, green presence and government polarisation have significant effects across all model specifications and samples. Contrary to the models in table 5.2., the

AIC and BIC is lower in the model without the interaction term. The difference is however very small, so it is uncertain whether model 8 is a better model choice.

To conclude, model 7 shows a significant interaction effect between veto points and corruption, and the model lends support to H2. Model 5 give weak support to H1 as it shows a significant coefficient for POLCON V, but it is not a complete model.

Table 6.3: *Regressions: polcon V*

	Dependent variable:	
	Stringency	
	(8)	(9)
Polcon V	−0.258	0.335
	(0.211)	(0.488)
EU	0.313***	0.319***
	(0.121)	(0.122)
Trade openness	−0.512	−0.519
	(0.363)	(0.361)
Government pol.	0.033	0.033
	(0.033)	(0.033)
Green presence	0.007	0.007
	(0.011)	(0.011)
GDP per capita	−0.117	−0.126
	(0.373)	(0.370)
Corruption	−2.254**	−1.374
	(0.958)	(0.851)
Polcon V*corruption		−1.289
		(0.940)
Constant	3.837	3.456
	(4.152)	(4.063)
Observations	622	622
R^2	0.866	0.866
Adjusted R^2	0.852	0.852
AIC	564.01	564.79
BIC	829.99	835.21
Residual Std. Error	0.363 (df = 563)	0.363 (df = 562)
Note:	*p<0.1; **p<0.05; ***p<0.01	

6.3 Validation of the model assumptions

Can we trust the estimates of these regressions? There are four main assumptions for fixed effects regressions in order for the OLS to produce unbiased estimates that are normally distributed in large samples: 1) the residuals in the regression should have conditional mean zero, 2) for each entity the draws from the independent variables and residuals are independently and identically distributed from a joint distribution, 3) large outliers are unlikely, and 4) all the regressors must be linearly independent (absence of perfect multicollinearity) (Stock & Watson, 2012, p. 405).

I begin at the end, and apply the VIF-test for assessing multicollinearity. The correlation matrix in figure 5.2, displayed signs of independent variables correlating with each other. Multicollinearity is problematic as it can cause numerical instability in fitting regression equations (Bruce & Bruce, 2017, p. 155).

Table 6.4: *VIF-test*

	VIF
Model 1 (Checks)	2.25
Model 2 (Checks)	8.23
Model 3 (Checks)	1.9
Model 4 (Checks)	8.65
Model 5 (Polcon V)	6.79
Model 6 (Polcon V)	6.93
Model 7 (Polcon V)	3.73
Model 7 (Corruption)	6.69
Model 7 (Polcon V*Corruption)	2.63
Model 8 (Polcon V)	3.40
Model 9 (Polcon V)	2.29

l—ll

Table 6.4 shows the VIF-tests for the main explanatory variables in all regression models.[5] The VIF-tests do not show signs of multicolinearity for neither the POLCON V variable nor the CHECKS variable. There is no set thresholds for VIF-values that indicate multicollinearity. A rule of thumb is that a VIF-value above 10 indicates multicollinearity (O'Brien, 2007, p. 674). When an interaction term is added to a model there can be higher risk of multicollinearity, because the interaction term will correlate with the variables it consists of. I therefore included corruption and the interaction term from model 7 (Brambor et al., 2006, p. 70). There is little evidence of high Multicollinearity according to the VIF-test. Thus, I consider that the independent variables are not correlated in such manner that it causes problems for interpretation

[5]The VIF form:

$$VIF = \frac{1}{1 + R_2^i}$$

of the results.[6]

Figure 6.3 and figure 6.4 show diagnostic plots for two regression models: model 7 (the complete model that shows the significant interaction term on the sample with all countries), and model 3 (the complete model with CHECKS on the democratic sample).

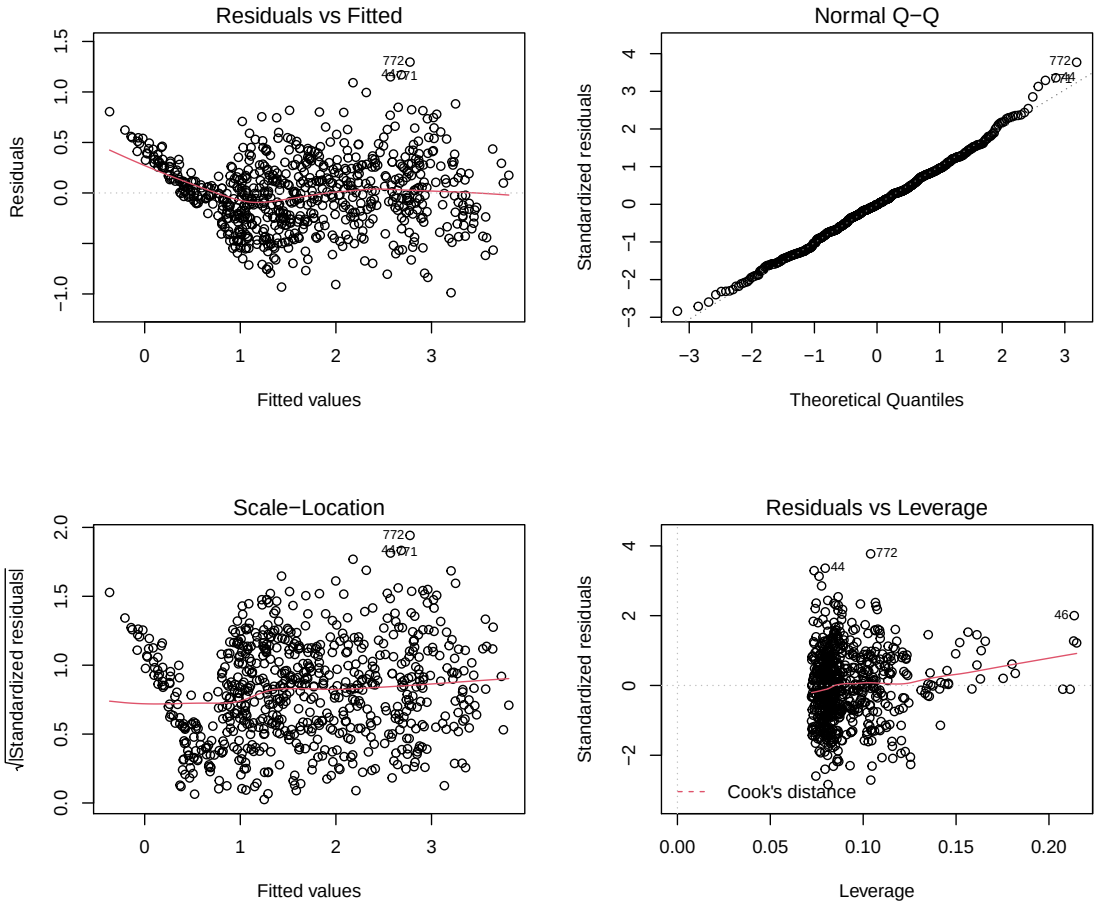

Figure 6.3: *Diagnostic plots for model 7*

The plot on the up-right corner in figure 6.3, 'Residuals vs Fitted', can be used to detect heteroskedasticity and non-linearity. It shows that linearity is violated for a share of the units. This is evident from the red line deviating from the dashed line on the left-side of the plot. Also, the residuals are not so randomly distributed from 0.5 and below. Evidence of heteroscedasticity in the residuals is however not obvious and will be inspected further in the 'Scale-Location' plot (Kim, 2015). That said, the deviant red line is distinct. Consequently, the plot indicates that the negative residuals of units with an environmental policy stringency score of 0.5 to 0 was not explained well by the model. To the right, the 'Normal Q-Q' plot informs whether the residuals are

[6]None of the models have control variables with a VIF-value above 10.

normally distributed or not. The residuals for the most part follow the dashed straight line rather well, and can therefore be deemed normally distributed (Kim, 2015).

The 'Scale-Location' plot shows whether the residuals are spread equally along the ranges of predictors. It can help validate the assumption of homoscedasticity, and pattern among the residuals. The assumption of homoscedasticity holds when the red line is horizontal with equally (randomly) spread residuals (Kim, 2015). The residuals from 1 and onwards appear randomly spread across a horizontal line. However, similar to the pattern in the 'Residuals vs Fitted' plot, the residuals with a predicted environmental stringency level below 0.5 has high variance. There is a clear pattern among these residuals, as it follows the similar "tail" to the left of the plot. The red line is fairly horizontal however, which indicates that the spread of the residuals is *roughly* equal at all fitted values. This can indicate homoscedasticity.

The 'Residuals vs Leverage' plot can help detect influential cases. The spread of the standardised residuals should not change as a function of leverage (the x-axis). When residuals are outside of the Cook's distance (illustrated with a red dashed line), they can be categorised as influential to the regression results (Kim, 2015). The plot in figure 6.3 does not show the Cook's distance line and the cases should therefore be well inside the line. The numbered residuals are classified as extreme cases. The cases prevalent across all plots belong to Australia (year 2010 and 2011), Brazil (2012), and Indonesia (year 2007). Even though data has extreme values, does not mean they are influential cases (Kim, 2015). As none of the numbered residuals are outside of the Cook's distance line in the 'Residuals vs Leverage' plot, excluding these cases from the regression will evidently not influence the results too much.

Figure 6.4 shows the same diagnostic plots for model 3 (complete model with CHECKS estimated on the democratic sample). The plots show very similar patterns and tendencies as evident in figure 6.3 with the plots for model 7. The extreme cases in these plots belong to Australia (2011), Canada (2009), and Indonesia (1999). Again, according to the 'Residuals vs Leverage' plot, these residuals are not deemed to be highly influential for the regression results.

Both models seemingly have problems predicting the cases with a score on environmental policy stringency below the value of 0.5. To get unbiased estimates for these units there are several approaches available. One can log transform the dependent variable, or review the inclusion of control variables (Kim, 2015). I have decided to stick with these models. I do not see any evident omitted variables from a theoretical perspective, and a logarithmic transformation of indicators like the EPS, POLCON V, or CHECKS would complicate the interpretation of the results. These variables have several observations that are very low, and adding a minor number to these values might bias the results. There is seemingly no systematic differences ascribed to the samples, as the same patterns appear in both figures. Also, these plots do not take into

account the clustered standard errors by country. Robust standard errors account for heteroskedasticity in a model's *unexplained variation* (Stock & Watson, 2012, p. 406). The systematic variation evident in the "tail" to the far left of the 'Residuals vs Fitted' plot and 'Scale-Location' plot in both figure 6.3 and 6.4, can therefore be less problematic with clustered standard errors.[7] Yet, pursuant to the diagnostic plots, the models do not predict variation over time in a unit with lower environmental policy stringency well compared to units with stringency scores of 1 and higher, as the linearity for these predicted values in the 'Residuals vs Fitted' plots is questionable. The fixed effects estimators for the lower categories of the EPS indicator is therefore not assured to be unbiased. given all value the X variable takes on in either of the time periods for the single entity (unit intercept)

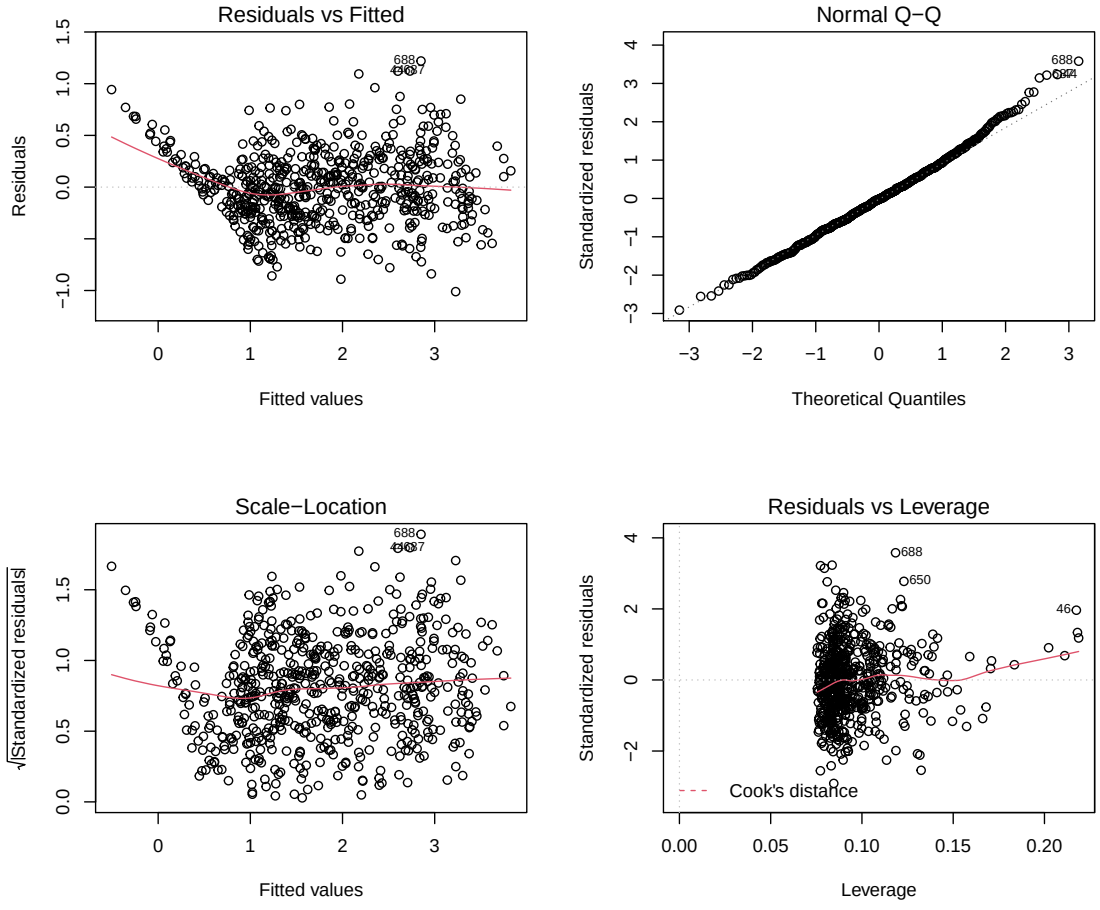

Figure 6.4: *Diagnostic plots for model 3*

[7] I also ran the Breusch-Pagan(BP)-test as the red line only gives a visual way of validating the assumption of homoscedasticity. The BP-test had a p-value of 1.235e-12, which is above the significance level of 0.05, and there is no evidence of heteroscedasticity in model 7. The BP-test for regression model 3 had a p-value of 1.439e-11, again, giving no evidence for heteroscedasticity.

6.4 Investigating marginal effects

An assumption when investigating the independent effects is that the relationship between the predictor variable and the response variable is independent of the other independent variables in the regressions (Bruce & Bruce, 2017, p. 153). According to the results regression model 7, veto points have an effect on environmental policy stringency, but this effect is dependent on the level of corruption. To determine the effect of the formation of veto points on the strictness of implemented environmental policies we therefore need to inspect the marginal effects of the interaction term. Figure 5.5 shows the effect of veto points, operationalised by POLCON V, on environmental policy stringency when corruption is set to minimum value (0.002) and maximum value (0.960).

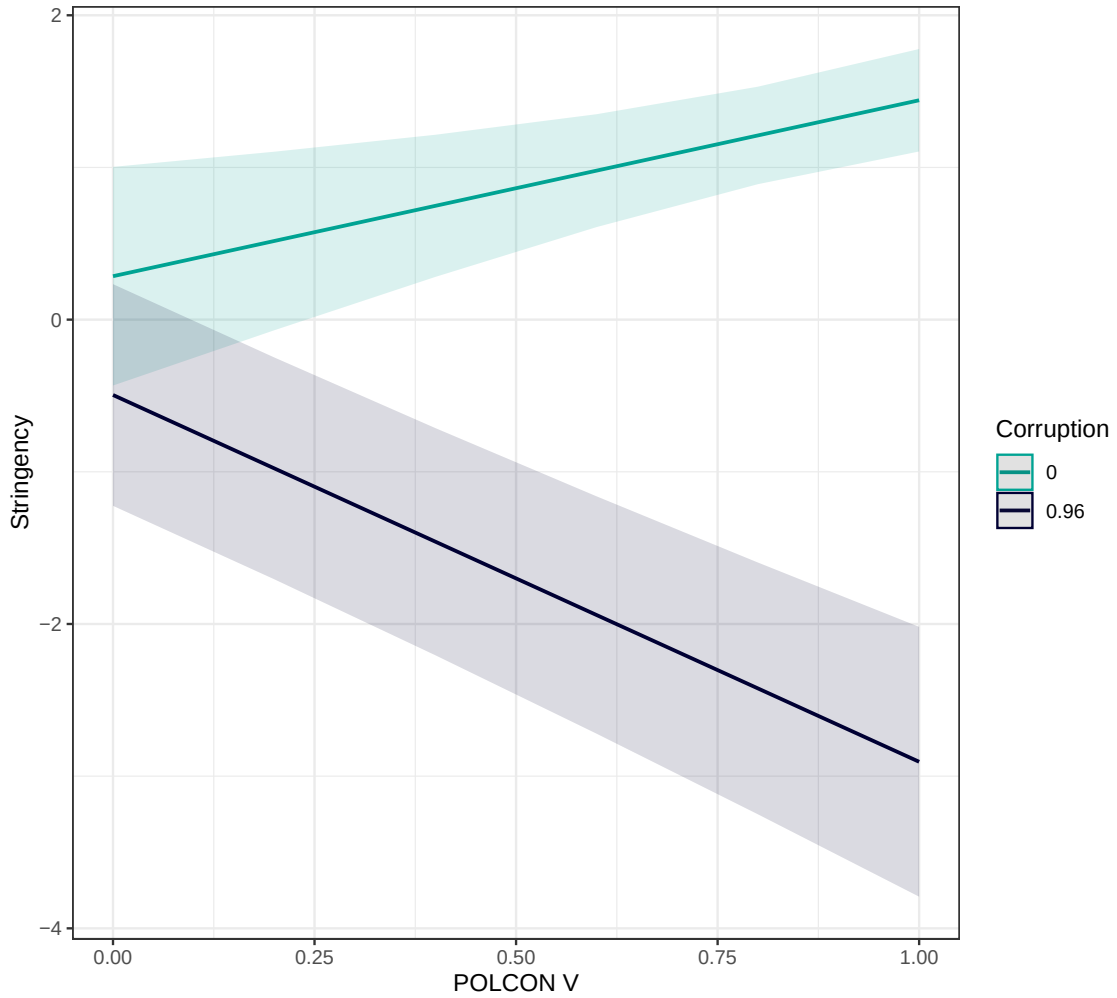

Figure 6.5: *Marginal effects for interaction term*

The plot shows the significant marginal effects from model 7 of veto points on environmental policy stringency conditional on corruption with 95 % confidence intervals

and robust standard errors. H2 is therefore supported on the sample that consists of all countries. The plot shows that the relationship between veto points and environmental policy stringency changes direction based on the corruption level. When the level of corruption is low an increase in the presence of veto points, i.e., more political constraints, is correlated with an increase in environmental policy stringency. When the level of corruption is high, an increase in the presence of veto points, i.e., more political constraints, is correlated with a decrease in environmental policy stringency.

To sum up, the results do not provide strong proof of a direct covariational relationship between veto points and the stringency of environmental policies. There is however evidence for a relationship between veto points and variation in environmental policy stringency that is conditional on corruption levels.

6.5 Hypotheses recap

Table 6.5: *Hypotheses recap*

Hypothesis	**Predicted effect**	**Evidence**
H1: A higher number of veto points (i.e., more political constraints) correlates with lower levels of environmental policy stringency.	Negative	Weak support
H2: Corruption has a moderating effect on the relationship between veto points (i.e., political constraints) and environmental policy stringency.	Exploratory	Support on sample with all countries

Chapter 7

Discussion

The direction and significance of the relationship between veto points and the strictness of environmental policies is now estimated. This chapter will discuss these results, reveal how they relate to what is already known, whether the results corresponds to the theoretical expectations, and answer the RQ1: *Does the formation of veto points impact the strictness of environmental policies?*

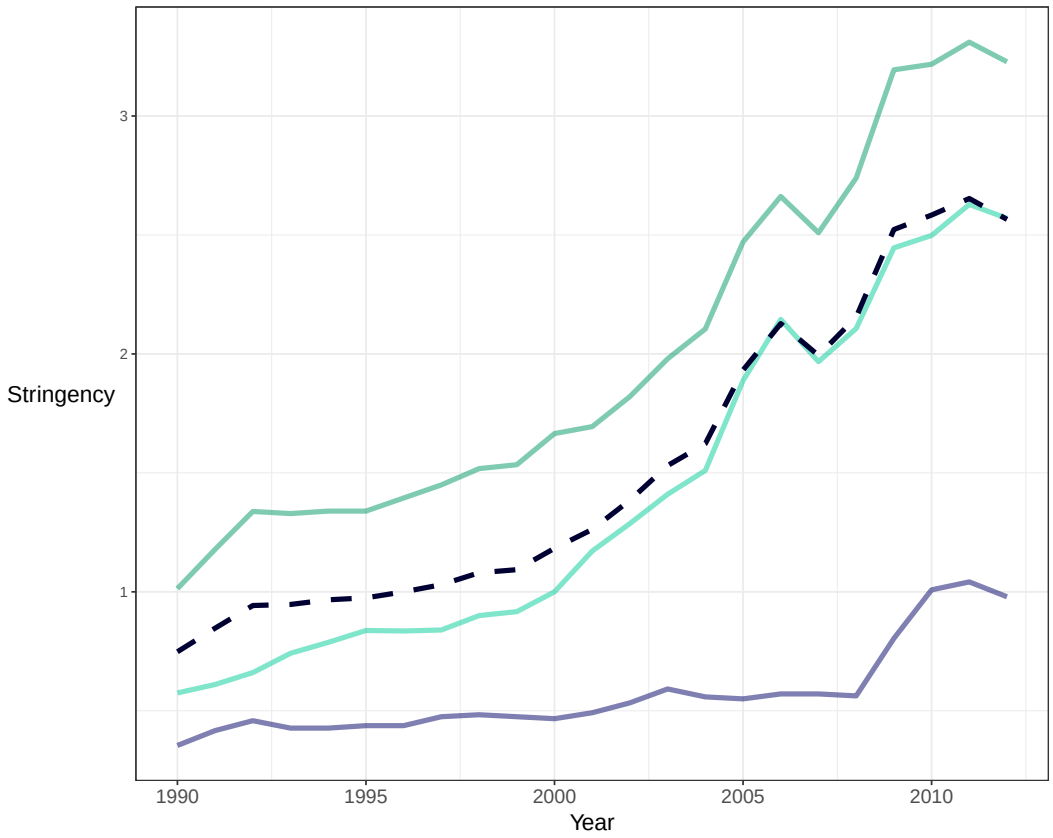

Figure 7.1: *Average stringency across time*

Figure 7.1 shows the steady increase of environmental policy stringency across time. The dashed-line shows the average strictness for all countries included in the data set

from 1990 to 2012. The other lines show the environmental policy stringency across time for the countries counted as leaders and laggards within the OECD, and lastly a separate line illustrate the average stringency of BRIICS.[1] The group of countries classified as laggards are close to the mean of all countries of the sample. The BRIICS clearly have a low average of stringency compared to the OECD member countries.

The thesis aims to help explain variation in the stringency of environmental policies across time. Can the formation of veto points contribute to an explanation as to why environmental policies increase or decrease in strictness over time? The structure of this chapter is as follows: I will unwrap the statistical results and discuss their implications. First, the direct relationship between veto points and the strictness of environmental policies, followed by the dependent relationship on corruption. The chapter concludes with a discussion on the limitations of this thesis.

7.1 The direct relationship

The significant coefficient of POLCON V in model 5 supports H1, as the increase in political constraints correlates with a decrease in environmental policy stringency. This model therefore supports the main idea demonstrated in the veto point theory, in that an increase in the presence of veto points reduces the probability of policy change (Tsebelis, 1995), and that the same constraints apply to increasing policy strictness (Mansfield et al., 2015). Yet, this model is likely to suffer from omitted variable bias. The model does not control for the effect of democracy on environmental policy stringency which is an important control variable, especially as Indonesia transitions from autocracy to democracy within the time period of the empirical data. Democratic institutions is argued to favour the development of commitments for addressing environmental problems (Pellegrini, 2011; Povitkina, 2018, p. 81). Inferences from this model therefore cannot be made with confidence. And H1 has very weak support in this analysis. Also, the magnitude of the veto point coefficient decreases in model 6 as the democracy control variable is introduced to the regression. Democracy can therefore explain parts of the variation in the effect of veto points on environmental policy stringency.

[1]The terms 'leaders' and 'laggards' stem from categorisations made by Vogel (2003). The groupings are based on the average of stringency as is depicted in figure 5.1: **Leaders**: The green line. Countries: Canada, United Kingdom, Netherlands, France, Switzerland, Germany, Austria, Finland, Sweden, Norway, Denmark, South Korea, Japan, Italy, Spain.
Laggards: The blue line. Portugal, Poland, Hungary, Czech Republic, Slovakia, Greece, Turkey, United States, Australia, Belgium, Ireland. **BRIICS**: The purple line. Brazil, Russia, Indonesia, India, China, South Africa.

7.1.1 The implications of *Checks* versus *Polcon V*

The coefficients stating the effect of CHECKS on environmental policy stringency are insignificant at $p > 0.05$. The significant effect of veto points on environmental policy stringency is captured by POLCON V. As stated in the methodology chapter, the variables adopted to operationalise veto points measure different aspects of the theoretical concept. I wanted to test different aspects of the veto point theory on the strictness of environmental policies. So, what does it mean that only POLCON V explains variation in environmental policy stringency, and CHECKS does not? There are two prominent distinctions in regard to these operationalisations. Firstly, POLCON V includes the relative distance in preference alignment between veto points (congruence) as it accounts for the relative position of a new veto point to the existing veto points. CHECKS on the other hand, does not include an adequate measure of preference alignment as it accounts for preferences by adding one veto point (the variable value is incremented by one) to the country/year observations. Secondly, POLCON V includes federalism and the judiciary as institutions with veto power, whilst CHECKS does not. Based on the results of this analysis, one can assume that these divergences between the two operationalisations is important when attempting to understand the role of veto points in explaining environmental policy stringency.

The insignificance of CHECKS proposes that according to this analysis, adding a veto point to or subtracting one from the number of veto points in a polity does not affect status quo of environmental policy stringency. As remarked upon in the methodology chapter, the pure institutional calculations of CHECKS does not take into account the relative distance between the preferences of veto points. This is in line with the institutional approach of veto point theory which was presented first by Huber et al. (1993), and adopted in several later studies (e.g., O'Reilly, 2005; Madden, 2014; Crespo-Tenorio, Jensen, & Rosas, 2014). The main argument of this approach is that one can expect an increase in the number of veto points to make policy adoption, i.e., increasing the strictness of policies, more difficult. There is therefore little support for the institutional approach in the results of this analysis. That said, one cannot claim that the insignificance of CHECKS indicates findings that are inconsistent with overall veto point theory. The insignificance of CHECKS is in fact rather consistent with the theoretical expectations put forward by Tsebelis (1995). This theoretical approach expects a lack of change in policy, i.e. increased stringency, with the addition of a veto point if the preferences are not accounted for (Tsebelis, 2002, p. 19). Hence, according to this analysis, the preferences of veto points can be considered important in studying the impact of the formation of veto points on the strictness of environmental policies.

One can interpret the direct effect as follows: adding a new veto point with di-

verging preferences to existing veto points in the policy-making process will hinder the opportunities for implementing environmental policies with increased strictness. However, as the direct relationship including the democracy variable is insignificant at a 0.05 significance level, this argument cannot be put forward with confidence. The direct effect also gives little substantial meaning as the effect is so dependent on the levels of corruption. This is further discussed in the next section which draws attention to the interplay with corruption. Yet, there is no significant interplay between CHECKS and corruption on environmental policy stringency either. Consequently, an interesting approach to future case studies investigating the change of environmental policy stringency over time, is to study the impact of the formation of veto points, in particular their diverging ideological preferences, on the variation of environmental policy stringency.

Furthermore, the fact that POLCON V includes federal sub units and the judiciary as veto points may suggest that these veto points are influential in impacting change in the strictness of environmental policies. This corroborates previous research where federalism is considered to have affect on environmental policy stringency (Fredriksson & Vollebergh, 2009). For instance, the example from India in the background chapter, section 2.1.1. Here, the federal state of Bihar opposed the national government's water policy which entailed increased central regulations on water resources (Mishra, 2013).[2] The inclusion of the judiciary is seldom indisputable, as scholars argue that the judiciary do not always have veto power (Tsebelis, 2002; Mansfield et al., 2015). Yet, in the case of increasing enviornmental policies, I argue that the judiciary have influence as it is found to play an important role in environmental governance in various countries (Sahu, 2005; Kramarz et al., 2017). For this thesis, it is not pertinent to establish whether a reason for the explanatory power of POLCON V is the inclusion of either federalism or the judiciary, as it falls outside of the research scope (a holistic approach to veto point theory). One main assumption in a holistic approach to veto point theory, is that veto points have generally equal average effect on policy adoption (Ganghof, 2003, p. 3). It can however be beneficial to qualitatively study the impact of different branches and categorisations of veto points, and *how* they impact the decision-making process leading to more stringent environmental policies. This can uncover mechanisms and further understanding of when different veto points execute veto power over environmental policies, and which veto points that are central in the policy-adoption processes.

[2]I could not find evidence on whether the opposition of the state of Bihar in fact impeded expansion of national regulations on water. Still, it serves as an *illustration* of how federal states can hamper the policy adoption of policies with increased regulations.

7.2 The influence of corruption

According to the results, interpreting the direct effect of veto points on environmental policy stringency makes little sense. The relationship seems to be highly dependent on the levels of corruption, and H2 is supported.

The study by Fredriksson and Vollebergh (2009), and the finding of interplay between federalism, corruption and environmental policy stringency proved relevant to this analysis and to establishing the relationship between veto points and environmental policy stringency. However, the direction of the effects in this thesis' analysis deviates from their theoretical model. The marginal effects show that when corruption levels is high, an increase in political constraints correlates with a decrease in environmental policy stringency. When the levels of corruption is low, an increase in political constraints correlates with a decrease in environmental policy stringency. (Fredriksson & Vollebergh, 2009) found that and increase in veto points will hinder the ability of organised interests and industry to bribe decision-makers, as it will accrue costs and be too expensive. It will therefore be higher levels of strictness in federal systems (Fredriksson & Vollebergh, 2009, p. 207).

It was argued in section 3.3.1 that the expectations put forward by Fredriksson and Vollebergh (2009) can be turned over. Perhaps it is too expensive for pro-environmental organised interests to bribe veto points, and therefore strictness is likely to decrease in systems with high corruption and increased presence of veto points. The results of this analysis points to the latter argument. But, as remarked upon, environmental policy-making is argued to have a pro-industry bias, and the pro-environmental organisations are not likely to cancel out the interests for less stringent policies (Woods, 2008, p. 260). It is therefore not an unassailable interpretation of these results. I will therefore discuss a few suggestions as to why the interdependent relationship looks the way it does.

7.2.1 Slow and steady wins the race?

The marginal effects depicted in figure 6.5 suggests that it is more likely with an increase in the strictness of implemented environmental policies when corruption is low and when there is an increase in the political constraints on policy makers. This contradicts the main argument of the veto point approach in this analysis, that more constraints on policy makers will make policy change more difficult. Moreover, that the same political environment that limits the feasibility of policy change, is also likely to limit the opportunities for increased stringency. In the case of increasing environmental policy stringency, one can therefore question the argument I put forward about the direct relationship, as the effect of variation in veto point formation is dependent on corruption levels. These implications will now be discussed.

Is a state's ability to produce policy change necessarily advantageous? Many veto points can lead to policy rigidity, which can make governments too stagnant in responding to crises, whilst few veto points can lead to excessive policy volatility (MacIntyre, 2001, p. 87). An advocate of status quo would not argue for the benefits of a political system with capacity for frequent change in policy, an advocate for change in status quo would contend the opposite. Political institutions should ensure policy stability so that policies have time to work but at the same time innovate when old policies have failed (Tsebelis, 1995; Jordan & Huitema, 2014, p. 294). As emphasised in the theory chapter, veto points may help to preserve robust environmental policies during periods of backlash, but it also makes it difficult to modernise these policies when that becomes necessary (Fiorino, 2011, p. 294). Sometimes, reliability is more important than speed. Perhaps in adopting and implementing policies that increases strictness, and therefore often posits more cost, it is advantageous with slower processes where the actors are not motivated by bribes and money. This is the main reason why I assumed a moderating effect of corruption on the direct relationship in the first place: the actors with veto power has different motivations and act differently in a 'rotten game' (Persson et al., 2019, p. 800). When the level of corruption is high, the process of implementing policies is impeded as corruption tends to impose poor enforcement and inadequate inspections (Povitkina, 2018, p. 415). In polities with low levels of corruption, this problem is arguably not present. In systems with more veto points and constraints on political actors, the policies get the time needed to work (Tsebelis, 1995). Hence, slow and steady wins the race.

In systems with high levels of corruption, the increase in veto points makes stricter environmental policies difficult to both adopt and implement. This notion was presented in the theory chapter. The POLCON V variable measures "the extent to which a change in the preferences of any one actor may lead to change in government policy" (W. J. Henisz, 2002, p. 363). Corruption can grease the wheels for anti-environmental interests (Heo et al., 2021). It might be easier for these interests to hinder adoption of more stringent policies, when there are more veto points to bribe. The intuition being that finding one veto point that sympathise with their cause is more likely (Vogel, 2003, p. 575). Withal, if a more strict environmental policy is adopted, the implementation of these policies is prone to be hampered by corrupted inspectors (Povitkina, 2018). As the dependent variable, EPS, measures the strictness of implemented policies, these dimensions might have been picked up in the regressions. For instance, when referring to the background chapter section 2.1.1, and the law passed in Russia for limiting private enterprises' greenhouse gas emissions. The law also involved a carbon credit systems, which allows business to have higher levels of carbon emission when they invest in recycling, reforestation, or cut back their emissions (The Moscow Times, 2021).

The carbon credit system can level out the lower levels of emission that the bill could induce. This law can therefore be argued to be less stringent, as it offers a reward in terms of permission to emit harmful gases. This is an example of how it might be difficult to impose pure costs on private business in a society with high levels of corruption and relatively high levels of political constraints, and therefore compensation for the costs is made.[3] Whether this case can illustrate the interplay between veto points and corruption on the stringency of policies presents an interesting objective for a case-study.

The interplay with corruption might help explain when the lock-in mechanisms of veto points contribute to increased stringency or decreased stringency. The results of this analysis call for further development of explanations as to *why* and *how* the level of corruption impacts the relationship between veto points and environmental policy stringency. It is important to emphasise that the discussion of these findings are *suggestions*. I do not claim to have evidence for any of the arguments presented in this section. This thesis does however establish a significant interdependent relationship. The interplay between corruption, veto points and environmental policy stringency will benefit from in-depth case studies to establish mechanisms and test the results of this thesis further (Manheim, Rich, Willnat, & Brians, 2006, p. 18).

7.3 Limitations to the Thesis

This section focuses on the limitations to this analysis which affects the credibility of the results. Many of the limitations has been consecutively discussed throughout the thesis. Yet, there are several limitations to that should be addressed further. First and foremost, I wish to emphasise that the thesis does not aim to make inferences about causality in the relationship between veto points and environmental policy stringency. The results of this thesis can only establish the covariational relationship (Rich, Brians, Manheim, & Willnat, 2006, p. 21). There are elements of causality testing: it is argued that the formation of veto points comes before the increase or decrease in environmental policy stringency, and that the presence of corruption leads to moderation in this relationship. Yet, the main argument solely dictates that the formation of veto points covaries with environmental policy stringency, and the hypotheses are covariational. The methodology is chosen accordingly.

[3] According to this sample, Russia has an average corruption level of 0.73 on a scale from 0-1. Referring to figure 6.2, the political constraints is quite high from 2000 and onwards.

The importance of democracy

The change in the significance level of the POLCON V coefficient from model 5 to model 6 is a result of adding *democracy* as a control variable. Further, all veto point-coefficients in the models estimated on the democratic sample (i.e., model 3, 4, 8, 9) are insignificant, and so is the interaction term. On one side, based on the insignificant results acquired from the democratic sample, one can assume that the formation of veto points in democratic countries is not a driver of variation in the strictness of environmental policies. The number of observations is the same so the change in significance level is not due to a change in units of the estimation sample. A different assertion of these results is that POLCON V is merely a measure of democracy itself. Indeed, "the central element of *consensus* democracy is about the dispersion of political power, i.e., more, rather than less veto points" (Birchfield & Crepaz, 1998, p. 181). This however, is not the definition of democracy of this thesis. I apply the minimal definition of democracy by Dahl (1998), namely polyarchy (Coppedge, Lindberg, Skaaning, & Teorell, 2016, p. 582). So for this analysis, this is not a main concern.

Validity concerns

The veto point approach is an analytically elegant way to model institutional constraints on policy change (Cao & Prakash, 2012, p. 70). Still, the approach has its limits. Critics of the veto point approach argue that the theory cannot fully explain the process of policy change (Hoffmann, 2010, p. 59). The theory chapter discussed the main pitfalls of veto point theory and the theoretical assumptions in more detail, and they will not be repeated here. Withal, political institutions, policy change, environmental policies, corruption - all these concepts are complex political phenomena. A statistical approach provides simplified answers to issues that in reality do not have simple answers. This is fruitful in establishing context and connections, and 'the bigger picture'. It is therefore considered an apt methodology for this analysis because the direct relationship between veto points and environmental policy stringency, to the best of my knowledge, has not been the focus of previous research.

There are a few additional concerns regarding the selected variables that I wish to expand on. For this analysis I have reduced the reality of political institutions, regimes, and multidimensional policies to a set of numbers. I adopt several indicators to measure a complex reality. For instance, there are several policy instruments to address climate and energy concerns, which are not included in the stringency variable (Galeotti et al., 2020, p. 2). Additionally, the use of indicators might create systematic measurement errors (Christophersen, 2013, p. 79). For instance, the criteria for constructing the corruption variable is quite subjective as it asks the coders "how pervasive is political corruption?" (Coppedge et al., 2021, p.). It does of course provide

coding criteria, but it is still subject to biases. I also have constructed control variables that consist of variables from the Lührmann et al. (2017) data set, which again are conditional on coders' decisions, and might be subjective to the coders' perceptions of the political phenomena in question. However, there are some dimensions of the indicators that are more easily quantified than others. To count the number of veto points for instance, is arguably more straight forward than measuring their preference alignments (Ganghof, 2003). Systematic measurement error does however not pose statistical issues (Christophersen, 2013, p. 79).

A further issue in regard to construct validity is the one-dimensional space on which the preferences of actors are measured for POLCON V. It is not clear what this dimension intends to represent (Jahn, 2011, p. 55). Although the calculations for veto points' preferences for CHECKS is not counted as adequate for the variable to represent congruence, Scartascini et al. (2018) make clear that the preferences are collected from placements on the traditional left-right dimension. I could not figure out what the dimension represents for POLCON V. Furthermore, neither POLCON V nor CHECKS include the aspect of *cohesion* between veto players that occupy one veto point. This is an important piece of the framework presented by Tsebelis (1995, 1999, 2002). The diverging statistical results between the measures of POLCON V and CHECKS reveal that the operationalisation of veto points matter when studying the strictness of environmental policies. POLCON V is considered more apt for assessing the relative stability of the same unit over time, as it computes the relative *congruence* of veto points (Nalepa & Xue, 2018). However, it can be beneficial to test a veto point operationalisation which also includes the cohesion of veto points on the strictness of environmental policies.

Modelling concerns

Fixed effects modelling is termed the 'gold standard' in economics and political science (Bell & Jones, 2015, p. 1). It is a rather conservative modelling strategy, which even might not detect effects that actually exists (Collischon & Eberl, 2020, p. 294), yet it holds pitfalls to consider. Firstly, there is still reason to be concerned about unobserved time-varying heterogeneity. I have included important control variables in the estimated regressions, but it is no guarantee that all effects are controlled for. Secondly, the average index of variance for POLCON V is quite low.[4] Figure 6.2, also shows little variation over time for several countries included in the data set. As the regressions are estimated using fixed effects this is problematic (Christophersen, 2013, p. 173). Little within-group variation is a limitation to estimating fixed effects, because the modelling strategy in fact exploits the variation within each country over

[4]Estimated average index of variance within all countries included in the analysis for POLCON V = 0.04564304 and for CHECKS = 4.024377.

time. A solution could be to use a different modelling strategy, but this would expose the analysis to omitted variable bias. Thus, I chose to estimate fixed-effects regressions despite of little within-group variation.[5]

The diagnostic plots in figure 6.3 and figure 6.4 showed concerning patterns for the model predictions of units with a score of 0.5 or lower on the stringency variable. The plots indicate that the assumption of linearity for the lower scores is violated, as the residuals in the regressions do not have conditional mean zero for these units. Consequently, the regression models seemingly do not predict variation in units with lower environmental policy stringency very well. Decreased stringency can also occur on higher levels of stringency, and I cannot determine based on the diagnostic plots that the decrease in predicted stringency correlating with high corruption levels and increased presence of veto points is unreliable findings. Yet, future analysis could benefit from more data on lower levels of stringency, and perhaps longer time-series data for more reliable estimates. That said, the diagnostics showed an overall satisfying model fit. The plots do not compute the clustered standard errors that take care of both heteroskedasticity and are robust to correlation over time within an entity (Stock & Watson, 2012, p. 404). There is also absence of perfect multicollinearity.

[5]I did estimate random effects models as well, but with the Hausman-test showing a p-value $<$ 2.2e-16 fixed effects is seemingly a superior choice. Either way, the main purpose is to analyse the effect of a covariate on the dependent variable. The other levels of effects that there might be is therefore out of scope for this analysis.

Chapter 8

Conclusion

The purpose of this thesis was to answer the research question: *Does the formation of veto points impact the strictness of environmental policies?* The thesis is placed within the scholarship of comparative environmental politics. In the research literature, the veto point approach is adopted to explain a broad spectrum of policy types and has proved efficient in doing so in several contexts. Moreover, the scholarship on environmental policies has gained momentum over the past decades, and the urgent nature of the issues that these policies aim to resolve make them imperative for political scientists to study. Previous research has demonstrated the impact of various branches of political institutions on the strictness of environmental policies. Several of these contributions have also uncovered the importance of corruption in explaining environmental policies, as well as in explaining how domestic political institutions impact environmental policy stringency. Yet, former research has not studied the direct relationship between the formation of veto points and the strictness of environmental policies. The objective of this study was to help fill this research gap.

The thesis has contributed to the literature with a statistical analysis on the direct effect of veto points on environmental policy stringency, in addition to the conditional relationship between these two factors on corruption levels. Furthermore, the study had a geographical focus beyond OECD- and EU-member states. The relationship was tested on panel data covering 32 countries and a temporal coverage of 1990-2015 (with several countries being covered from 1990-2012). The theoretical framework demonstrated how it is widely believed that an increase in the number of veto points and more divergent ideological placements of veto points, will inhibit the possibility for policy change. I theorised that the same political environment that impede policy change, will likewise hinder an increase in the strictness of environmental policies. The theoretical expectations were therefore that a larger number of veto points (i.e. more political constraints) correlates with lower levels of environmental policy stringency (H1). Further, the theoretical framework disclosed why the level of corruption can

impact the association between veto points and environmental policy stringency. To the best of my knowledge the interplay between corruption and veto points has hitherto not been tested systematically on environmental policy stringency. The hypothesis was therefore left rather exploratory, and stated that corruption has a moderating effect on the relationship between veto points (i.e. political constraints) and environmental policy stringency (H2). Environmental policy stringency was operationalised with an additive index, whilst veto points were operationalised with two separate measures: one additive institutional index, CHECKS, and one index adjusted to include the preference alignment across branches, namely POLCON V. Then the control variables were collected and constructed, and the data set was composed based on 6 different data sources.

The results were gathered from models estimated using two-way fixed effects OLS regressions with standard errors clustered by country. The models were estimated on two samples: one including both autocracies and democracies, and one sample consisting solely of democracies. The results gave little evidence for the direct relationship between veto points and variation in environmental policy stringency. However, the results gave strong indications of a relationship between veto points and environmental policy stringency that is dependent on the levels of corruption. When there is little corruption, an increase in the presence of veto points is likely to positively impact environmental policy stringency. On the contrary, when there is high levels of corruption, an increase in the presence of veto points is associated with lower levels of environmental policy stringency. Consequently, the answer to the research question is that the formation of veto points does have an impact on the strictness of environmental policies, but the relationship between the two is highly dependent on the levels of corruption. The results indicate that particularly in democracies, the formation of veto points does not impact how strict environmental policies are. However, how the yields foundation for further theory building. The direction of the marginal effects was in fact contradictory to findings in affiliated research. However, the interplay between corruption and veto points on policy strictness is predominantly uncharted territory. These results imply that the interplay should be investigated further.

8.1 Future research

The results and conclusion are based on the specific methodological decisions made for this analysis. The operationalisations of veto points are not flawless indicators which take into account the full concept of veto points as presented in the theory. The indicators do not measure the cohesion of veto players that occupies the veto points, which is arguably central to the concept. Future research can study the strictness of

environmental policies with other existing measures of veto points. Additionally, the analysis exclusively estimates within-effects because the veto points variables should not be compared cross-sectionally. Further research can adopt operationalisations of veto points that allows for between-effect estimation to enable cross-country analysis to explain variation in environmental policy stringency. Also, the operationalisation of environmental policy stringency does not take into account all dimensions of environmental policy. It could be beneficial to compare different categories of environmental policy, as veto points were previously found to impact different pollutant types variously (Cao & Prakash, 2012).

The second hypothesis is confirmed as the results show a significant moderating effect of corruption on the relationship between veto points and environmental policy stringency. To the best of my knowledge, this finding is novel, and calls for further investigation. This thesis tested an exploratory hypothesis on this interplay, and further research can help establish mechanisms that further explain the interdependence of veto points and corruption on environmental policy stringency. Qualitative approaches can better uncover mechanisms to this interplay.

One possible trajectory to develop theory on the interplay is to investigate whether an interaction effect between corruption and veto points is present in the variation of other policy types. The theoretical framework of this thesis was developed with environmental policies in mind, but veto point theory is developed to apply across policy categorisations. The results of this thesis shows the direction of the interdependent effect of veto points and corruption on the strictness of environmental policies. Further studies can investigate whether there is a similar or diverging interplay associated with other policy types.

The veto point framework is developed with an objective to be applicable across regime classifications. The distinct interaction effect can suggest that one should take into account corruption when investigating if/how veto points explain policy adoption in regimes with lower levels of democracy. This is a bold statement, as it is chiefly based on the findings in this thesis. Withal, it is reasonable to assume that corruption levels impact the motivations of veto players and the means organised interests without veto power have to influence policy. Consequently, this affects *how* veto points impact policy change. Additionally, perhaps when applying veto point theory on the strictness of policies, not merely policy change, it could be useful to include an interplay with corruption.

References

Adcock, R., & Collier, D. (2001). Measurement validity: A shared standard for qualitative and quantitative research. *American political science review*, 529–546. Retrieved from https://doi.org/10.1017/s0003055401003100

Angelova, M., Bäck, H., Müller, W. C., & Strobl, D. (2018). Veto player theory and reform making in western europe. *European journal of political research*, *57*(2), 282–307. Retrieved from https://doi.org/10.1111/1475-6765.12226

AP news. (2020). Dutch farmers protest reining in nitrogen oxide emissions. *AP News*. Retrieved from https://apnews.com/article/international-news-netherlands-the-hague-48279575ed93120f0c756f22a52ccb6a

Bäck, H., Teorell, J., & Lindberg, S. I. (2019). Cabinets, prime ministers, and corruption: A comparative analysis of parliamentary governments in post-war europe. *Political Studies*, *67*(1), 149–170. Retrieved from https://doi.org/10.1177/0032321718760806

Balthasar, A., Schreurs, M. A., & Varone, F. (2020). *Energy transition in europe and the united states: policy entrepreneurs and veto players in federalist systems.* SAGE Publications Sage CA: Los Angeles, CA. Retrieved from https://doi.org/10.1177/1070496519887489

Baumol, W. J., & Oates, W. (1988). *The theory of environmental policy.* Cambridge university press.

Becher, M. (2010). Constraining ministerial power: The impact of veto players on labor market reforms in industrial democracies, 1973-2000. *Comparative political studies*, *43*(1), 33–60. Retrieved from https://doi.org/10.1177/0010414009341716

Bell, A., & Jones, K. (2015). Explaining fixed effects: Random effects modeling of time-series cross-sectional and panel data. *Political Science Research and Methods*, *3*(1), 133–153. Retrieved from https://doi.org/10.1017/psrm.2014.7

Bernauer, T., & Koubi, V. (2009). Effects of political institutions on air quality. *Ecological economics*, *68*(5), 1355–1365. Retrieved from https://doi.org/10.1016/j.ecolecon.2008.09.003

Birchfield, V., & Crepaz, M. M. (1998). The impact of constitutional structures and collective and competitive veto points on income inequality in industrialized

democracies. *European Journal of Political Research*, *34*(2), 175–200. Retrieved from https://doi.org/10.1111/1475-6765.00404

Bjørnskov, C., & Rode, M. (2019). Regime types and regime change: A new dataset on democracy, coups, and political institutions. *The Review of International Organizations*, 1–21. Retrieved from https://doi.org/10.1007/s11558-019-09345-1

Botta, E., & Koźluk, T. (2014). Measuring environmental policy stringency in oecd countries: A composite index approach. *OECD*. Retrieved from https://doi.org/10.1787/5jxrjnc45gvg-en

Brambor, T., Clark, W. R., & Golder, M. (2006). Understanding interaction models: Improving empirical analyses. *Political analysis*, 63–82. doi: 10.1093/pan/mpi014

Braumoeller, B. F. (2004). Hypothesis testing and multiplicative interaction terms. *International organization*, 807–820. Retrieved from https://doi.org/10.1017/s0020818304040251

Bruce, P., & Bruce, A. (2017). *Practical statistics for data scientists: 50 essential concepts*. O'Reilly Media.

Cameron, A. C., Gelbach, J. B., & Miller, D. L. (2011). Robust inference with multiway clustering. *Journal of Business & Economic Statistics*, *29*(2), 238–249. Retrieved from https://doi.org/10.1198/jbes.2010.07136

Cao, X., & Prakash, A. (2012). Trade competition and environmental regulations: Domestic political constraints and issue visibility. *The Journal of Politics*, *74*(1), 66–82. Retrieved from https://doi.org/10.1017/s0022381611001228

Chakravarty, S. (2019). Inkredible india: The story of 1996 lok sabha election - all you need to know. *Zeenews*. Retrieved from https://zeenews.india.com/lok-sabha-general-elections-2019/inkredible-india-the-story-of-1996-lok-sabha-election-all-you-need-to-know-2198293.htmlr

Christophersen, K.-A. (2013). *Introduksjon til statistisk analyse: regresjonsbaserte metoder og anvendelse: med oppgaver og oppgaveløsninger*. Gyldendal.

Collischon, M., & Eberl, A. (2020). Let's talk about fixed effects: Let's talk about all the good things and the bad things. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, *72*(2), 289–299. Retrieved from https://doi.org/10.1007/s11577-020-00699-8

Coppedge, M., Gerring, J., Knutsen, C. H., Lindberg, S. I., Teorell, J., Alizada, N., ... Ziblatt, D. (2021). *V-dem [country–year/country–date] dataset v11.1.* Varieties of Democracy Project. Retrieved from https://doi.org/10.23696/vdemds21

Coppedge, M., Gerring, J., Knutsen, C. H., Lindberg, S. I., Teorell, J., Altman, D., ... others (2021). V-dem codebook v11.1.

Coppedge, M., Lindberg, S., Skaaning, S.-E., & Teorell, J. (2016). Measuring high

level democratic principles using the v-dem data. *International Political Science Review*, *37*(5), 580–593. doi: 10.1177/0192512115622046

Coppedge, M., & Reinicke, W. H. (1990). Measuring polyarchy. *Studies in Comparative International Development*, *25*(1), 51–72. Retrieved from https://link.springer.com/article/10.1007/BF02716905

Crepaz, M. M. (2002). Global, constitutional, and partisan determinants of redistribution in fifteen oecd countries. *Comparative Politics*, 169–188. Retrieved from https://doi.org/10.2307/4146936

Crespo-Tenorio, A., Jensen, N. M., & Rosas, G. (2014). Political liabilities: surviving banking crises. *Comparative Political Studies*, *47*(7), 1047–1074. Retrieved from https://doi.org/10.1177/0010414013488559

Dahl, R. (1998). *On democracy.* CT: Yale University Press.

Daley, D. M., Haider-Markel, D. P., & Whitford, A. B. (2007). Checks, balances, and the cost of regulation: Evidence from the american states. *Political Research Quarterly*, *60*(4), 696–706. Retrieved from https://doi.org/10.2139/ssrn.873489

Damania, R. (2002). Environmental controls with corrupt bureaucrats. *Environment and Development Economics*, 407–427. Retrieved from https://doi.org/10.1017/s1355770x02000256

Damania, R., Fredriksson, P. G., & List, J. A. (2003). Trade liberalization, corruption, and environmental policy formation: theory and evidence. *Journal of environmental economics and management*, *46*(3), 490–512. Retrieved from https://doi.org/10.2139/ssrn.253327

De Santis, R., Esposito, P., & Lasinio, C. J. (2021). Environmental regulation and productivity growth: main policy challenges. *International Economics*, *165*, 264–277. Retrieved from https://doi.org/10.1016/j.inteco.2021.01.002

DPI Dataset. (2017). *The database of political institutions 2017.* Retrieved from https://mydata.iadb.org/Reform-Modernization-of-the-State/Database-of-Political-Institutions-2017/938i-s2bw

Duffield, J. S., & Hankla, C. R. (2011). The efficiency of institutions: political determinants of oil consumption in democracies. *Comparative Politics*, *43*(2), 187–205. Retrieved from https://doi.org/10.5129/001041511793931816

Elster, K. (2021). Mener biff blir tre-fire kroner dyrere med høyere co-avgift. *NRK*. Retrieved from https://www.nrk.no/norge/beregninger-viser-sma-prisendringer-pa-mat-med-hoyere-co_-avgift-1.15431690

European Union. (2020). *2050 long-term strategy.* Retrieved from https://ec.europa.eu/clima/policies/strategies/2050_en

European Union. (2021). *Countries.* Retrieved from https://europa.eu/european-union/about-eu/countries_en#tab-0-1

Finnegan, J. J. (2019). Institutions, climate change, and the foundations of long-term policymaking. *Centre for Climate Change Economics and Policy Working Paper 353/Grantham Research Institute on Climate Change and the Environment Working Paper 321.*.

Fiorino, D. J. (2011). Explaining national environmental performance: approaches, evidence, and implications. *Policy Sciences*, *44*(4), 367–389. Retrieved from https://doi.org/10.1007/s11077-011-9140-8

Fredriksson, P. G., & Millimet, D. L. (2007). Legislative organization and pollution taxation. *Public Choice*, *131*(1-2), 217–242. Retrieved from https://doi.org/10.1007/s11127-006-9114-0

Fredriksson, P. G., & Svensson, J. (2003). Political instability, corruption and policy formation: the case of environmental policy. *Journal of public economics*, *87*(7-8), 1383–1405. Retrieved from https://doi.org/10.1016/s0047-2727(02)00036-1

Fredriksson, P. G., & Vollebergh, H. R. (2009). Corruption, federalism, and policy formation in the oecd: the case of energy policy. *Public Choice*, *140*(1-2), 205–221. Retrieved from https://doi.org/10.1007/s11127-009-9419-x

Fredriksson, P. G., & Wollscheid, J. R. (2006). Democratic institutions versus autocratic regimes: The case of environmental policy. *Public choice*, *130*(3), 381–393. Retrieved from https://doi.org/10.1007/s11127-006-9093-1

Friedrich, R. J. (1982). In defense of multiplicative terms in multiple regression equations. *American Journal of Political Science*, 797–833. Retrieved from https://doi.org/10.2307/2110973

Galeotti, M., Salini, S., & Verdolini, E. (2020). Measuring environmental policy stringency: Approaches, validity, and impact on environmental innovation and energy efficiency. *Energy Policy*, *136*, 111052. Retrieved from https://doi.org/10.1016/j.enpol.2019.111052

Ganghof, S. (2003). Promises and pitfalls of veto player analysis. *Swiss Political Science Review*, *9*(2), 1–25. Retrieved from https://doi.org/10.1002/j.1662-6370.2003.tb00411.x

Hallerberg, M. (2011). Empirical applications of veto player analysis and institutional effectiveness. In *Reform processes and policy change* (pp. 21–42). Springer. doi: 10.1007/978-1-4419-5809-9

Han, H. (2015). Authoritarian environmentalism under democracy: Korea's river restoration project. *Environmental Politics*, *24*(5), 810–829. Retrieved from https://doi.org/10.1080/09644016.2015.1051324

Heller, W. B., Keefer, P., & McCubbins, M. D. (1998). Political structure and economic liberalization: conditions and cases from the developing world. *the Origins of Liberty*. Retrieved from https://doi.org/10.2307/j.ctv1ddcz33.12

Heller, W. B., Kyriacou, P. A., & Roca-Sagalés, O. (2014). Legislative vetoes and corruption: The effect of formal checks on governance.
doi: 10.1111/1475-6765.12155

Heller, W. B., & McCubbins, M. D. (1996). Politics, institutions, and outcomes: Electricity regulation in argentina and chile. *The Journal of Policy Reform*, *1*(4), 357–387. Retrieved from https://doi.org/10.1080/13841289608523368

Henisz, W. (2000). *The political constraint index (polcon) dataset. university of pennsylvania.*

Henisz, W. J. (2002). The institutional environment for infrastructure investment. *Industrial and corporate change*, *11*(2), 355–389. Retrieved from https://doi.org/10.1093/icc/11.2.355

Henisz, W. J. (2004). Political institutions and policy volatility. *Economics & Politics*, *16*(1), 1–27. Retrieved from https://doi.org/10.1111/j.1468-0343.2004.00129.x

Henisz, W. J. (2015). *Polcon 2005 codebook.* Retrieved from https://mgmt.wharton.upenn.edu/wp-content/uploads/2016/12/CODEBOOK_2005.pdf

Heo, Y., Hou, F., & Park, S. G. (2021). Does corruption grease or sand the wheels of investment or innovation? different effects in advanced and emerging economies. *Applied Economics*, *53*(1), 35–60. Retrieved from https://doi.org/10.2139/ssrn.3353254

Hoffmann, N. (2010). Political institutions and policy outcomes: The political constraints approach of henisz. *CESifo DICE Report*, *8*(2), 53–59.

Huber, E., Ragin, C., & Stephens, J. D. (1993). Social democracy, christian democracy, constitutional structure, and the welfare state. *American journal of Sociology*, *99*(3), 711–749.

Hyeong-Woo, K. (2021). Local governments set target to go carbon neutral by 2050. *The Korea Herald*. Retrieved from http://www.koreaherald.com/view.php?ud=20210524000745&ACE_SEARCH=1

Immergut, E. M. (1992). The rules of the game: The logic of health policy-making in france, switzerland, and sweden. *Structuring politics: Historical institutionalism in comparative analysis*, *4*(4), 57–89. Retrieved from https://doi.org/10.1017/cbo9780511528125.004

Immergut, E. M., et al. (1992). *Health politics: interests and institutions in western europe.* CUP Archive.

Jackson, J. E. (2020). Corrected standard errors with clustered data. *Political Analysis*, *28*(3), 318–339. Retrieved from https://doi.org/10.1017/pan.2019.38

Jagers, S. C., Harring, N., & Matti, S. (2018). Environmental management from left to right–on ideology, policy-specific beliefs and pro-environmental policy support. *Journal of Environmental Planning and Management*, *61*(1), 86–104. Retrieved

from https://doi.org/10.1080/09640568.2017.1289902

Jahn, D. (2011). The veto player approach in macro-comparative politics: concepts and measurement. In *Reform processes and policy change* (pp. 43–68). Springer. Retrieved from 10.1007/978-1-4419-5809-9

Jordan, A., & Huitema, D. (2014). *Innovations in climate policy: The politics of invention, diffusion, and evaluation.* Taylor & Francis. Retrieved from https://doi.org/10.1080/09644016.2014.923614

Kayser, M. A., & Rehmert, J. (2020). Coalition prospects and policy change: an application to the environment. *Legislative Studies Quarterly*.

Kettl, D. F. (1998, October). Environmental policy: The next generation. *Brookings*. Retrieved from https://www.brookings.edu/research/environmental-policy-the-next-generation/

Kim, B. (2015). *Understanding diagnostic plots for linear regression analysis.* Retrieved from https://data.library.virginia.edu/diagnostic-plots/

Knill, C., Debus, M., & Heichel, S. (2010). Do parties matter in internationalised policy areas? the impact of political parties on environmental policy outputs in 18 oecd countries, 1970–2000. *European journal of political research*, *49*(3), 301–336. Retrieved from https://doi.org/10.1111/j.1475-6765.2009.01903.x

Konisky, D. M., & Woods, N. D. (2016). Environmental policy, federalism, and the obama presidency. *Publius: The Journal of Federalism*, *46*(3), 366–391. Retrieved from https://doi.org/10.1093/publius/pjw004

Kramarz, T., Cosolo, D., & Rossi, A. (2017). Judicialization of environmental policy and the crisis of democratic accountability. *Review of Policy Research*, *34*(1), 31–49. Retrieved from https://doi.org/10.1111/ropr.12218

Kulin, J., & Johansson Sevä, I. (2019). The role of government in protecting the environment: Quality of government and the translation of normative views about government responsibility into spending preferences. *International Journal of Sociology*, *49*(2), 110–129. Retrieved from https://doi.org/10.1080/00207659.2019.1582964

Leichenko, R., & Eisenhauer, D. C. (2016). Global environmental change: Human dimensions. *International Encyclopedia of Geography: People, the Earth, Environment and Technology: People, the Earth, Environment and Technology*, 1–11. Retrieved from https://doi.org/10.1002/9781118786352.wbieg0649

Lipp, J. (2007). Lessons for effective renewable electricity policy from denmark, germany and the united kingdom. *Energy policy*, *35*(11), 5481–5495. Retrieved from https://doi.org/10.1016/j.enpol.2007.05.015

Lopez, R., & Mitra, S. (2000). Corruption, pollution, and the kuznets environment curve. *Journal of Environmental Economics and Management*, *40*(2), 137–150. Retrieved from https://doi.org/10.1006/jeem.1999.1107

Lührmann, A., Düpont, N., Higashijima, M., Kavasoglu, Y. B., Marquardt, K. L., Bernhard, M., ... Seim, B. (2017). *Varieties of party identity and organization (v-party) dataset v1.* Varieties of Democracy (V-Dem) Project. Retrieved from https://doi.org/10.23696/vpartydsv1

MacIntyre, A. (2001). Institutions and investors: The politics of the economic crisis in southeast asia. *International Organization*, 81–122. Retrieved from https://doi.org/10.1162/002081801551423

Madden, N. J. (2014). Green means stop: veto players and their impact on climate-change policy outputs. *Environmental Politics*, *23*(4), 570–589. Retrieved from https://doi.org/10.1080/09644016.2014.884301

Manheim, J. B., Rich, R. C., Willnat, L., & Brians, C. L. (2006). *Empirical political analysis. research methods in political science.* Pearson.

Mansfield, E. D., Milner, H. V., & Pevehouse, J. C. (2015). Vetoing co-operation: The impact of veto players on preferential trading arrangements. In *The political economy of international trade* (pp. 265–294). World Scientific. Retrieved from https://doi.org/10.1142/9789814644297_0012

Mauro, P. (1998). Corruption and the composition of government expenditure. *Journal of Public economics*, *69*(2), 263–279. Retrieved from https://doi.org/10.1016/s0047-2727(98)00025-5

McCann, K. S. (2000). The diversity–stability debate. *Nature*, *405*(6783), 228–233. Retrieved from https://doi.org/10.1038/35012234

Mishra, A. (2013). Bihar govt set to resist national water policy. *Hindustan Times*. Retrieved from https://www.hindustantimes.com/patna/bihar-govt-set-to-resist-national-water-policy/story-eyTgEExfI0exNwdMlfHxlN.html

Mourao, P. R. (2019). The effectiveness of green voices in parliaments: Do green parties matter in the control of pollution? *Environment, Development and Sustainability*, *21*(2), 985–1011. Retrieved from https://doi.org/10.1007/s10668-017-0070-2

Mummolo, J., & Peterson, E. (2018). Improving the interpretation of fixed effects regression results. *Political Science Research and Methods*, *6*(4), 829–835. Retrieved from https://doi.org/10.1017/psrm.2017.44

Murillo, M. V., & Martínez-Gallardo, C. (2007). Political competition and policy adoption: Market reforms in latin american public utilities. *American Journal of Political Science*, *51*(1), 120–139. Retrieved from https://doi.org/10.1111/j.1540-5907.2007.00241.x

Nalepa, M., & Xue, J. (2018). Can the number of veto players measure policy stability? Retrieved from http://www.monikanalepa.com/uploads/6/6/3/1/66318923/vetoplayersnew_rev0809.pdf

Neumayer, E. (2002). Do democracies exhibit stronger international environmental

commitment? a cross-country analysis. *Journal of peace research*, *39*(2), 139–164. Retrieved from https://doi.org/10.2139/ssrn.260730

Obinger, H. (1998). Federalism, direct democracy, and welfare state development in switzerland. *Journal of Public Policy*, 241–263. Retrieved from https://doi.org/10.1017/s0143814x98000129

OECD. (2016). How stringent are environmental policies? *OECD Publishing*.

OECD.Stat. (2017). *Dataset: Environmental policy stringency index.* Retrieved from https://stats.oecd.org/Index.aspx?DataSetCode=EPS

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & quantity*, *41*(5), 673–690. Retrieved from https://doi.org/10.1007/s11135-006-9018-6

O'Reilly, R. F. (2005). Veto points, veto players, and international trade policy. *Comparative Political Studies*, *38*(6), 652–675. Retrieved from https://doi.org/10.1177/0010414004274379

Parrado, S., & Galli, D. (2021). Intergovernmental veto points in crisis management: Italy and spain facing the covid-19 pandemic. *International Review of Administrative Sciences*, 0020852320985925. Retrieved from https://doi.org/10.1177/0020852320985925

Pellegrini, L. (2011). *Corruption, development and the environment*. Springer Science & Business Media. doi: 10.1007/978-94-007-0599-9_5

Pellegrini, L., & Gerlagh, R. (2006). Corruption, democracy, and environmental policy: an empirical contribution to the debate. *The Journal of Environment & Development*, *15*(3), 332–354. Retrieved from https://doi.org/10.1007/978-94-007-0599-9_5

Persson, A., Rothstein, B., & Teorell, J. (2019). Getting the basic nature of systemic corruption right: A reply to marquette and peiffer. *Governance*, *32*(4), 799–810. Retrieved from https://doi.org/10.1111/gove.12403

Pierson, P. (1995). Fragmented welfare states: Federal institutions and the development of social policy. *Governance*, *8*(4), 449–478. Retrieved from https://doi.org/10.1111/j.1468-0491.1995.tb00223.x

Povitkina, M. (2018). The limits of democracy in tackling climate change. *Environmental Politics*, *27*(3), 411–432. Retrieved from 10.1080/09644016.2018.1444723

Requate, T. (2005). Dynamic incentives by environmental policy instruments—a survey. *Ecological economics*, *54*(2-3), 175–195. Retrieved from https://doi.org/10.1016/j.ecolecon.2004.12.028

Rich, R. C., Brians, C. L., Manheim, J. B., & Willnat, L. (2006). *Empirical political analysis: Quantitative and qualitative research methods*. Routledge. Retrieved from https://doi.org/10.4324/9781315109664-12

Sahu, G. (2005). Environmental governance and role of judiciary in india. In *Proceed-*

ings of the first international conference on environmentally sustainable development v. 1-3.

Scartascini, C., Cruz, C., & Keefer, P. (2018). The database of political institutions 2017 (dpi2017). *Washington, Banco Interamericano de Desarrollo*. Retrieved from http://dx.doi.org/10.18235/0001027

Singh, K. M., Singh, R., Meena, M., & Kumar, A. (2013). Water policy in india: A review. *Available at SSRN 2226877*. Retrieved from https://ssrn.com/abstract=2226877orhttp://dx.doi.org/10.2139/ssrn.2226877

Singh, S. P., & Dunn, K. P. (2013). Veto players, the policy-making environment and the expression of authoritarian attitudes. *Political Studies*, *61*(1), 119–141. Retrieved from https://doi.org/10.1111/j.1467-9248.2012.00959.x

Sovacool, B. K. (2013). Energy policymaking in denmark: Implications for global energy security and sustainability. *Energy Policy*, *61*, 829–839. Retrieved from https://doi.org/10.1016/j.enpol.2013.06.106

Stock, J. H., & Watson, M. W. (2012). *Introduction to econometrics* (Vol. 3). Pearson New York.

Stork, N. E. (2010). Re-assessing current extinction rates. *Biodiversity and Conservation*, *19*(2), 357–371. Retrieved from https://doi.org/10.1007/978-94-007-0168-7_5

Taylor, S. L., Shugart, M. S., & Lijphart, A. (2014). *A different democracy*. Yale University Press.

The Local. (2019). Denmark presents plan to reduce nitrogen emissions in farming. *The Local*. Retrieved from https://www.thelocal.dk/20191126/denmark-presents-plan-to-reduce-nitrogen-emissions-in-farming/

The Moscow Times. (2019). Putin says zero-carbon energy will 'send us bak to caves'. *The Moscow Times*. Retrieved from https://www.themoscowtimes.com/2019/11/20/putin-zero-carbon-energy-back-to-caves-a68254

The Moscow Times. (2021). Russia passes first law to limit greenhouse gas emissions. *The Moscow Times*. Retrieved from https://www.themoscowtimes.com/2021/06/03/russia-passes-first-law-to-limit-greenhouse-gas-emissions-a74095

Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research? *Annu. Rev. Polit. Sci.*, *10*, 211–244. Retrieved from https://doi.org/10.1146/annurev.polisci.10.081205.095418

Tsebelis, G. (1995). Decision making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism. *British journal of political science*, 289–325. Retrieved from http://www.jstor.org/stable/194257

Tsebelis, G. (1999). Veto players and law production in parliamentary democracies: An empirical analysis. *American political science review*, 591–608. Retrieved from https://www.jstor.org/stable/2585576

Tsebelis, G. (2002). *Veto players: How political institutions work*. Princeton University Press.

Tsebelis, G. (2011). Veto player theory and policy change: An introduction. In *Reform processes and policy change* (pp. 3–18). Springer. doi: 10.1007/978-1-4419-5809-9

Vogel, D. (1993). Representing diffuse interests in environmental policymaking. *Do institutions matter*, 237–271.

Vogel, D. (2003). The hare and the tortoise revisited: The new politics of consumer and environmental regulation in europe. *British Journal of Political Science*, 557–580. Retrieved from https://doi.org/10.4324/9781849771221-26

Wang, F., Wang, J., Ren, J., Li, Z., Nie, X., Tan, R. R., & Jia, X. (2020). Continuous improvement strategies for environmental risk mitigation in chemical plants. *Resources, Conservation and Recycling*, *160*, 104885. Retrieved from https://doi.org/10.1016/j.resconrec.2020.104885

Wang, K., Yan, M., Wang, Y., & Chang, C. P. (2020). The impact of environmental policy stringency on air quality. *Atmospheric Environment*, *231*, 117522. Retrieved from https://doi.org/10.1016/j.atmosenv.2020.117522

Weaver, R. K., & Rockman, B. A. (2010). *Do institutions matter?: government capabilities in the united states and abroad*. Brookings Institution Press.

Wilson, J. K., & Damania, R. (2005). Corruption, political competition and environmental policy. *Journal of Environmental Economics and Management*, *49*(3), 516–535. Retrieved from https://doi.org/10.1016/j.jeem.2004.06.004

Wolde-Rufael, Y., & Mulat-Weldemeskel, E. (2021). Do environmental taxes and environmental stringency policies reduce co 2 emissions? evidence from 7 emerging economies. *Environmental Science and Pollution Research*, 1–17. Retrieved from https://doi.org/10.1007/s11356-020-11475-8

Woods, N. D. (2008). The policy consequences of political corruption: Evidence from state environmental programs. *Social Science Quarterly*, *89*(1), 258–271. Retrieved from https://doi.org/10.1111/j.1540-6237.2008.00531.x

World Bank. (2021). *World development indicators*. Retrieved from https://databank.worldbank.org/source/world-development-indicators

World development indicators Washington, D.C.: World Bank Group. (2015). *World development indicators 2015 (english)*. Retrieved from http://documents.worldbank.org/curated/en/795941468338533334/World-development-indicators-2015

Worrall, J. L. (2010). A user-friendly introduction to panel data modeling. *Journal of*

Criminal Justice Education, *21*(2), 182–196. Retrieved from https://doi.org/10.1080/10511251003693702

Appendix A

Descriptive statistics

A.0.1 All countries sample

Summary statistics

Table A.1: All countries sample summary statistics

Variable name	Mean	Median	Standard deviation
Stringency	1.5849	1.4167	0.9635145
POLCON V	0.7082	0.7635	0.2117537
CHECKS	4.095	4.000	1.970366
Green presence	1.706	0.000	3.672199
Government polarization	1.851	1.994	1.50891
GDP	29733.7	32683.3	19912.56
EU	0.4433	0.0000	0.497095
Trade openness	67.79	58.94	34.66077
Corruption	0.1876	0.0750	0.2198742
Democracy	0.794	0.870	0.190206

Histograms

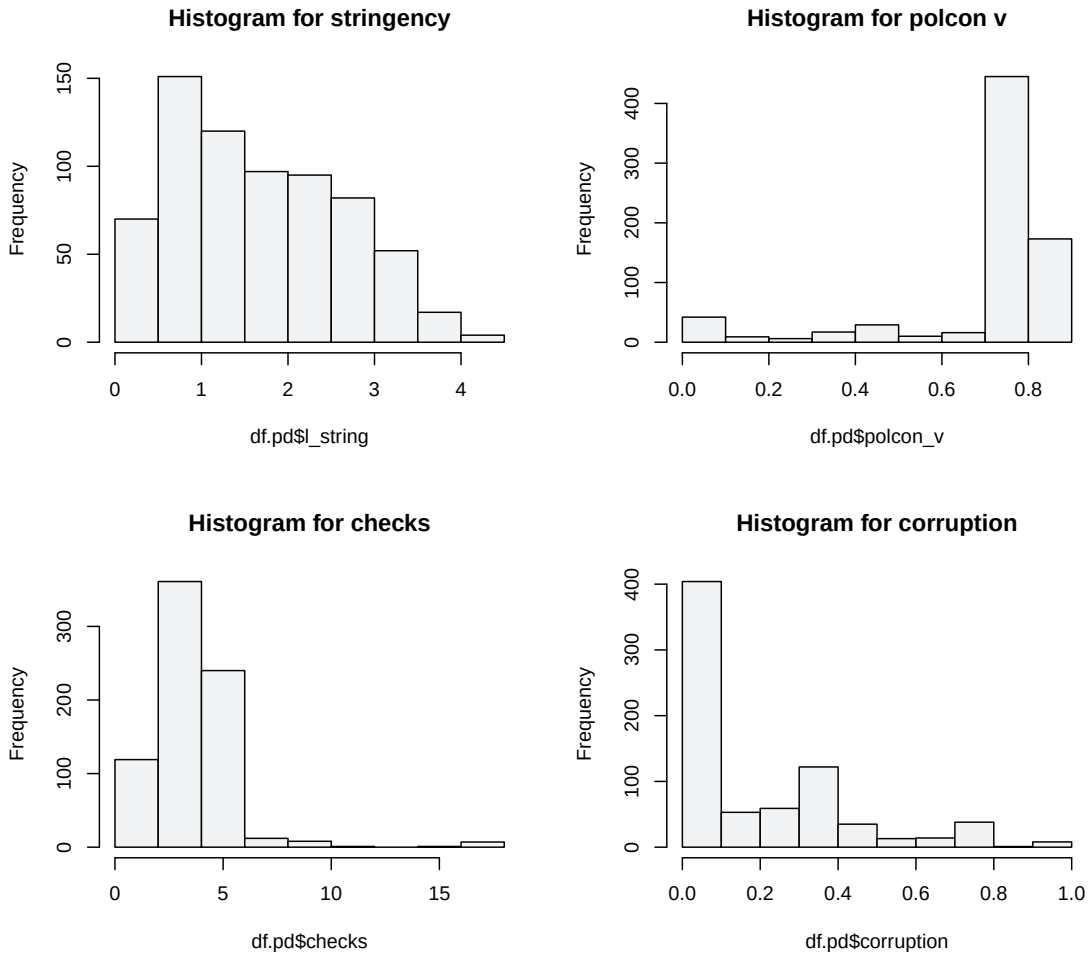

Figure A.1: Diagnostic plots for model 7.

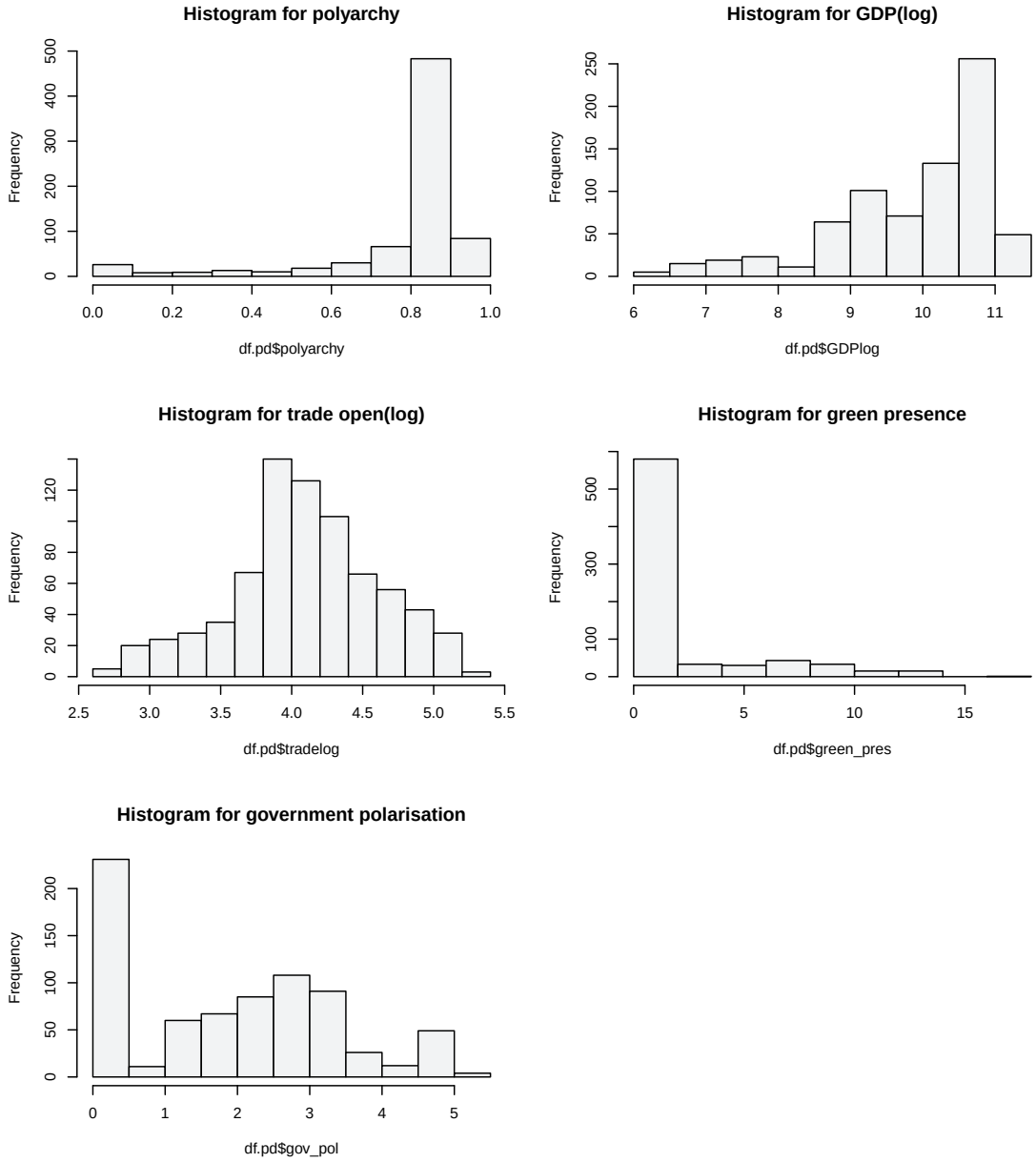

Figure A.2: Diagnostic plots for model 7.

A.0.2 Democratic sample

Table A.2: Democratic sample summary statistics

Variable name	**Mean**	**Median**	**Standard deviation**
Stringency	1.6952	1.5542	0.952795
POLCON V	0.76457	0.76819	0.1126204
CHECKS	4.352	4.000	1.890305
Green presence	1.913	0.000	3.837642
Government polarization	1.054	0.538	1.443692
GDP	32695.3	35495.0	19052.3
EU	0.4971	0.0000	0.5003533
Trade openness	69.86	61.64	35.96964
Corruption	0.1458	0.0670	0.1802872
Democracy	0.8474	0.8750	0.07883885

Histograms

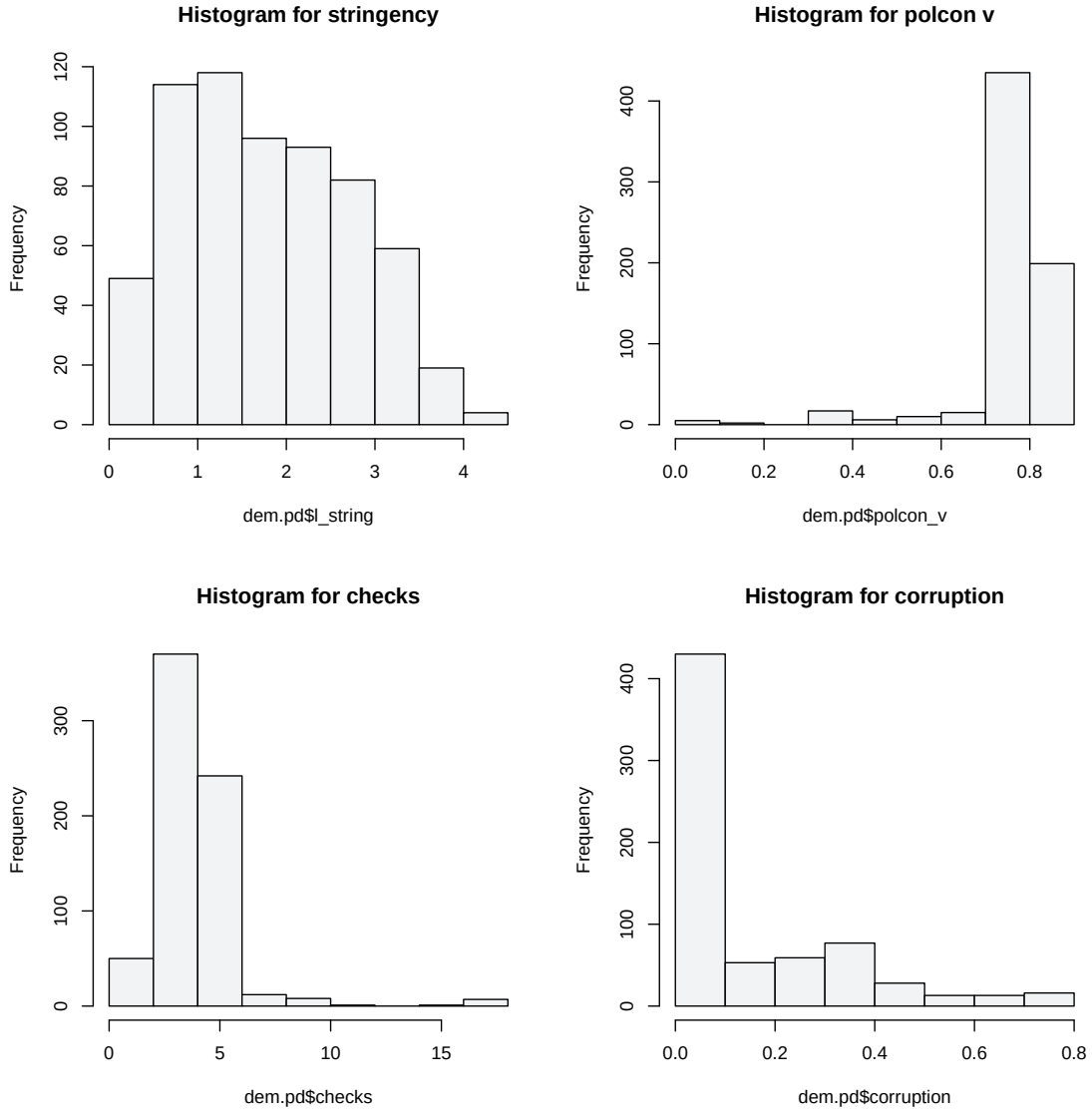

Figure A.3: Diagnostic plots for model 7.

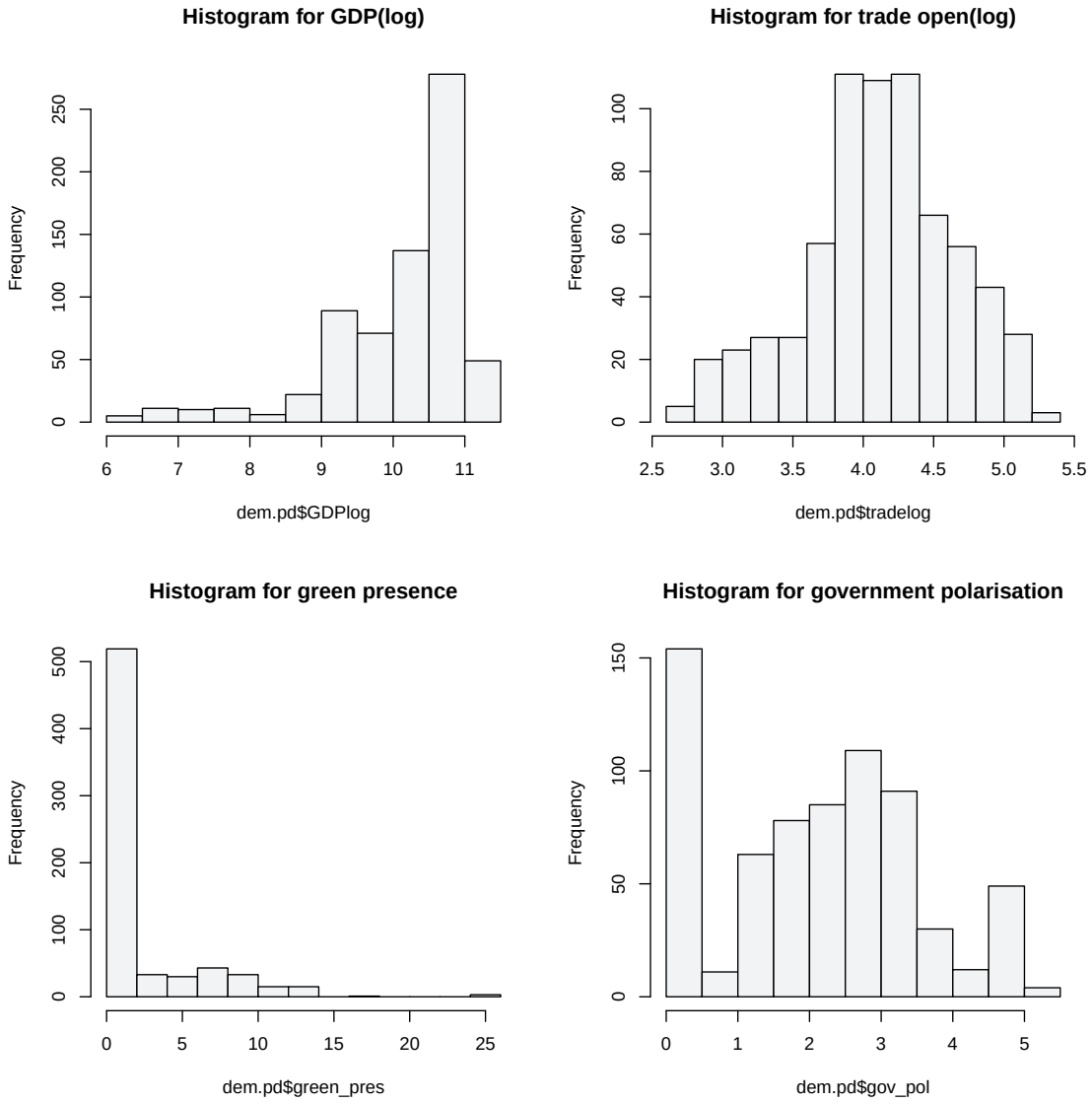

Figure A.4: Diagnostic plots for model 7.

Appendix B

The EPS indicator

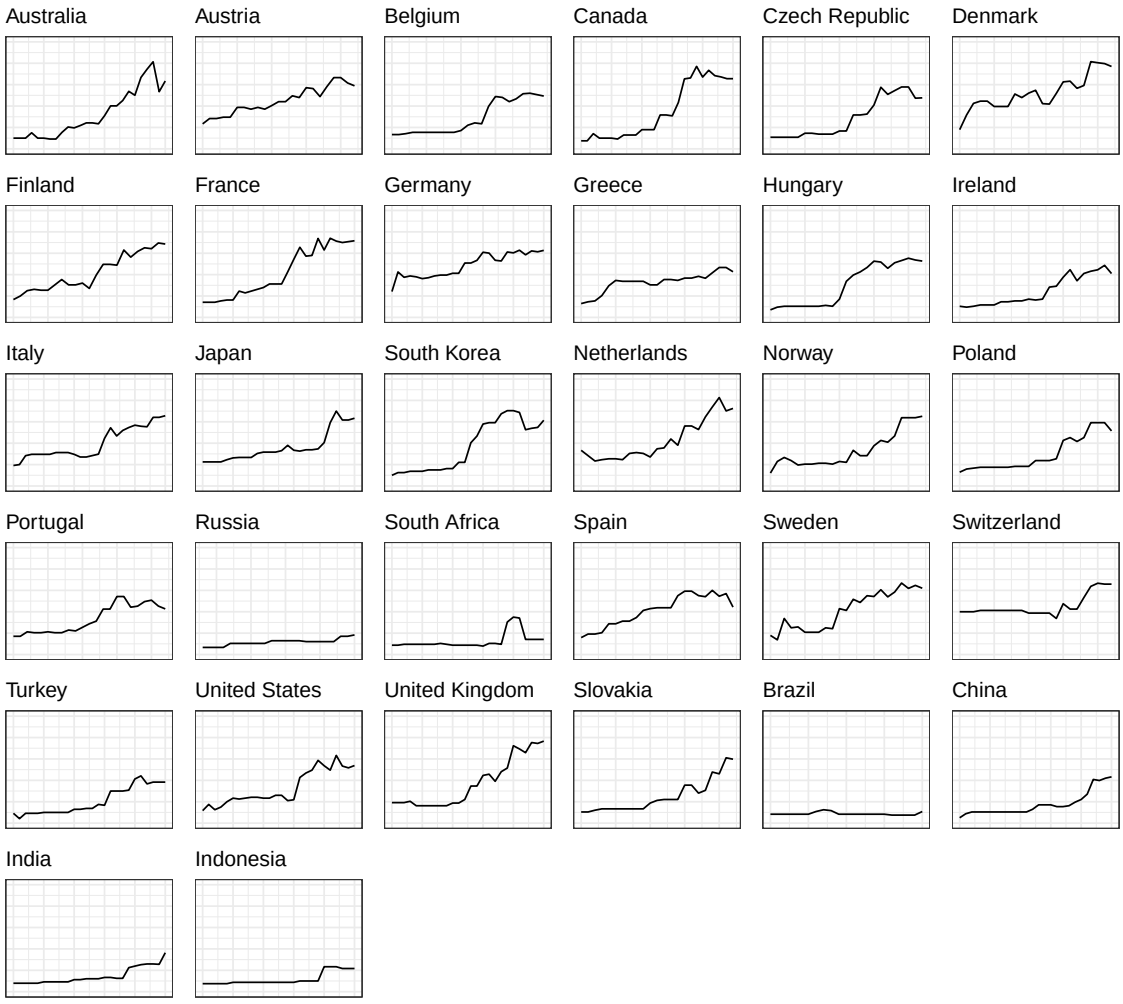

Figure B.1: Stringency across time for each country

The plots in figure B.1 show the development of environmental policy stringency across time for each country included in the analysis. It is evident that in all countries there has been an increase in the strictness of environmental policies over the last decades. The BRIICS countries portrays the lowest values of stringency, with Brazil conveying

the least growth and level of stringency. This is corroborated with Brazil also having the lowest mean on the EPS variable in figure 5.1.

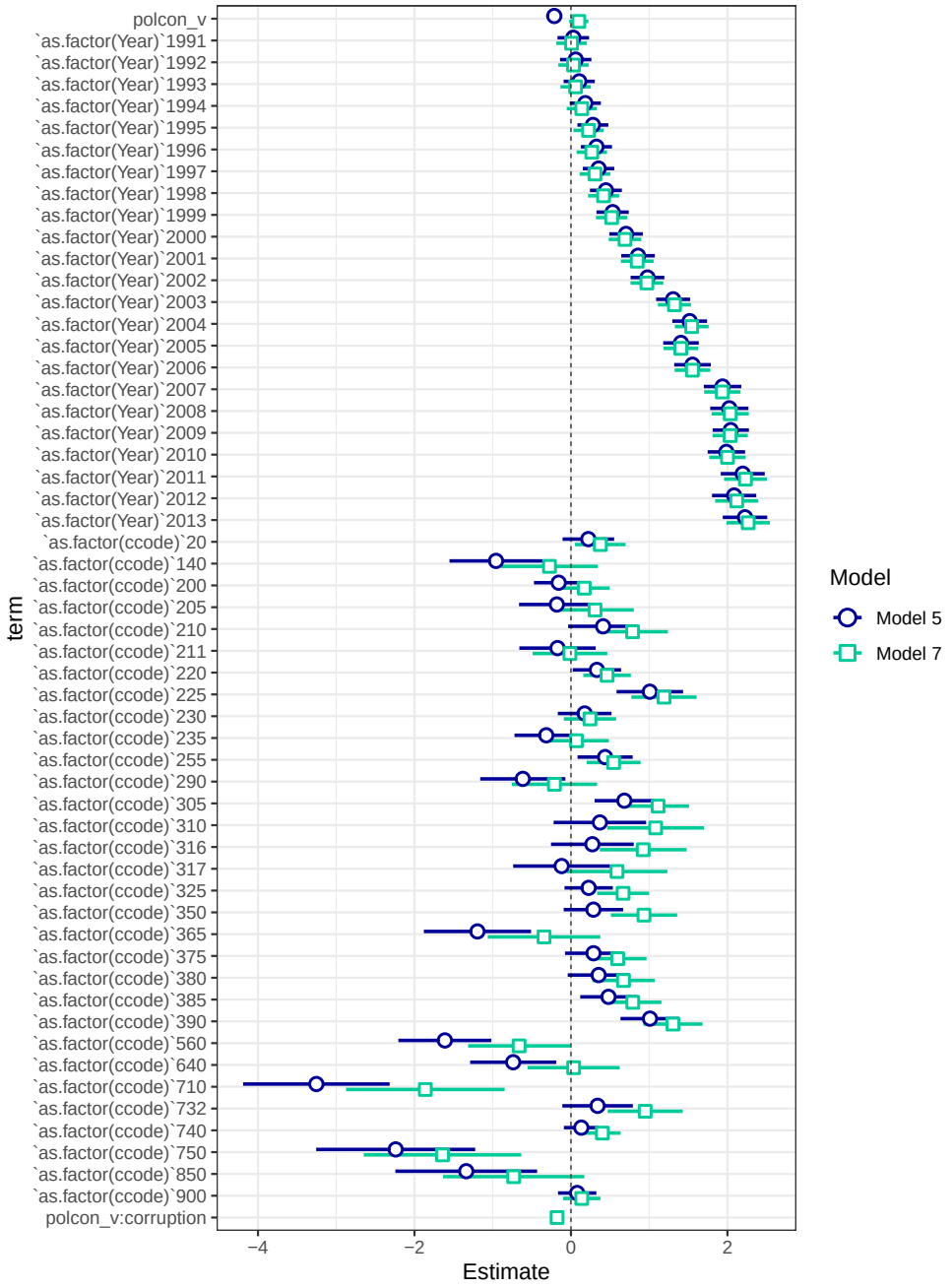

Figure B.2: Coefficient plot for model 5 and model 7

Figure B.2 shows the coefficient plot for model 5 and 7. It shows that the effect of years is increasingly positive on environmental policy stringency.

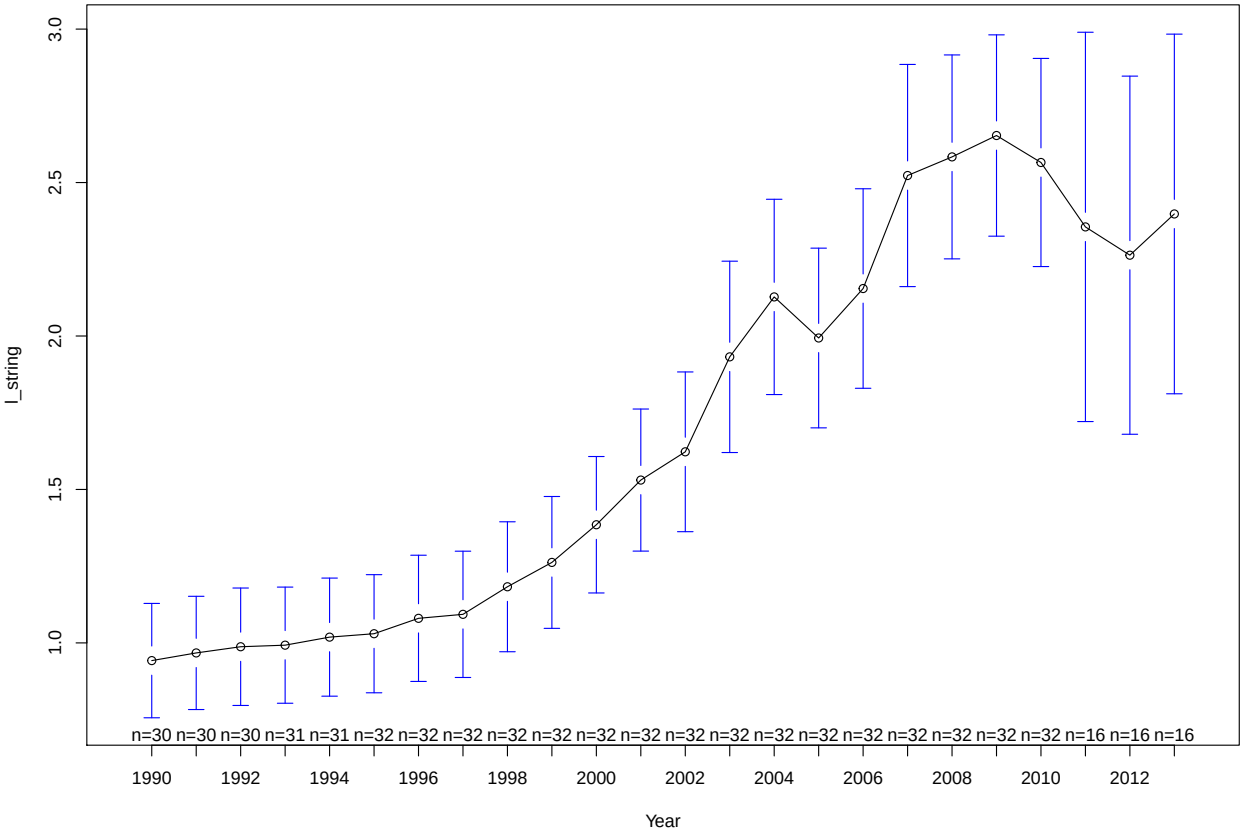

Figure B.3: Heterogeneity in EPS across years

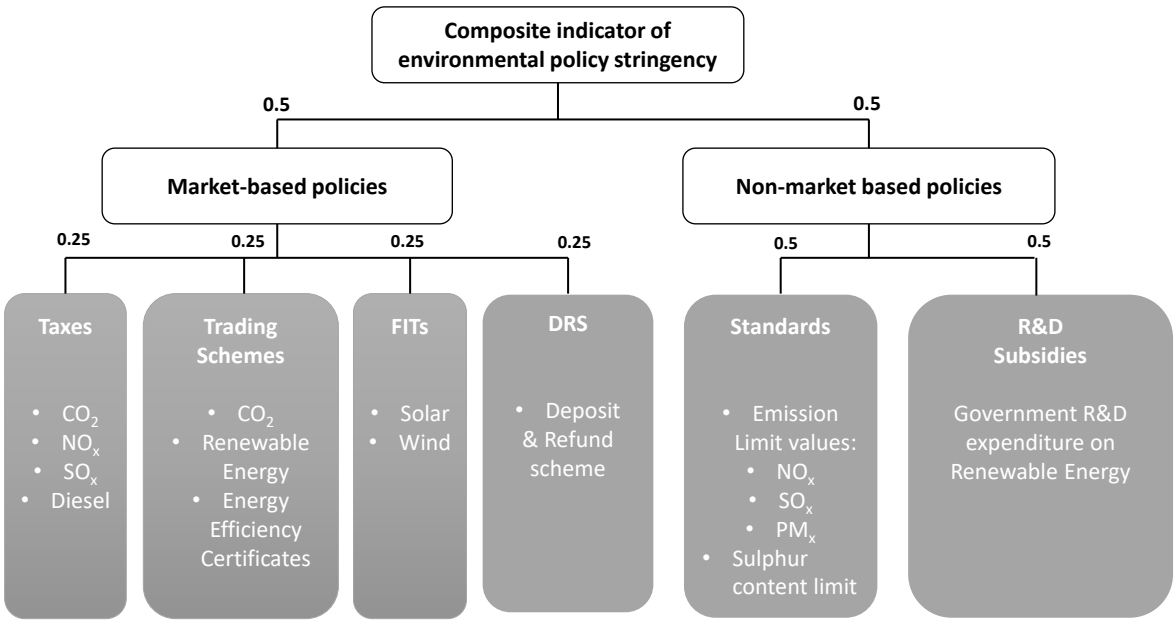

Figure B.4: The composite indicator of EPS

Figure B.4 is copied from OECD (2016, p. 5), and shows the structure of the EPS indicator.

Appendix C

Data visualisation

Panel overview

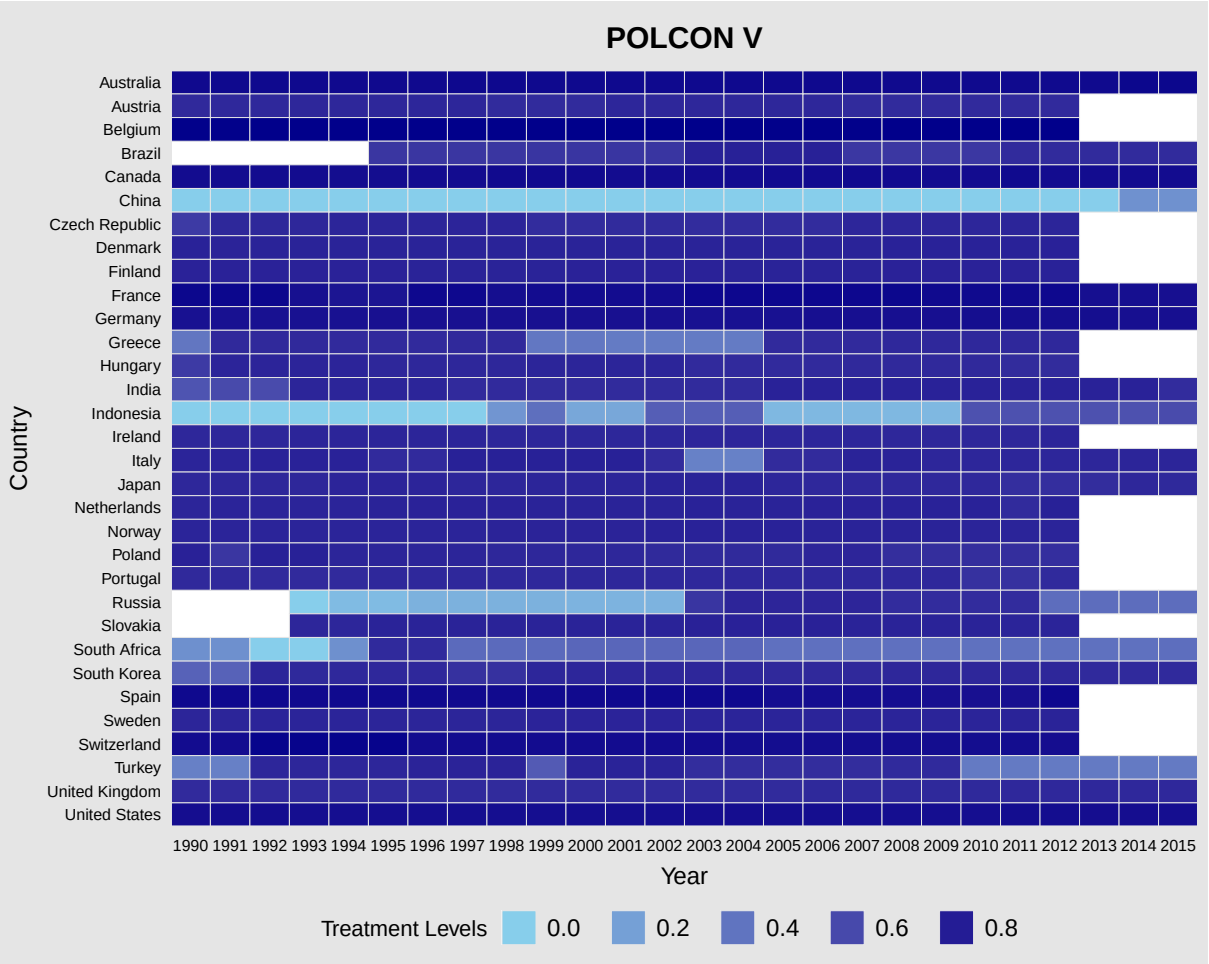

Figure C.1: Polcon V: visualisation of panel data

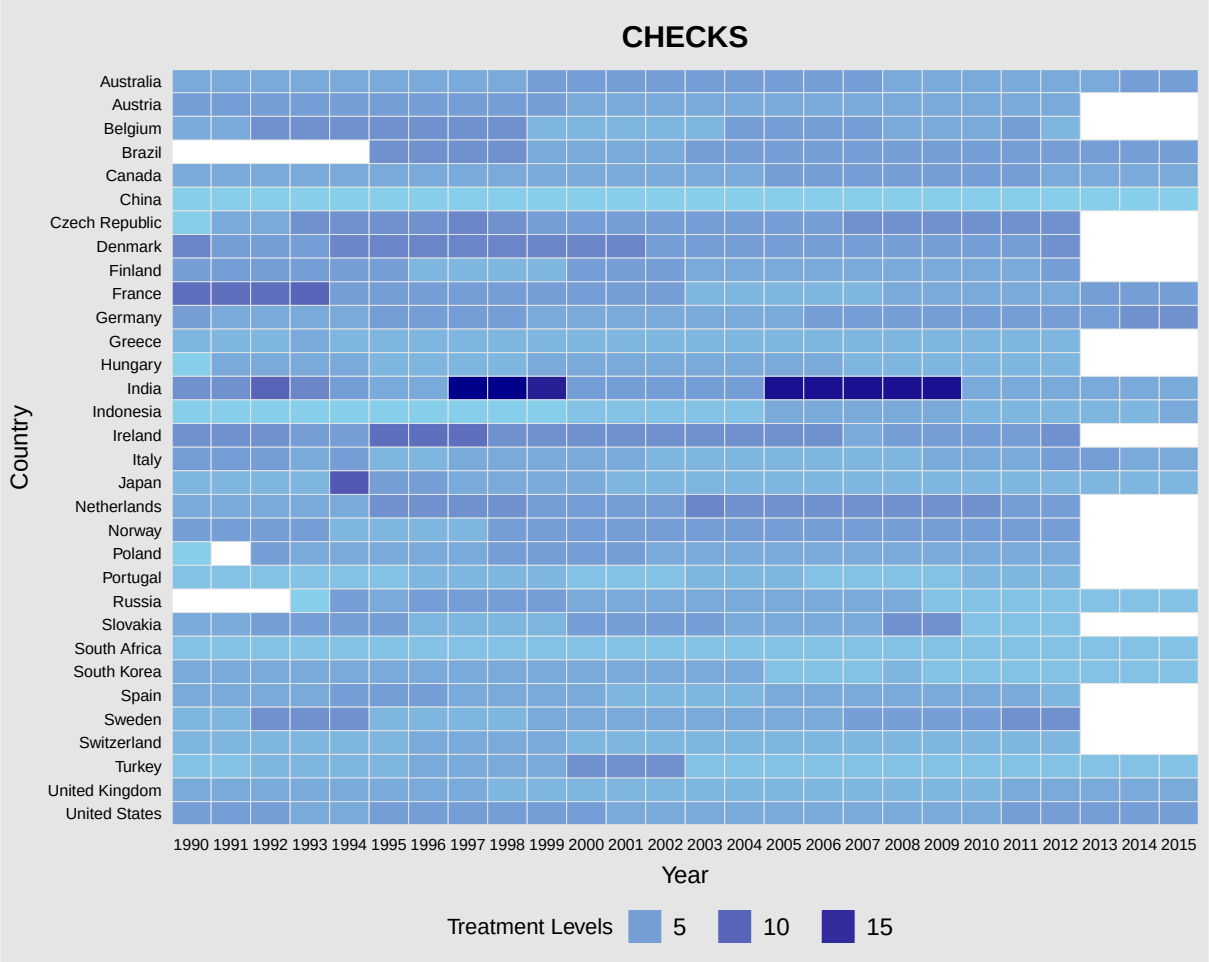

Figure C.2: Checks: visualisation of panel data

Bubble charts

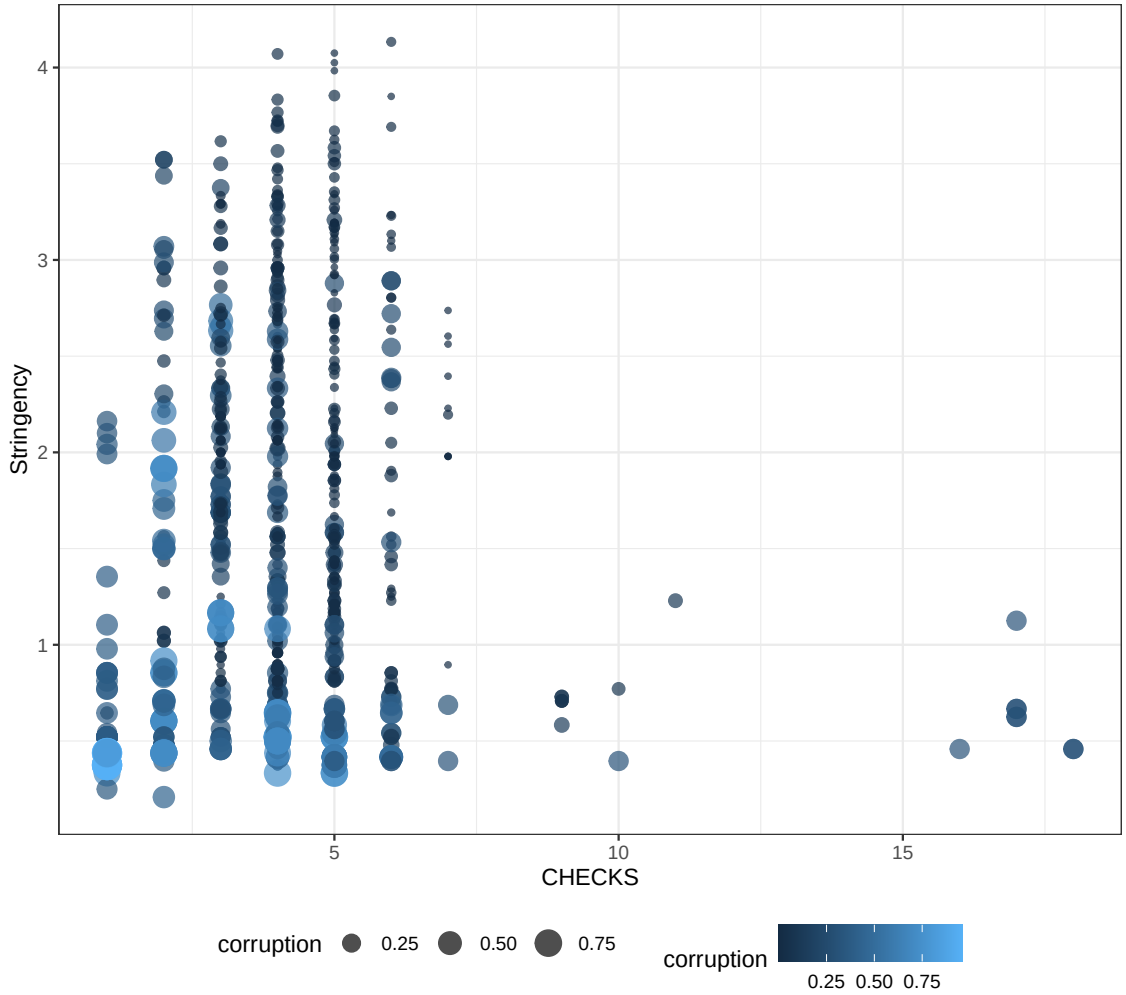

Figure C.3: Diagnostic plots for model 7.

The figure shows a bubble chart, where the relationship between level of stringency (y) and CHECKS (x) is represented. The corresponding corruption levels of each unit is represented through circle size. The plot shows that the bigger circles, i.e., higher corruption levels can be found for the same units that also have low stringency and low numbers of veto points. Figure C.4 shows similar patterns for the distribution of units on POLCON V. There are a few units with high levels of corruption and political constraints, but the units with highest corruption levels have relatively lower levels of political constraints and policy stringency.

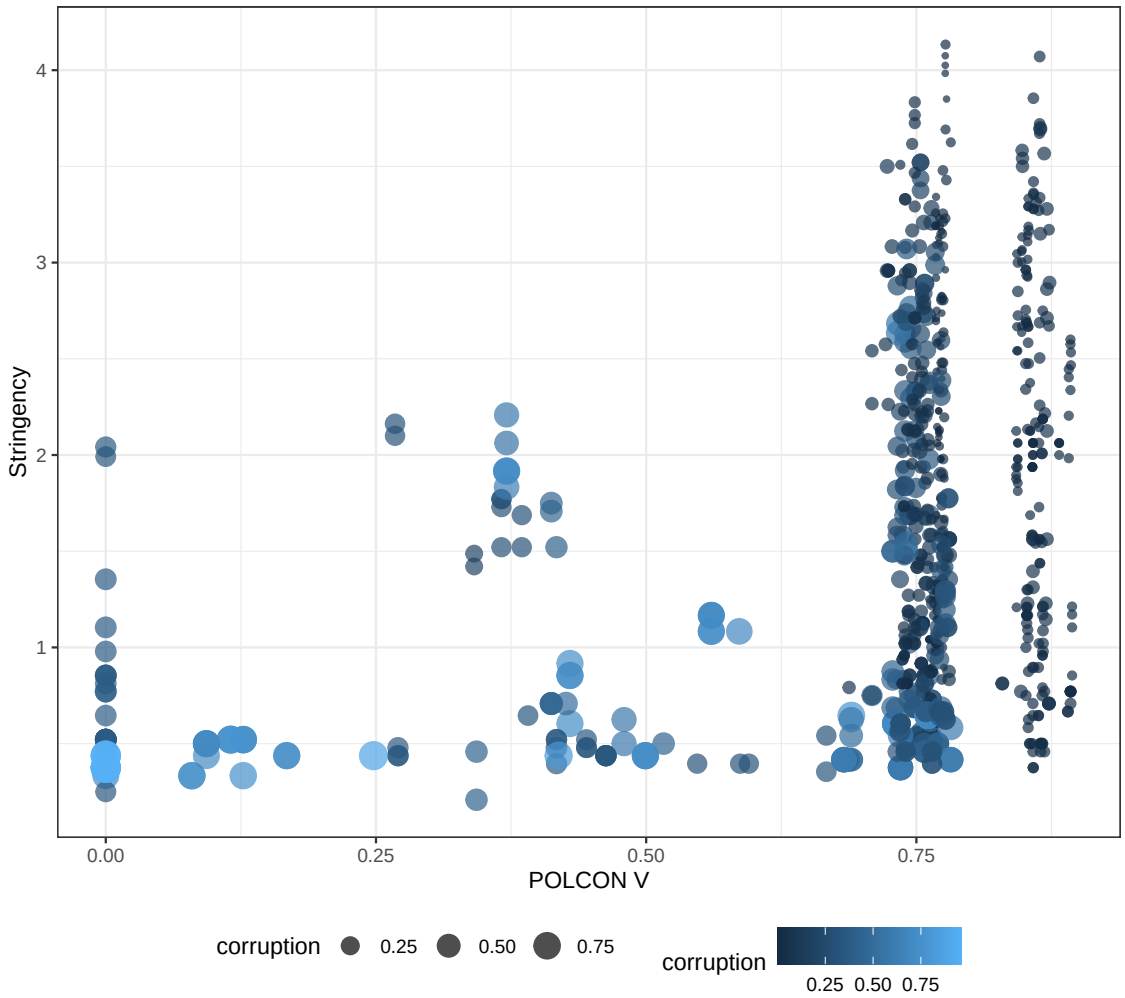

Figure C.4: Diagnostic plots for model 7.