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## MASTER THESIS

### **Party Ideologies and the Opinion-Policy Nexus:**

The Relationships of Public Opinion, Party Positions, and  
Government Spending on Environmental Issues

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## ABSTRACT

Scholars have studied the responsiveness model of social policy to public opinion for decades. Meanwhile, in political science, party ideologies are regarded as one of the determinants of policy outcomes. This research put forwards and tests a mediation model where party positions mediate the causal link between opinion-policy, with regards to environmental issues due to its rising saliency in political competition. Three hypotheses are therefore tested. They are H1: There is a direct effect between public attitudes and environmental policy, H2: There is an impact of public attitudes on party positions on environmental issues, and H3: There is an indirect effect between public attitudes and environmental policy, which is fully or partially mediated by party positions. Employing opinion data from the Environment Module of the International Social Survey Program (ISSP), party positions data from the Chapel Hill Expert Survey (CHES), and government spending on environmental protection from Eurostat for environmental policy, several models are fitted under the Structural Equation Modelling (SEM) framework. Results show strong and consistent effects of public opinion on party positions (accepting H2), while rejecting the other two. Moreover, statistical models also suggest that Eastern European states in general use a larger share of their budgets for environment protection activities when compared to their counterparts. The two findings together contribute to studies of party competition, party politics, as well public opinion – public policy.

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## LIST OF ABBREVIATIONS

AGFI	The adjusted goodness-of-fit index
ANOVA	Analysis of Variance
CDU	Christian Democratic Union
CEE	Central and Eastern Europe
CFA	Confirmatory Factor Analysis
CHES	Chapel Hill Expert Survey
CMP	Comparative Manifesto Project
COFOG	The Classification of Functions of Government
CSU	Christian Social Union in Bavaria
EFA	Explanatory Factor Analysis
EMOs	Environmental movement organisations
EP	Environmental protection
ESS	Eurobarometer Special Survey
EU	European Union
FPD	Free Democratic Party
GDP	Gross Domestic Products
GFI	The goodness-of-fit index
ISSP	International Social Survey Program
IUCN	International Union for the Conservation of Nature
MARPOR	Manifesto Research on Political Representation
ML	Maximum Likelihood
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
OECD	Organisation for Economic Co-operation and Development

RMR	The root-mean-square residual index
RMSEA	The root-mean-square error of approximation
SEM	Structural Equation Modelling
SPD	Social Democratic Party
SR	Structural regression
ULI	Unit Loading Identification
WWF	World Wildlife Fund

## 1. Introduction

In recent decades, especially since the 1960s, signs of environmental degradation have raised a common concern among humankind (Dunlap 1991). Dunlap's findings showed an upsurge of public awareness in the last four decades and people started to call for actions in the US. However, the US is not the only case in the discussion around environmental issues. Environmental movements are not strange to Europe since the very first movements calling for environment protection emerged here in the late nineteenth century (Dalton 1993). Such environmental movements have left an imprint on not only public awareness but also on politics, reflected by recent success of several Green parties around Europe. As such, environmental issues have become more central to scholars who are interested in public opinion, its policy preferences, and the effects it exerts on policy outcomes. The participation of Die Grünen (the Greens) in the German government in the 2000 federal election is an example. The coalition of Social Democratic Party (SPD) and the Greens proposed a plan to terminate many nuclear power plants until 2020. Nevertheless, the plan was postponed due to the takeover of the coalition of CDU/CSU and the FPD in the government in 2009. It was only restarted after the severe damages caused by the Fukushima nuclear power plant in Japan after the earthquake in 2011 (Rohrschneider and Miles 2015: 620). This example is twofold. On the one hand, this case reflects the success of Green parties to have seats in the parliament and their influences on new issues such as environment protection. On the other hand, the policy tends to change in accordance with the change of governmental orientations, implying that partisanship plays a quite important role in the adoption of public policies.

In addition, scholars (Stimson, Mackuen and Erikson 1995; Wlezien and Soroka 2002; Manza and Cook 2002; Breznau 2017) have published myriad studies on the opinion-policy nexus with an attempt to address the level of congruence between the public opinion and public policy through decades. Regarding environmental issues, environmental movements calling for wildlife protection in Western Europe could explain the adoption of new environmental laws (Dalton 1993). Similarly, in Eastern Europe, protests against the construction of the Danube dam in Hungary ended with the decision of the incumbent government to suspend the plan (Botcheva 1996). These incidents opened up the possibility that environmental policy is enacted in compliance with public opinion (movements are a form of public opinion).

Therefore, this research embarks on the quest to study the causal relationship between public opinion on environmental issues, measured by survey items from the International

Social Survey Program (ISSP), and environmental policy operationalised using government spending on environmental protection, as well as how this relationship is mediated by political parties' attitudes measured by the Chapel Hill Expert Survey (CHES). This research asks the question: "To what extent do party positions mediate the relationship between public opinion and environmental policy in European countries?".

This research is conducted in a cross-national comparative fashion using a technique called Structural Equational Modelling (SEM), which allows users to integrate multiple factor analyses and regressions into one model. In next chapter, I will discuss historical events regarding the growth of environmental movements, the concept of public opinion, the relationship between public opinion and social policy, and the intervention of party ideologies in this relationship, in both general issues and environmental ones. Hereafter, I hypothesize a theoretical model representing the relationships between three main elements: public opinion, party positions and environmental policy. Chapter 3 then focuses on data and methods, which incorporates details of structural equation modelling (SEM) method and of mediation analysis in the framework of SEM, the selection of variables and their data sources, as well as the specification and identification of the hypothetical model. The empirical analysis contains data visualisations and testing procedures for the precision and validity of the hypothetical model. The two last chapters discuss the impacts of empirical findings and conclude the thesis.

## **2. Theoretical background**

This chapter will cover core theories and literatures that are tentative to tackle the following questions: How did environmental movements begin in the Europe? How has the concept of public opinion been discussed? Does public opinion have an impact on public policy and if yes, to what extent, particularly in the environmental domain? Do partisan differences really matter in the policy-making process? Is the shift of public opinion congruent with the change in the attitudes of party positions in the parliament? Which scale is better to allocate party positions towards environmental issues, unidimensional or multidimensional scale? Answering these questions will set a firm theoretical base that helps the research take off.



## **2.1 Public opinion on the environmental issues**

### **2.1.1 Environmental movements, conservationism and environmentalism**

#### **2.1.1.1 The environmental movement in industrial democracies: a brief history**

##### ***Environmental movements in Western Europe***

Although environmental protection is nowadays a global issue, the origin of environment protection movements can be traced back to Western Europe. It began in the second half of the nineteenth century after citizens in Western European nations gradually recognized the consequences of the Industrial Revolution on the environment (Dalton 1993). Dalton (1993) provided a detailed account of historical events from the first days of environmental movements in Western Europe. According to the author, environmental movements first began with groups of volunteers calling for wildlife protection and nature conservation. Effects of urbanization and industrialization on wildlife and the ecology in general had led to a surge of concern among natural scientists such as biologists and botanists as well as the increasing participation of citizens in “natural history societies” (ibid: 42) where fundamental movements regarding environmental protection are established. This movement later gained more momentum and expanded beyond the realm of scientists, pushing politicians and elites to take actions. This was particularly the case for France, Germany, Britain, Holland, and Belgium; meanwhile, southern European countries, however, showed little interest in the movement because they were still lagging behind in the process of industrialization. Real progress was made when states started to issue legislations on wildlife protection. For instance, the very first bills concerning wildlife protection were approved in Britain in 1886 and later in Denmark in 1894 as a result of protests and the rise of seabird protection communities. Following this trend, an agreement was accomplished between several countries after a sequence of international conferences in 1902. Provided in the agreement are regulations on which birds should be protected. This period also witnessed the establishment of numerous organizations aiming at protecting birds, for example, the Dutch Association for Bird Protection and the German Federation for Bird Protection in 1899, the Danish Ornithological Society in 1906, and the French League for Bird Protection in 1912. After gaining quite some initial successes in bird protection, the focus of environmental movements shifted to preserving wildlife in general, calling for constructions of “historical landmarks” and “the natural

environment” (Dalton 1993: 47). This wave of preservation, unfortunately, was hindered due to the two world wars. Nonetheless, fast industrial developments and recovery efforts in the post-war period quickly led to the emergence of new environmental issues such as oil leaks in the ocean or mass extinctions of wild animals. Consequently, despite all the positive outcomes gained in the last century, the discontinuity of environmental movements posed a challenge to the re-establishment of environmental issues.

After the end of the Second World War, as Western Europe countries were expanding efforts to rebuild, environmental movements took the opportunity to re-emerge as well. A great number of organizations were thus created in Britain as well as on the European continent. Noticeably, the movement eventually reached Southern Europe, spreading to Spain and Italy in the 1950s. In order to highlight the revival of environmental movements, Dalton (1993) mentioned some then prominent organizations such as the *Nature Conservancy* founded in Britain in 1949, the *Italia Nostra* in 1955, the *German Nature Protection Ring* established in 1960, and the *Swiss League for the Protection of Nature* in 1946, along with the continuity of other existing organizations. Since the 1960s, Western Europe witnessed a remarkable change of its political culture (Müller-Rommel 1985; Rohrschneider 1993; Dalton 1993), when environmental issues arose as a salient topic for political discourses. The environmental movement as a whole turned out to be one of the most successful movements of this century, mostly in “advanced industrial democracies” (Dalton 1993: 41; Mertig and Dunlap 1995: 145). The development of this movement gradually created impacts worldwide, yet there was not a central actor that could hold and mediate discussions on the international level. As a result, the *International Union for the Conservation of Nature* (IUCN) was born. The IUCN, according to European conservationists, showed its functional limitations, so the *World Wildlife Fund* (WWF) was created as a replacement with strong affiliations with Western European countries (Dalton 1993: 49).

The 1960s was seen as a milestone to mark the potent revival of environment movements thanks to the foundation of many new environmental non-governmental organizations and environmental movement organizations (EMOs), as well as the relentless activism of existing environmental organizations such as WWF, bird protection societies, and nature conservation associations. After enjoying a decade of rapid growth between the 1970s and the 1980s, an unexpected decline happened in the following years. Rootes (2008: 2) presented three “tales” behind this situation or three causes thereof: the specialization of EMOs, the institutionalization of environmental movements, and new issues created by protests run by

“the new and more radical groups” while established EMOs deserted the streets for indoor debates. Among the three, Rootes also emphasized institutionalization as the main reason for the downward trend of environmental movements. In fact, the initial involvement of EMOs in the policy-making process proved that environmental activists and governments were working effectively together, resulting in the fall in the number of protests. Such developments, however, brought concerns within EMOs as environmental organizations questioned their identities and expressed worries that their voices and influences on some significant issues might be lowered as the institutionalization process went on (van der Heijden 1997: 46). Environmental protests thus rose again more dramatically as a reaction to this “institutionalization of environmentalism” (Rootes 2008: 5).

Telling the story of environmental movements in Western Europe, it is impossible not to mention the role of the European Union (EU). In the 1960s, the EU started to realize the importance of environmental problems, so they brought this issue to a transnational level and gained some achievements (Rootes 2008). In 1970, the Council of Europe announced this year as the “European Conservation Year” with an aim to raise public awareness. Myriad actions taken in the following years further demonstrated how serious EU members were when tackling environmental problems, notably in the United Nations Conference on the Human Environment taking place in Stockholm in 1972 (Dalton 1993: 52).

### ***Environmental movements in Central and Eastern Europe***

Environmental movements not only grew in significance in Western Europe, but also made an impact to Central and Eastern Europe (CEE). Unlike in Western Europe where environmental movements have widely spread, such movements in CEE countries show a distinctive pattern. Environmental movements in this region thrived dramatically within the 1980s, then started to decline later (Manning 2007). Furthermore, in spite of signs of environmental degradation shown for many decades, data and information concerning environmental situations and actions in CEE countries became more available only after 1989 - the year of the collapse of the Soviet Union and a series of events, of which opposition movements towards environmental issues was a part (Jenkins 2007; Rootes 1997: 335). For instance, environmental movements in Romania only started from 1989 because the Romanian extreme government manipulated and controlled information on environmental degradation, leading to the citizens being unaware of environmental problems (Botcheva 1996: 300).

The featured severe damages to the environment in CEE countries should include the “phosphorite war” in Estonia, air pollution in the Bulgarian town of Ruse, the pollution in the town of Copsa Mica in Romania (Manning 2007; Botcheva 1996: 296). These incidents can be accounted for by different causes. According to Jenkins (2007), one of the reasons is the inconsistency between nations in addressing the environmental consequences caused by industrialization. Another reason posited by Turnock and Carter (2002) is the lack of sustainable technologies of eastern Europe in comparison to western Europe, tagged along by the inefficiency consumption of raw materials and energy. At that time, the primary economic sector of CEE countries was the classical heavy industry, whereas western countries had shifted into services and high-tech manufacturing (Turnock and Carter 2002: 7).

According to Bochetva (1996), not until 1989 did environmental movements in countries like Hungary, Slovakia or Bulgaria gain some attention. Specifically, there was a joint project called the Gabčíkovo-Nagymaros Barrage System on the Danube signed by the government of Hungary and Slovakia in 1978, which was partly financed by Austria. Realizing the harm of this project to the environment, environmental groups, notably the Danube Circle, organized protests against the construction of the dam. The suspension of the project on the Hungary side decided by the government proved the partial success of environmental movements in this country. The plan of the dam on the Slovakia side was hence terminated. As for the case in the Bulgarian town of Ruse, the contamination of air caused by a chemical plant in Giurgiu - a city of Romania located on the other side of Danube made Bulgarian citizens in Ruse suffer from various health issues. Expecting actions on this situation from the government, environmental movements had taken place in different forms such as peaceful demonstration, signing petitions and newspaper publications (Botcheva 1996: 299). Consequently, the chemical firm had to shut down one of the main producing chlorine plants in Giurgiu. Although the problem was not completely solved, it showed that efforts of environmental groups had been partially compensated. Additionally, Bulgarian environmentalists faced difficulties in conversing with their Romanian counterparts because information was controlled by the Romanian government, which gave Romanian citizens underrated insights about the level of issue seriousness (ibid: 300).

Despite gaining some success in the 1980s, the weakening of environmental movements was reckoned after the dissolution of the Soviet Union in 1989 (Rootes 1997). In the context of political transformation and economic reconstruction, or in Baker’s (2002) words the process of “democratisation” and “marketisation” (Baker 2002: 22), environmental

movements were manoeuvred as a resistance to the regime and environmental values were seen as peripheral. This is the case of Bulgaria when its environmental movements made an impact on “the communist monopoly of power”, while protests on environmental issues in Hungary happened on a pretty modest scale (Rootes 1997: 336). Hence, although this is a two-fold movement targeting both environmental and political reforms, the commitment of environmentalists to a transformation appeared negligible. Moreover, environmental movements in most CEE countries during the early 1990s revealed both their weaknesses as well as the lack of resources and internal funding (Fagin and Tickle 2002: 46), which posed a real challenge in reforming environmental governance. Looking at the case of the Czech Republic, even though environmental organisations were funded by the “new dissident-led administration” and they spread their influence by joining renowned international groups in the early 1990s, the state becoming less supportive and more conservative after 1992 led to restrictions in the activities of these organisations (ibid: 51).

In general, environmental movements in West and East Europe have shown quite different patterns. The recognition of environmental deterioration as a social problem in CEE countries is even believed to be an outcome of the conversation between West and East since the second half of the 1970s (Fagin and Tickle 2002: 42). Nevertheless, although environmental movements were relatively successful in Western Europe and were fluctuated in Eastern Europe, the rationale behind these outcomes lies in multiple factors. Among these factors, general support of the public or public attitudes towards environmental problems is commonly believed to be one of the cornerstones and has therefore attracted a variety of research on both national or cross-national scales (Mertig and Dunlap 1995, 2001; Hofrichter and Reif 1990; Rohrschneider 1990; Inglehart 1995; Suhonen 1993). Apart from relentless efforts to impact national governments as well as EU institutions (Rootes 2008: 13), one of the most powerful instruments that environmental organizations and activists have been using to achieve their goals is by influencing public opinion (Mertig and Dunlap 1995: 145). The different nuances of public opinion will be reviewed in detail in section 2.1.2. Leaving that aside, due to the aforementioned evolution of the movement at the turn of the twentieth century, it (the movement) has reached far beyond its initial objectives of wildlife protection and nature preservation. This fact calls for a more thorough discussion on the two terms: conservationism, which was commonly used before wars, and environmentalism, which has been perpetually mentioned since the 1960s.

### **2.1.1.2 Conservationism and environmentalism**

It is worth asking whether there are differences between conservationism and environmentalism, or one is just another expansive version of another. In fact, Dalton (1993) merely used the term environmentalism until he got to the 1960s. There, he provided an insight into how the emergence of new environmental issues such as nuclear power, acid rain, toxic waste, resources shortages asked for more realistic solutions than purely conservation or preservation. Environmentalism, in Dalton's perspective, is composed of conservationist actions along with other environmental solutions. Mertig and Dunlap (2001) also pointed out that conservationism and environmentalism were just two branches of contemporary environmentalism. More particularly, conservationism is thought of as "being primarily interested in the preservation of wildlife and aesthetic environments", while environmentalism "encompasses the broader goal of environmental protection and entails a more exacting critique of the status quo" (Mertig and Dunlap 2001:115). In the perspective of Dalton (1993) and Mertig and Dunlap (2001), environmentalism is more suitable for the highly advanced stage of industrialization, which has brought about unprecedented environmental problems. Furthermore, environmentalism, whose characteristics are similar to other social movements such as feminism, anti-nuclear power, peace or animal rights movements, is considered as a "new social movement" (Mertig and Dunlap 1995). As a result, political conversations of the public started to tackle this new issue (Rohrschneider 1990). Although the dissimilarity is pretty obvious, it is interesting to learn how differently the general public perceives conservationism and environmentalism: whether the public made the two as separate aims or integrated them as one contemporary environmentalism. Mertig and Dunlap (2001) found that the level of environmentalism's approval was just slightly higher than that of the traditional one, if not to say equal. Due to the incomparable significance between the older and newer elements, the two themes should be put under one umbrella term called contemporary environmentalism.

### **2.1.2 The concept of public opinion**

Public opinion is not a novel concept with already myriad studies on this matter, yet studies trying to define public opinion repeatedly stressed how ambiguous this term could be (Noelle-Neumann 1995; Allport 1973; Herbst 1993; Lazarsfeld 1975; Smith 1996, Hoewe 2016). Generally defined, public opinion can be understood as a self-expression of individuals to support or oppose concerned public issues (Allport 1973). The instruments which citizens use to publicly express their concerns are also diverse (Manza and Cook 2002: 632), for

example through polls and surveys, in public places, or through social movements. Although the aforementioned definition and instruments show quite a general, simple and literal meaning of public opinion, generalization and simplicity in construing a concept might result in overlooking the research. The concept of public opinion therefore deserves a more thorough scrutiny, through varieties of approaches such as public opinion's classification (Herbst 1993; Lazarsfeld 1957); distinct natures of public opinion in separate models (Noelle-Neumann 1995; Scheufele and Moy 2000) or sentiments from different academic disciplines such as sociology, psychology and political science (de Boer 2007). This work, however, does not seek to understand the nature of public opinion or to reconcile various methods of conceptualization. Thoroughly reviewing it only helps readers fathom the complexity of the concept, as well as provide a basis for the theoretical models specified later in the analyses. The goal here is to go through many approaches despite the concept's variation through times and to find the most accessible and understandable.

One of the first thorough and insightful reviews of the many layers of public opinion is probably the pivotal work of Lazarsfeld (1957), which distinguishes between classical and empirical approaches to public opinion. While classical theorists put a greater focus on the nature of public opinion, pondering very abstract and largely unanswered questions regarding the makings of the concept, scholars of more recent times tend to simplify the concept and apply an empirical, data-driven approach to studying public opinion. In other words, in Lazarsfeld's view, there has been a clear trade-off between complexity and applicability among public opinion scholars. In fact, Herman Oncken, a famous German historian belonging to the classical school, portrayed public opinion as "a complex of similar utterances of larger or smaller segments of society concerning public affairs" with many contradictory features such as "spontaneous" or "artfully manipulated", publicly expressed or unspoken thoughts, "united" or "divided", etc. (Lazarsfeld 1957: 42-44). Nevertheless, the qualitative approach that classical researchers preferred was not capable of fully interpreting the multitude of nuances of public opinion that Oncken described. For that reason, public opinion scholars in modern times tend to avoid these puzzling questions. Instead, in their view, public opinion should be defined simply as the distribution of attitudes. The concept of public opinion has clearly been made more straightforward and inclusive by modern empiricists, who are fortunate enough to be equipped with much more high-quality survey data that can to a certain extent capture a part of what is believed to be public opinion. The downside of using survey data and quantitative methods in studying public opinion, apparently, is the complete reliance on what have been

sampled in secondary surveys, which are usually multiple-choice questions with little room for interpretation. That being said, for the time being, there is no better option but to use secondary survey data if one does not want to delve into endless discussions on theoretical concepts, unless one could afford to conduct high-quality surveys/interviews that are specifically designed to suit one's needs. Therefore, for the sake of this dissertation, the assumptions that I have to make in order to move forward are that public opinion exists and that distributions of attitudes collected from mass surveys are representative samples of it. Making such assumptions does not imply that theoretical discussions are not important; rather, stating them out only means I fully acknowledge the unavoidable shortcomings of the empirical approach I am taking.

Instead of drawing a clear line between older and newer generations of public opinion researchers, Herbst (1993) provided a more inclusive outlook of the debate by pointing out four distinct groups of interpretation: "aggregation; majoritarian; discursive or consensual; and reification" (Herbst 1993: 439). The first group (Page and Shapiro 1992), regarded as the most ubiquitous, considers "polls, surveys, elections and referenda" as major means of public communication and therefore public opinion is believed to be the aggregation of individuals' opinion on certain issues, hence the term aggregation. Meanwhile, the majoritarian strand believes only social issues which are of great significance to the majority and which attract the greatest number of shared perceptions should be thought of as public opinion. The third group (Habermas 1989), on the other hand, highlights the fluctuation of people's opinion in different conversations rather than the consensus on certain issues. Finally, the reification group, notably Bordieu (1979), outright states that public opinion is basically non-existent and that this concept is merely a product of the media or politics. The classification of Herbst is just one of many different ways of conceptualising public opinion. However, considering the popular use of polls or surveys in public opinion research (Weaver 2008; Agnone 2007; Dunlap, Gallup Jr. and Gallup 1993), the first group perceiving public opinion as a cluster of different public expressions seems to rule out the remaining groups.

Another attempt to classify public opinion is given by Noelle-Neumann (1995), in which he demonstrated two functions of public opinion: public opinion as rationality and public opinion as social control. This classification is based on 50 definitions of public opinion defined by Childs (1965). Public opinion as rationality, which serves the manifest function, is founded on "the notion of the rational, well-informed citizens" (Noelle-Neumann 1995: 43) who are able to give solid arguments on political issues. Meanwhile, public opinion as social control



influences all members of society in every area. This concept could be explained by the theory of spiral of silence (Noelle-Neumann 1974). It is theorised that pressure of societies is placed on those who become silent because of being threatened with isolation when they shift away from the unanimity and those who choose to speak out as they are afraid of being isolated (Noelle-Neumann 1995: 41-42). Scheufele and Moy (2006) distinguished public opinion as rationality from it as social control at three points. The first point is the different methods of opinion expression. While public opinion as rationality is verbally and relationally expressed with a focus on political life and political debates, the other employs all forms of expression (verbal, facial, gesture, etc.) in all facets of society. The extent to which public opinion could be expressed is the second distinct point. In particular, due to the demanding level of rationality, the discussion is indeed driven by “a small group of informed and interested people” (Noelle-Neuman 1995: 43) despite the participation of all citizens. In contrast, unconscious expression is the feature for the effort of opinion expression in the social control model. The last difference is how Noelle-Neumann conceptualised the term “public”. In other words, the public in the rational model represents a group of well-informed people having interests in politics, while in the social control model, the public implies all members of society. Nevertheless, according to Noelle-Neumann (1995), the concept of public opinion as rationality has become more dominant since the 19th century (Noelle-Neumann 1995: 41). The preference of this rational concept is because the manifest function helps it be identified in a simple way. Whereas public opinion as social control holds the latent function which is characterised as “unintentional” and “unconsciously recognised”, leading to the sometime misinterpretation of the concept (ibid: 49).

Looking at how public opinion is perceived in different academic disciplines including sociology, psychology, political science and communication science, de Boer (2007) showed how these disciplines emphasize individuals, collectivity and the communication process, respectively. According to de Boer, psychologists place their focus on “the process of opinion formation” as well as “the factors that influence individual opinions”. This individual focus proves to be problematic when being examined in a broader framework, with the participation of social and political factors, as psychologists do not consider themselves as “a social force” (Smith 1971). From the sociological standpoint, public opinion is investigated at the collective level, whereas political scientists view it in the framework of the political system (de Boer 2007). Due to the political-oriented nature of this work (the inclusion of party positions), it is more appropriate to, hereafter, place a greater emphasis on political scientists’ worldview. As

such, public opinions from various societies are not only different because of individual or demographic factors but also due to the political economic setting of each society. This is particularly important for the construction of both theoretical and statistical frameworks and will be elaborated further in later sections.

Recently, Hoewe (2016) conducted a survey to understand how political journalists understand public opinion, based on Herbst's (1993) classification. The result yields two contradictory perceptions: one optimistic and one pessimistic. Particularly, the former sees public opinion as "a societal agreement", "a meaningful entity for gauging attitudes", and "the aggregation of individual views", while the latter group perceives it as a controlling political instrument and believes that only voices from the most salient groups are heard (Hoewe 2016: 250). Determining whether to fall to either side is crucial for the interpretation of this research. For instance, if findings support the hypothesis that a sample of the public consisting of people from all walks of life actually has impactful influences on the government's decisions, one might conclude that public opinion is indeed the collection of individual attitudes and that it matters. However, such a conclusion can easily fall into the trap of post-hoc fallacy, in which results are used as evidence for causes. Therefore, I prefer to restrain from making any debate-settling verdict on this matter, instead inferring only from what statistics suggest.

Having provided an eagle view on the topic, it is clear public opinion is an abstract and intangible concept that has existed and been transforming for decades. Yet, public opinion as the cluster of public attitudes expressed by a group of individuals in the society is believed to be more dominant (Herbst 1993: 439, de Boer 2007). Regarding the complicated ways to address public opinion such as public attitudes, public awareness, people's awareness, community/public sentiment, public preferences, or general support/opposition, I, however, prefer to use henceforth the term in plural form in order to stress the different degrees of support/opposition people have towards a specific issue, which is environmental issues in this case (Dunlap, Gallup Jr. and Gallup 1993; Smith, Kim and Son 2017). Specifically, terms such as public attitudes or public preferences will be used interchangeably.

### **2.1.3 Public attitudes towards environmental problems**

The relationship between public opinion and social movements regarding environmental issues is reciprocal, or at least has been shown to be so by Mertig and Dunlap (1995) and Banaszak and Ondercin (2016). Although reciprocal relationship is not the focal point of this research, it signifies that these two concepts should be analysed relative to each

other. As mentioned earlier, the environmental movement in recent decades has achieved some concrete goals, notably helping drive public attitudes into pro-environmentalism. In general, research on this matter on the international scale, especially in advanced industrial countries, indicate quite similar results: public attitudes vary between countries and the awareness of environmental issues are becoming more and more serious (Inglehart 1995, Franzen and Vogl 2013). Moreover, public attitudes usually change in accordance with social and political turbulences. For instance, Dunlap (1991) divided trends in public opinion towards environmental issues in the US from 1965 to 1990 into three main stages. In the first stage, between the 1960s and the 1970s, the level of concern on environmental problems surged to reach its peak with the first Earth Day in 1970 before suffering a sudden fall in the first years of the 1970s, in sync with the oil crisis, before gradually, but not significantly, growing back up. Afterwards, support for environment protection has mainly been going up as people are becoming seriously aware of environmental degradation. The emergence of new social movements regarding the deterioration of the environment, along with waves of feminism and the peace movement have changed the political priorities of the public in Western countries entirely (Inglehart 1990, 2017; Offe 1985). In Eastearn Europe, environmental degradation sparks concern among citizens but to a lesser degree compared to the West, considering the context in the 1990s when economic development and labour issues are still the most salient (Lee and Norris 2000).

Nonetheless, there is not enough evidence to entirely unfold what the real motives behind such changes are (Anderson, Böhmelt, and Ward 2017: 8). It is, thus, only possible to describe under what circumstances environmental attitudes have become more or less supportive. For instance, Inglehart (1995) presented the two conditions in which we usually witness a rise in the level of environmental support: one is when people actually feel the consequences of environment deterioration, and the other is when people are living in less polluted countries such as Scandinavian countries. There, “post-materialism” is believed to be the impetus that makes people proactively root for stricter environmental measures. Post-materialism is a new term created as a phenomenon after “a prolonged period of affluence and physical security” and “the economic security being taken for granted”, which involves non-economic factors or “life-style issues” (Inglehart 1977: 262-290). However, it is also suggested that the shift of environmental attitudes into pro-environmentalist is not necessarily contingent on national wealth or on “affluence-based post-materialist values” (Dunlap and York 2008).

On the contrary, environmental opposition emerges as a response to the government adopting more environmental-oriented policies, for instance, the case in the US and in Britain. The opposing movement on land usage in the US, also known as the wise-use movement, exemplifies this viewpoint. This movement came after the global recession of the 1980s and is believed to have served two purposes: challenging the role of the federal government in shaping environmental policies and expressing the discontents of American citizens on the West who were treated less just due to the exploitation and overcapitalization from the East (Switzer 1997: xi-xiii). Because of its call for extended access to public lands, this wise use movement has been termed by environmentalists as being an extremely “anti-environmental movement” (Jacobs 1995: 3). The same happened in Great Britain in the 1990s when the British government planned to enact an environmental policy concerning contaminated land (Smith 1999). Despite the fact that consequences of contaminated land were related to ecosystem and health issues, calling for advances in environmental policy to tackle this problem, the execution of this law in Britain took more time than expected. Responsibility for this delay fell on both the legislative process and property industry. On the one hand, there were flaws in the Environmental Protection Act 1990 such as the misapprehension of concepts, i.e. “contaminated land” and “land subject to contaminative use” (Smith 1999: 379). On the other hand, the opposition of the property business to the policy, which is due to the fear of the property bubble, partially affected the governmental decision on postponing the implementation of the Act, as the 1992 General Election was forthcoming and the government had to consider their opinion.

Although there have been myriad works on public attitudes on environmental issues, scholars frequently pick the US as the case study (Agnone 2007; Dunlap 1991; Weaver 2008) or conduct comparative analysis using cross-national data (Inglehart 1995; Bloom 1995; Dunlap, Gallup Jr. and Gallup 1993). Therefore, the heed should be paid toward European countries for two reasons: first, the US as a society cannot represent the various socio-political systems of the Western world; and second, both Western and Eastern Europe make themselves interesting cases when it comes to environmental movements. Western Europe has “a supranational governance structure for most countries” as well as an absence of major doubts about climate change and environmental degradation (Anderson, Böhmelt, and Ward 2017: 2), but a pretty high level of scepticism regarding their political institutions (Lee and Norris 2000: 376). In the East, shifts of public attitudes toward environmental issues show not only the public’s concern on the quality of the environment, but also how people manoeuvre

environmentalism as an indirect tool to express their discontent with the government on other issues. This phenomenon is believed to be a consequence of the nature of post-communist regimes where protests aiming to criticize the state and the ruling party are often regarded as “a criminal act” (ibid: 376). As a result, studying public attitudes toward environment protection in Europe instead of the US not only provides another account on the topic but also reveals how different institutions with distinct historical, social, and political structures can introduce very unique pictures of pro-environment movements.

## **2.2 The opinion-policy nexus**

### **2.2.1 The conceptualization of policy**

Policy is a broad term that requires a specification of what it means in this research. Although the statement that “policy is the sum total of laws and regulations regarding the particular set of issues” is claimed to be one of the most common definitions (Erikson, Mackuen and Stimson 2002: 285), the meaning of the term is seemingly more complicated than that. For instance, in the same writing, Erikson, Mackuen and Stimson (2002: 286) provided three different understandings of *policy*: policy can be thought of as “the sum of policy enacted over time”, “the changes to policy that engage the national debate”, or “the consequences of policy in terms of the effects on people’s lives”. In other words, when addressing policy, especially in relation to factors causing it, scholars have to be careful so as not to confound one definition of policy with the other. While the aggregate of all policies on a particular issue over time simply shows how policies in that area have evolved, any significant change in policy that creates controversies in the public as well as among policy makers could herald structural transformations within the governing body. Meanwhile, using consequences of a policy change to represent that policy change can be at times problematic as it is extremely rare for any event to be caused by solely one factor.

In similar fashion but with more attention to details, Guba (1984: 63) proposed three ideal types of policy along with eight different interpretations, each specific to only one category: “Policy-in-intention”, “Policy-in-implementation”, and “Policy-in-experience”. Guba’s typology basically differentiates the three stages of policy making, from planning to implementation to experiencing the consequences of newly adopted policies. Being specific about the stage of policy making one is referring to could help both the researcher(s) and the readers understand the limits to which inferences from statistical tests can be drawn. For instance, if a model estimates effects of increasing support for stricter environment protection

measures on traditional farmers' average income, this model does not imply a direct causal relationship of opinion and policy; rather, it suggests how a mood change of the public regarding environmental issues might influence several socio-economic factors, which in turn moderate the average income of farmers. On the other hand, intentions, while essentially much more connected to public opinion, are also harder to grasp due to the enormous number of agents involved in the policy-making process. Practically speaking, working with the implementation phase would be the most appropriate if one does not care about how policies come into existence nor what they bring about but simply the actual, tangible responses of the government to internal and external factors. This point is particularly crucial for the framing of this work.

Guba's categorization, however, is yet to be considered as the ultimate guideline to studies of this field. In terms of policy typology, most scholars refer to the work of Lowi (1964). In particular, public policies are classified based on their functionalities into three types: distribution, regulation, and redistribution. While regulatory and redistributive policies are enacted in the long term, distributive policies are made in the short term. Environmental policies do not only belong to one category in this case because the allocation of resources to environment protection activities, despite being a distributive measure on the surface, could also hold regulatory and redistributive implications in the long run, as there have been evidence of how reforms of environmental policies could affect businesses (Rivera and Delmas 2004; Hart and Ahuja 1996; Dowell, Hart and Yeung 2000) and consumers (Kumar and Ghodeswar 2015; Tonner 2000), as well as the economy and the society as a whole (Brand 2012; Bezdek, Wendling and DiPerna 2008). This again stresses the importance of studying environment policy in today's world.

### **2.2.2 Research on the opinion-policy nexus**

Public opinion is the aggregate of individuals' attitudes expressed through public communication channels (discussed earlier), whereas public policy is widely believed to be a manifestation of the degree of efficiency or deficiency in the communication process between the public and the government (Erikson, Mackuen and Stimson 2001, chapter 8: 284). This shows how relevant the question on whether there is a relationship, especially a causal or even reciprocal one, between public opinion and public policy over time is in the literature. In democratic nations, this relationship is considered as one of the major goals of a healthy democracy (Rasmussen, Reher and Toshkov 2019: 412). In the work of Lazarsfeld (1957: 50-53), he suggested that research on the relationship of opinion to policy should receive more

attention than before. There, Lazarsfeld reiterated some historical events in which the opinion of the mass had had influences on national governments in Europe in the late nineteenth century to show how early this relationship had been established. In fact, politicians should have very strong incentives to adjust policies according to the opinion of the majority, especially in periods prior to elections. For example, Stimson, Mackuen and Erikson (1995) have once proposed the “dynamic representation” model to illustrate this theory, describing the ways public policy responds to changes of public opinion in the US. Their explanation for this phenomenon is that political actors are constantly “sensing” shifts of public opinion and only make in part changes in their policy behaviour, or in their words, make alternatives “at the margin” (Stimson, Mackuen and Erikson 1995: 543). The validation of the model requires the measurement of change of public opinion and policy. Shift of public opinion was measured by the longitudinal data of domestic policy mood and policy change, presumed as latent construct, was weighed by different observed indicators of annual congressional policy output. With the application of the time-series regression, the hypothesised dynamic representation model is proved affirmative. However, there are variations of the congruence in institutional level and mechanism, according to the authors (Stimson, Mackuen and Erikson 1995). In a later work (Erikson, Mackuen and Stimson (2001), the authors attempted to replicate the results and build a model stimulating the opinion-policy link that works on both micro and macro level. To differentiate micro and macro level, for instance political behaviours of voters (micro) and electorate (macro), the authors explained that the micro approach focused on each individual, while the changes of the whole group over time was observed in the macro level. The process to build the model can be divided into two stages: micro and macro model, which made the analysis more convincing compared to their earlier but pretty similar research (Stimson, Mackuen and Erikson 1995). The result shown is not different by the strongly congruent responsiveness of policy to opinion, which varies in institutions. Similar findings have also been found at the state level (Erikson 1976), on the nationwide scale with longitudinal data (Page and Shapiro 1983), and even at the cross-national level, i.e. Europe (Rasmussen, Reher and Toshkov 2019). To a further extent, Manza and Cook (2002) probe deeper to the policy-opinion link by assessing the degree of its effects. Particularly, they found that public opinion strongly influenced public policy in the US and divided this impact into three types of effect including “strong”, “weak” and “contingent” effects. The two scholars, however, pointed out the limitations of both strong- and weak-effect models. Models with strong/large effects lead to the exaggeration of the congruence due to the biased selection of sample or over-aggregation, whereas the ignorance or inconsideration of the impact on high salience issues makes light of

the congruence in small-effect models (Manza and Cook 2002: 651). Therefore, they sought more plausible explanations by approaching contingencies, where they found the best understanding of the opinion-policy nexus. There, they highlighted that the variation of public opinion leading to the different degree of policy change in response depends on specific domains which are referred to as a contingency.

The line of research presented above, also known as congruent responsiveness in opinion-policy literature, is one of the three prevalent streams of literature dissecting the opinion-policy nexus, the other two being the feedback models and the (simultaneous) reciprocal models. In other words, researchers studying opinion-policy have gone far beyond the one-way effects of public opinion on policy and started to theorize how policies can actually shape public opinion (feedback), or together form a two-way loop (reciprocity). Besides, there are also scholars who do not believe in permanently established relationships but instead focus on discontinuations of responsiveness, yet this strand of literature is not popular enough to form an independent stream equivalent to the others. In the next paragraphs, I will go through each of the other two groups of literature and explain how they, the first group included, can be used to formulate my theoretical framework.

Scholars who advocate feedback effects of policy on opinion posit that public policy is in fact a tool politicians make use of to manipulate the public and gain support. One of the first feedback models described in the literature is that of Pierson (1993), in which he theorized a set of mechanisms where public policies concurrently generate “resources and incentives for political actors” (Pierson 1993: 597) and act as sources of information, or “cues” (ibid: 619), based on which various political and interest groups as well as the mass public understand the political landscape and react accordingly. Pierson (1998, 2000) demonstrated a model of increasing returns, where the more generous welfare states are, the more supportive the public is of redistributive policies. The contrary is also true: when states become less generous, people get used to the idea of not receiving benefits from the government and thus turn against the idea of redistribution. Meanwhile, Wlezien (1995) had a different outlook on the same matter. He suggested a thermostatic model of the public in which public opinion functions as a thermostat that senses and balances out every change in policy, hence a negative relationship. Put differently, whenever the government expands and contracts welfare state benefits, the public will always react in the opposite direction. As such, feedback effects are commonly classified as positive and negative strands (Fernández and Jaime-Castillo 2013). Nevertheless, Busemeyer, Abrassart and Nezi (2019) criticise on the positive/negative distinction of feedback



effects for its possible misunderstandings and hence create a new model called “a more fine-grained typology” of feedback effects based on the differentiation of three dimensions. The first dimension involves the direction of feedback in which the pattern of public opinion moves in “accelerating”, self-reinforcing” or “self-undermining” dynamics; the second dimension is the broadness/scope of feedback inquiring whether the effects are measured at general levels (state/government) or at specific levels (policies/policy change); and time is the last dimension where feedback effects are observed whether in the long-run or short-run periods (Busemeyer, Abrassart and Nezi 2019). Indeed, this newly proposed typology of the three authors has expanded the typological boundary of feedback effects to a larger scale instead of the frequent dependence on the traditional positive/negative distinction.

While the two above-mentioned streams solely focus on the single-directional effects between public opinion and public policy, there is another stream that examines the opinion-policy link in a reciprocal manner. Although Pierson (1993) stated that public policy can always be treated as either outputs or inputs in the opinion-policy link (Pierson 1993: 595) referring only single-directional effects, this statement is also true to reciprocal effects which combine both responsiveness and feedback effects into a model. Sharp (1999) found a “sometime connection” between public opinion and policy. The term “sometime connection” implies the infrequent congruence of public opinion on policy and vice versa, of policy on public opinion. This finding, however, exposes shortcomings because the author barely gives explanation on the reason why there are effects (in both directions) in such circumstances, but not in others (Raven et al. 2010: 371). As such, Raven and her colleagues (2010) developed a reciprocal model of the opinion-policy nexus with a focus on the Netherlands. The result showed two different trends. Regarding policies in new areas, public opinion has a strong influence on such policies, but does not adapt to policy changes. As for traditional or highly institutionalised policy domains, while policy can make changes to the public mass, the reverse impact appears very weak. Therefore, the reciprocal model cannot be established. Instead of building a reciprocal model by testing separately opinion-policy link and policy-opinion link, Breznau (2017) proposed a simultaneous feedback model when two directions of effects happen in the same year, or in his words, “without lags” (Breznau 2017: 583). The specification of his theoretical simultaneous feedback model is founded on lay theories such as Wlezien and Soroka (2007) or Pierson (1998,2000) which provides a firm base for the formation of the opinion-policy reciprocal relation. Using data from the International Social Survey Program (ISSP) to measure public opinion, and government spending and the dataset of

decommodification by Scruggs (2004) for social policy measure, Breznau's hypothesised model gained significant effects and it goes in the direction of extending Pierson's positive returns models.

That said, not all researchers are interested in reciprocity. In fact, many policy studies (Page and Shapiro 1983; Burstein 2003; Stimson, Mackuen and Erikson 1995) that only focus on the single direction of the political process: the impact of public opinion on public policy or policy outcomes. There are many reasons for this, most notably because reciprocal models are rather complex and require real longitudinal data to be statistically proven. Meanwhile, cross-national surveys such as the International Social Survey Program (ISSP) or the European Social Survey (ESS) only repeat a certain module (e.g. Environment, Social Inequality) once every few years, creating a lot of loopholes in the data. Therefore, in this research, I will concentrate only on the direction from public attitudes to public policy. This choice does not mean I reject the idea that policies might, even simultaneously, reshape public opinion; it only shows where my research interest lies. Furthermore, to avoid the limitations of large/small effects presented by Manza and Cook (2002), I will therefore concentrate on a specific issue domain as a contingency, explicitly environment domain. This is because I acknowledge the increasing saliency of environmental issues in the political world. On the one hand, ones have been more aware of environmental degradation and climate change, consequently environmental protections (Lowe, Pinhey and Grimes 1980; Blake, Guppy and Urmetzer 1996). On the other, the emergence of Green parties as well as its frequent participation in the governments, for instance, the Greens party (Die Grünen) in Germany has constantly succeeded to have seats in the *Bundestag* in every federal election since the reunification of Germany in 1990.

### **2.2.3 The relationship of public attitudes and environmental policy**

This subchapter will probe deeper into the opinion-policy link concerning environmental issues. On the one hand, while public policy is a general term indicating all of policies introduced by the government, I have mainly been describing the type of policy involving social issues, so-called social policy, as well as the strong relation between public opinion and social policy, as meticulously reviewed in the previous subchapter. On the other hand, I would argue that environmental policy should never be treated as independent of social policy. According to Wallimann (2013), environmental policy and social policy are two sides of the same coin as sustainability is the ultimate goal. Many social issues such as health, nutrition, migration, and many other issues have been proven to be directly influenced by environmental policy. Conversely, the interaction of humans with the environment regulated

by environmental policy has direct effects to social risks, human survival, and social and economic change (Wallimann 2013: 1-2). For instance, in a concrete discipline such as the food industry, Shafer highlighted the interconnection between agriculturalists and nutritionists (see Willimann 2013, Part 1, Chapter 2). Specifically, agriculturalists are responsible for adjusting the proper amount of nutrients put in plants for healthy growth, and nutritionists take charge in studying how much nutrients of food inputs a human body needs on a daily basis. In other words, when chemical inputs to the soil exceed the “safe” threshold, leading to land contamination, it might cause harm to human health such as increasing the risk of cancers (according to FIRST for Sustainability<sup>1</sup>). This is a vivid example of the intertwined relationship between environmental and social issues, calling for appropriate policies in both disciplines. Therefore, environmental policy perceived as part of social policy provides a solid ground for the assumption that public opinion has a great impact on environmental policy as it does on social policy.

The public opinion - environmental policy linkage, however, is not an entirely novel topic. Weaver (2008) have actually identified some of the limitations of studies on this topic such as the insufficient number of research, the shortage of cross-national studies, or the overconcentration on the US as the case study, which might result in the oversimplification of the issue. Although the increasing seriousness of environmental degradation in the recent years has drawn much more attention from scholars (Agnone 2007; Anderson, Böhmelt, and Ward 2017; Shum 2009), one has to admit that cross-national analyses are still scarce, which is a great opportunity for this research to help fill in the gap. Overall, examinations on the link between public attitudes toward environmental issues and environmental policies suggest both direct and indirect effects, depending on the methods scholars employ to measure public opinion and policy. For instance, instead of focusing on the US, Anderson, Böhmelt, and Ward (2017) provided a cross-national analysis in Europe to see whether the governments react to public demands. By utilizing data on environmental attitudes of the public mass and outputs of renewable energy policy, the authors found a significantly positive correlation in their relationship.

With regard to indirect effects, intervening factors have also been taken into account. Some studies have indicated the extent to which effects of public attitudes, with protests as a

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<sup>1</sup> FIRST for Sustainability, Environmental and Social Issues: Land Contamination <https://firstforsustainability.org/risk-management/understanding-environmental-and-social-risk/environmental-and-social-issues/land-contamination/>. Retrieved on 11/07/2020

covariate, exert on environmental policy. Particularly, both Agnone (2007) and Weaver (2008) confirmed the effect of environmental protests on the opinion - policy relationship, despite different interpretations. Specifically, Agnone hypothesized and tested the joint effect of both environmental movement activities and attitudes on the legislative process. There, he introduced an amplification model of policy in which environmental protests do not rely on public attitudes to exert effects on legislative actions, while public opinion is dependent on the level of protests. In other words, environmental protests both allow and amplify the effect of public attitudes on policy changes. On the other hand, apart from direct effects of public opinion on environmental policies, Weaver (2008) also showed that there is an indirect effect where protests were treated as a mediator. Weaver's findings suggest that there is an underlying mechanism in the relationship between public opinion and environmental policies, thus anything less complicated than a triangular relationship is likely insufficient. One limitation from Weaver's work is that it failed to generalize all theoretical models proposed because results from his statistical tests are scatteredly significant. The author, however, emphasized that "generalization of findings to all countries" or "a complete portrait of the complexity of the relationships between public opinion, protest behaviour, and environmental policy" (Weaver 2008: 122) was never the intentional purpose of his work. Weaver's work and philosophy will form the basis of my theoretical framework. Different from what he did, however, I posit that parties and their ideologies should be the mediator, the reason for which will be explored in the next chapter. The next chapter will be covering theories of partisan politics, political stances when it comes to environmental issues, as well as the rationale of my decision when choosing party ideologies as the mediator variable.

## **2.3 Partisan politics in the opinion-policy nexus**

### **2.3.1 Partisan politics: overview and discourses**

Hibbs is widely recognized by scholars of partisan politics as the founding father of the so-called Partisan Theory. In many of his influential works (Hibbs 1975, 1977 and 1992), Hibbs established evidence for the hypothesis that the government's political orientation plays a significant role in shaping macroeconomic policies. In addition, Hibbs' Partisan Theory also stresses the electoral motivations of parties behind the policy-making process: parties usually prefer policies that are in compliance with preferences of their "core constituencies". In particular, left-wing parties are associated with low and middle classes, favouring low unemployment rate over high inflation. In the interpretation of Korpi (1983), trade unions and

left parties aim to protect interests of the working class from being too dependent on the employers (cited in Loftis and Mortensen 2017: 890). In contrast, right-wing parties' constituencies consist mainly of high earners and thus a government controlled by a right-wing majority would accept a high unemployment rate in exchange for a low inflation. Partisan theory of Hibbs and many other scholars of the time (Nordhaus 1975; Schmidt 1982; Castles 1982; Chappell and Keech 1986a, 1986b; Alesina 1987; Alesina and Rosenthal 1995), considered as the classical school, however, solely concentrates on the sphere of macroeconomics, which cannot fully address the matters given in this research. Therefore, one needs to look beyond the scope of economics and reach out to studies that touch upon welfare state issues and social policy (Huber, Ragin and Stephens 1993; Iversen 2001; Allan and Scruggs 2004; Schmitt 2016; Loftis and Mortensen 2017, Hicks and Swank 1992). In general, they tend to agree that there are certainly differences in terms of social policies between left- and right-wing led governments. For instance, Tufte's (1978) work showed that in the realm of social policy, left-wing parties are in general more supportive of redistributive policies than their counterparts, hence a potentially more equal society. The inevitable trade-offs are high taxes and contributions, as well as a huge burden on the government budget.

Overall, partisan theory scholars of the present day can be categorized into four groups (Loftis and Mortensen 2017): (1) those who hold on to a well-established relationship of partisan politics and policies affirmative, or "parties matter"; (2) those who refute the partisan hypothesis; (3) those who think partisan effects are gradually decreasing; and lastly (4) those who think such effects are contingent on a variety of "contextual factors", including "globalization, union strength, type of social spending or institutional setup" (ibid: 891).

One of the predominant studies on the "parties matter" strand (group 1) is that of Schmidt (1996). In his work, Schmidt outlined eight key propositions<sup>2</sup> in order to explain the dynamics of how party ideology relates to public policy outputs. Through these propositions, he wanted to attract more attention towards the idea that "differences in the party composition of the government are causally related to differences in public policy" (Schmidt 1996: 156). In the end, the hypothesis is confirmed that at least within the advanced democracies circle, changes in the party composition result in changes in public policy. Depending on the types of democratic systems such as majoritarian and "sovereign" democracies (i.e. France, Sweden, the UK, the Netherlands and New Zealand) or moderate and "semi-sovereign" democracies

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<sup>2</sup> For further details, see Schmidt (1996), p. 156

(i.e. the US, Germany and Switzerland), the extent of partisan effects accordingly varies. To strengthen the role of parties in the policy-making process, Allan and Scruggs (2004) conducted an analysis proving that partisanship still substantially matters despite the era of welfare retrenchment. Schmidt (2015) provided a firm evidence for the stable and significant effects of partisanship by approaching a more peculiar method. In particular, she observed the effects in “cabinets” as a measure unit (Schmidt 2016: 1444), instead of using annual data.

The second group inclines to the convergence of party orientations represented by research of Kittel and Winner (2005), and Jensen (2011). In the study of Kittel and Winner (2005), partisanship is proved to exert no effect on the government expenditure; instead, it is influenced by other economic factors such as economic growth or unemployment. On the other hand, it is commonly believed that the convergence of welfare states is likely impossible due to the differences of party ideologies on social issues (Korpi 1983; Stephens 1979). Jensen (2011) challenged this common belief by testing whether the generosity of welfare states will tend to converge or diverge in the context of the growing globalization. In other words, the labour force might face with risks of job loss due to globalization because low-skilled labour might lose their jobs to cheap labour in developing countries, requiring more welfare programs to protect this group. The final result shows empirical evidence that the “traditionally closed economies” are running faster to catch up with the international standard, but have higher “risk exposure of workforce”, compared to the “traditionally open economies” (Jensen 2011: 106-107). This finding, however, cannot deliberately denounce the fact that there is a great variance of social policies among welfare states, according to the author.

Due to the economic crisis in the 1970s, austerity measures were implemented, leading to the era of welfare state retrenchment (Ebbinghaus 2015). As such, there are a strand of research (Ross 2000; Huber and Stephens 2001, 2014) that focuses on the decrease of partisan effects on social policy. Although Ross (2000) corroborates the idea “parties do matter”, she argues that differences of party ideologies are gradually diminishing. The example that leftist parties sometimes root non-leftist policies are mentioned to foster her argument (Ross 2000: 156). Upon examining the partisan effects on welfare issues such as social policy and distributive outcomes and especially concentrating on Christian democratic governmental parties, Huber and Stephens (2014) also discovered the incremental decline of partisanship in the stage when welfare states became less generous than before.

The outcome of Schmidt's (1996) study is partly in line with what group 4 characterises, since the varying levels of effects proven result from different "institutional setups" (Loftis and Mortensen 2017: 891). In addition, Busemeyer (2009) confirmed the influence of party differences on the outcome of policy-making process, especially the education policy. The increase of education budget reveals the impact of left-wing parties. Together with partisanship, economic globalization is a substantial factor having a partial impact on the education spending (Busemeyer 2009: 121). The author emphasised on the important role of partisanship in policy outputs, yet he suggested that future research be able to answer on which concrete dimensions parties matter and the rationale behind the selective impact.

As can be seen, each of the four groups has concrete evidence to support their arguments and leaning toward any of them at this stage would be detrimental to the integrity of this research. I would like to remain neutral and be open to all possibilities, even those outside of the aforementioned. For example, in another context, given the right data, one could also control for effects of factions (intra-party groups) or inter-party groups and hold them responsible for the diminishing role of partisan politics. In the scope of this research, however, my theoretical and statistical models can only reveal whether, to what extent, and under which conditions parties still matter for public policy.

### **2.3.2 Partisan differences in the environmental area and the establishment of Green parties**

I should remind readers of the fact that partisan effects might largely depend on the issues under investigation. Therefore, I reckon it is important to discuss environment protection and its political salience in recent decades. As a matter of fact, environmental issues belong to the group of new political issues, also called "new politics", which are part of the post-materialism transformation mentioned in the previous chapter. The emergence of new politics has led to the structural change of political cleavages. A new polarisation has therefore been formed, specifically between materialists – who solely concentrate on economic goals and values – and post-materialists – who prioritize non-economic factors such as environmental protection. The partial importance of this cleavage has become much more prominent in Western industrial societies, yet it has not outplayed the traditional structural cleavages in party competition (Knutsen 1988). This subchapter will discuss whether environmental issues should be considered as a salient issue that divides political parties in elections, as well as why party positions on environmental issues is one of the central points of this study.

### ***Partisanship or non-partisanship in the environment domain***

Political orientations should never be treated as uni-dimensional, especially with the emergence of “new” political issues such as gender inequality or environmental movements. For instance, while parties are well-established on traditional issues such as economic freedom or immigration, environmental issues are often controversial and thus spark debates even within parties, the public, and the scientific community. As “old politics” cleavages do not provide any useful clue in this situation, incumbent parties usually find it difficult to forecast public attitudes in this domain, which are tightly related to voting behaviours (Müller-Rommer 1985). As such, providing a complete picture of partisan differences regarding environment protection will shed light on whether it is reasonable to include partisan politics in the theoretical model.

So far, existing research works (Tranter 2011; Dunlap, Xiao and McRight 2001) seem to suggest that environmentalists are mostly leftist supporters although the contrary might not always be accurate. The US is a good case study to verify this statement, as its political system is mainly dominated by only two parties: the Republican (right-wing) and the Democratic party (left-wing). Research studying partisan differences in environment protection measures in the years between 1960s and 1970s in the US showed that “the two parties do offer – have offered for some time – rather meaningful alternatives on environmental issues” (Dunlap and Allen 1976: 396-397) yet “...much of the nation’s landmark environmental legislation was passed during the Republican Nixon and Ford administration with considerable bipartisan support” (Dunlap, Xiao and McRight 2001: 23). Still, it is believed that the Democratic party would have a higher chance of adopting more “pro-environment” legislation than its counterpart (ibid). Since the 1970s, the environmental cleavage between the two parties diverged even more drastically when the Republican party took a more opposing stance toward new environmental measures (Dunlap and Allen 1976; Dunlap, Xiao and McRight 2001). Similarly, the environmental issue is politicized and has been proven to be influenced by partisanship in Australia, where constituencies of Labour and Green parties strongly root for stricter environmental protection laws (Tranter 2011).

Partisanship on environmental issues in Europe is yet a different story. Perceiving the environment as an internationalised area, Knill, Debus and Heichel (2010) showed how political ideology could partly shape environmental policy outputs, apart from international integration, economic development, and domestic pressures. This research gathered data from



18 OECD (mainly European) countries in the period between 1970 and 2000. An important argument of the scholars is that the environment domain, unlike other policy areas such as macroeconomics or fiscal and tax policy, cannot be simply reflected on the normal left-right scale, especially in multi-party systems that are common in Europe. Let us take Germany as an example. While the CDU is generally considered as a center-right party on multiple issues, it actually supports environment protection because doing so serves the purpose of “saving God’s creation” (Knill, Debus, and Heichel 2010: 304). Meanwhile, economic growth as well as securing jobs are seemingly more important to the social democratic party (SPD) than environment measures. Another example can be seen in the work of Rohrschneider and Miles (2015). Economically conservative elites actually acknowledged environmental problems while economically leftists expressed their doubts about the severity of environmental degradation (Rohrschneider and Miles 2015: 620). In addition to depicting the contrasting picture, Rohrschneider and Miles also emphasized the increasing political salience of environmental issues and stated that they have become central to party competition as mainstream parties show clear preferences on both economic and environmental domains. Finally, they demonstrated how environmental concerns of parties are not evenly distributed across Europe, as in economic development is still the ultimate goal in Central and Eastern European countries – “the newer democracies”.

In short, studies have hitherto demonstrated three major tendencies of partisanship in the environment domain. In countries like the US where political orientations are prone to polarization, environmental issues are more unique to left-wing than right-wing parties. On the other hand, in multiparty systems with coalition governments like Germany, environmental issues are not specific to any extreme but are rather contextual. Lastly, there are cases where environment protection is not yet a salient issue as there are more urgent and important goals.

In spite of the expected cross-national and cross-institutional differences, I suspect that there will come a shared pattern of ideological convergence on environmental issues. Take the United Kingdom in the period between 2006 and 2010 as an example. After David Cameron got into office in 2005, he included environmental issues in the political agenda and was credited as the “catalyst” who pushed the two mainstream parties at the time (Conservative and Liberal Democrats) to acknowledge the seriousness of environmental issues and took noticeable measures to develop a greener economy. This is despite the fact that environment protection has never been a focus of the Conservatives (Carter 2014). This cross-party support backed by the Conservative-Liberal Democrat Coalition remained positive until climate change

was turned into “an increasingly partisan issue”. Nevertheless, the case of the UK signals a possible convergence of party orientations regarding environmentalism. Therefore, although there might still exist cleavages between political parties, the fact that all human beings would ultimately suffer from consequences of environmental degradation such as air pollution, global warming or climate change is quite obvious. Furthermore, due to the rise of Green parties around Europe, structural changes within parties from both sides are inevitable. In the next section, I will discuss why the surfacing of Green parties is highly interesting for environmentalists and political scientists alike.

### ***Green parties and the greening of established parties***

Besides the fact that some mainstream parties are becoming greener, the establishment of Green parties have also played a role in putting environmental issues in the spotlight. At the beginning, due to the increasing significance of postmaterialist values (Inglehart 1977) including environmentalism, many social groups emerged and organized protests to raise their voices. They initially objected to urban renovation and nuclear power and attempted to have influence on “the NATO dual-track decision on intermediate nuclear forces as well as the stationing of Cruise missiles in Western Europe” (Müller-Rommel 2002: 1). The first Green parties in Western Europe were hence founded. According to Carter (2007):

“...The first green parties were formed in Tasmania and New Zealand in 1972, and the Swiss elected the first green to a national assembly in 1979. By the late 1990s, green parties were sufficiently established to have joined national coalition governments in Belgium, Finland, France, Germany and Italy, to have deputies in several other national parliaments, and to be represented in sub-national chambers in many countries. In 2004, thirty-four Green MEPs from eleven countries were elected to the European Parliament...” (Carter 2007: 88)

In other words, the emergence of Green parties imposed a challenge to the paradigm of economic growth as well as nuclear power development because the environment can no longer be neglected. The participation of Green parties in national parliaments has not only increased the opportunity for more environmental measures to be adopted, but also encouraged the greening process of other mainstream parties. Theoretically, Green parties are distinct from mainstream parties due to its anti-party perspective, according to Carter (2001). This perspective initiates from the founders of Die Grünen in Germany emphasising two objectives: respect of “grassroots democratic principles” such collective leadership, income equivalent to that of skilled labour, etc. and refusal of forming party coalitions to keep the party from being

institutionalised and systematically established (Carter 2001: 108). Nevertheless, the commitment of the two objectives was indeed challenged for electoral purposes and Die Grünen faced a dilemma (ibid: 111-113). In particular, the party's defence of radical strategies to challenge the well-established parties would satisfy its core constituencies but have lower chance of gaining more public support, whereas although the party had to compromise with other parties to make gradual change, the chance of being elected would be maximised. This dilemma then caused the internal strife within the party between Fundamentalists (support radical strategies) and Realists (support moderate strategy). As a result, the term "anti-party" was abandoned through two incidents that Realists helped the party to win seats in the parliament as well as formed the coalition with Bündnis '90 in the 1993 general election. Regardless of failing to be consistent with the two core objectives, this is an example showing the process of Green parties managing to participate in the government.

The political position of Green parties, however, remains still controversial among scholars due to its single-issued nature. Some believe that Green parties should be labelled as "New Left" or "left-libertarian" parties (Kitschelt 1988), while others such as Dalton (2008) suggested there be a new dimension, which is orthogonal to the traditional left-right dimension, so that Green parties could have their own position (Cater 2013: 74). Carter (2013) also pointed out the "unusual homogeneity" of Green parties which is "characterised by strong environmental, libertarian and left-wing policy positions", since in addition to environment, Green parties share quite similar perspectives with left-wing parties on certain matters such as economic issues, immigration, women's rights and lifestyle choices. That said, as Carter noted, it is not uncommon for Green parties to affiliate with parties from the right side of the spectrum, as long as it serves their main purpose: pushing the environment agenda.

In fact, environmental issues are no longer exclusive to Green parties: mainstream parties which recognize the significance of the environment are also a part of the greening term. In countries where no Green party exists, left-wing or libertarian parties often take charge in addressing environmental problems. This explains why left-wing parties in Carter's (2013) models tend to be more pro-environment than right-wing parties, but only on non-salient issues. Another evidence can be found in an earlier work (see Carter 2001, part II, chapter 5), in which the researcher observed how established parties in Germany, Britain and the US adapted to new political issues, environmental included. The most noticeable difference between the three countries is that the green party in Germany (Die Grünen) was able to influence other mainstream parties in the coalition, while the role of Green parties in the US and Great Britain

was regarded as irrelevant. As such, in these two countries, the greening process depended largely on mainstream parties. Generally speaking, although established parties have indeed become greener as a reaction to the rising public concerns on environmental issues, adopted policies are unfortunately marginal. The reason is that economic development is still central to those parties, thus imposing too strict environmental policies could do more harm than good to their competitiveness.

One thing interesting that Carter (2013) has demonstrated is that although Green parties still belong to the left wing, a small group of Green parties are relatively centrist on the left-right dimension while their economic and social policies are characterised as libertarian. To sum up, it is obvious at this stage that parties differ considerably in terms of their preferences toward environmental issues. While Green parties have become much more relevant in European politics, the greening of mainstream parties are also of great importance for the success of the environmental movement. What remains unclear is how parties with dissimilar attitudes work out their differences in negotiations, especially in consensus democracies where no party has enough mandate to single-handedly control the whole policy-making process. This is something that has not been tackled hard enough in the literature, partly because the favourite case study of partisan politics scholars so far is still the United States with a two-party system. One of my contributions, thus, an enhanced focus on consensus systems where parties, even mainstream ones, do not always play the decisive role in shaping policies.

### **2.3.3 Public opinion influences party positions towards environment**

From the two previous subchapters, it can at least be assumed that parties and their ideologies, although at times contextually, might have an effect on public policy. The question is whether such ideologies come directly and wholly from within the parties themselves or whether external factors have a role to play as well. In a healthy democracy, parties are known as representatives of the general public. Therefore, it is not irrational to assume that there is at least a link between the public's preferences and parties'. In fact, research has shown that party ideologies would adjust in accordance with the shift of public opinion (Adam et al. 2004; Adam, Haupt and Stoll 2009). This observation of Adam and his colleagues is based on the research question of whether changes of party stances are responsive to shifts of public opinion or to past election results. Three distinct hypotheses were made, including H1: the General Dynamic Representation Hypothesis, H2: the Dynamics of Disadvantaged Parties Hypothesis and H3: the Past Election Results Hypothesis. As their names suggest, H1 implies a one-way causal model of public opinion and party stances, H2 points toward the responsiveness of

parties on public opinion only when the supporters tend to change their ideology, while H3 is a path-dependent model where ideological changes are dependent on past results. Using data from the Comparative Manifesto Dataset (CMP) and the Eurobarometer Special Surveys (ESS) in the period between 1976 - 1998, the scholars accepted H2 and rejected both H1 and H3. This means parties would consider re-positioning its policy stances only when the public tends to “clearly shift away from the party” (Adam et al. 2004: 593). Apart from the fact that these data are a bit out of context (outdated), another limitation that the authors themselves admitted was that they could not reach the generalization of the hypothesis due to the small number of observed countries (only eight Western European countries). Moreover, the complex natures of different political systems and institutions might render the generalization task even more daunting. In a more recent and extensive work, O’Grady and Abou-Chadi (2019) found little to no responsiveness of parties to public opinion shifts in 26 EU countries. Upon discussing responsiveness, the authors noted that responsiveness has “occurred when parties shift their positions in the same direction as voters’ ideological shifts” (O’Grady and Abou-Chadi 2019: 2). A remarkable point of this study is that the two authors did not take the left-right dimension for granted in all domains, but they decided to observe ideological positions in four separate policy areas including economic issues, expectation to government spending, social issues and immigration issues. By proving the absence of responsiveness yet still accepting the righteousness of the theory, O’Grady and Abou-Chadi criticized the limited availability of data sources to measure party positions as well as the major dependence of scholars on the CMP. In addition to the criticism, the selection of policy dimensions and the utilization of only short-term data are regarded as possible reasons for the non-responsiveness.

The above-mentioned findings would be a good starting point for further research on the relationship between public opinion and party ideologies which focus on a concrete area such as environmental issues. Research (Neumayer 2004; Costantini and Hanf 1972; Dunlap, Xiao and McRight 2001; McCright, Dunlap and Marquatt-Pyatt 2016; Knight 2016) found that preferences of environmental measures are also driven by ideologies as liberals in the general public are likely to take environmental threats more seriously than conservatives. The research area of partisan differences on environmentalism in general public has become more diverse thanks to research on the national level studying the political divides within the public on a specific environmental issue, namely climate change, in many countries such as the US, Canada, Australia, the UK and others (McRight, Dunlap and Marquatt-Pyatt 2015: 339). Since the US seemed to be a common case study for research regarding party stances on the

environment at both local and national level and there was a lack of research in the comparative fashion, Nawrotzki (2012) attempted to generalize the hypothesis by conducting a cross-national empirical analysis with data from the International Social Survey Program (ISSP). The result, not surprisingly, demonstrated the similar liberals - conservatives cleavage as in prior research. However, because the research also employed data for less developed countries, there was a contradictory tendency where conservatives strongly opposed environmental measures in wealthy nations, whereas conservatives in less developed countries appeared more pro-environmental than liberals.

Although several scholars have expressed their interest in political ideology on environmental issues, there has not been much research, to the best of my knowledge, asking explicitly the question whether or not parties would change their policy stances as a response to the shift of public opinion towards this very matter. As mentioned, the study of Adam and his colleagues (Adam et al. 2004) approved the hypothesis that parties would make changes when foreseeing the possibility of their supporters to shift away. On the other hand, Dunlap, Xiao and McRight (2001) were quite confused because of the incongruence between parties and the public. These works, however, neglected the multidimensionality of both public preferences and party positions. It is obvious one cannot simply use a generic left-right score for all domains. Therefore, cross-national studies that choose only questions relating to environmentalism would be essential to fill the void left in this research area.

Regarding public attitudes and their determinants, many scholars (Bloom 1995; Franzen and Vogl 2013; Marquart-Pyatt 2012; Hadler and Wohlkönig 2012; Hamilton, Colocousis and Duncan 2010; Neumayer 2004) have strived to anticipate the environmental attitudes of the public, on either country-level or cross-national level using different predictors. These works can be categorized in three specific groups based on the choice of predictors: the level of development (developed versus developing), the former regime (post-socialist/capitalist) and political ideology. First, regarding development, general awareness on the quality of the environment is greater in developed countries (Bloom 1995; Franzen and Vogl 2013) than developing ones. Second, former socialist countries, more particularly Central and Eastern European ones, publicly displayed less concern on this matter despite the advancement of the economy in past decades (Marquart-Pyatt 2012; Hadler and Wohlkönig 2012). Finally, environmentalists were found to be more likely to support left parties (Hamilton, Colocousis and Duncan 2010; Neumayer 2004; McCright, Dunlap and Marquart-Pyatt 2016; Tranter 2011). This last trend, nevertheless, was only applicable to wealthy and developed countries,

not to less developed countries where “conservatives are more environmentally concerned than liberals” (Nawrotzki 2012). Knowing the constituencies of parties, exploring public attitudes and how they affect party positions on the same matter is therefore highly intriguing. Since environmental problems are considered as a special issue which the traditional political ideology has difficulty allocating on the left-right spectrum, they deserve more spotlights.

The discussion thus far has prompted me to put forward a theoretical model in which party positions mediate the effects of public opinion on environmental policy. The next and also final subchapter of the literature review will be dedicated to clarifying this.

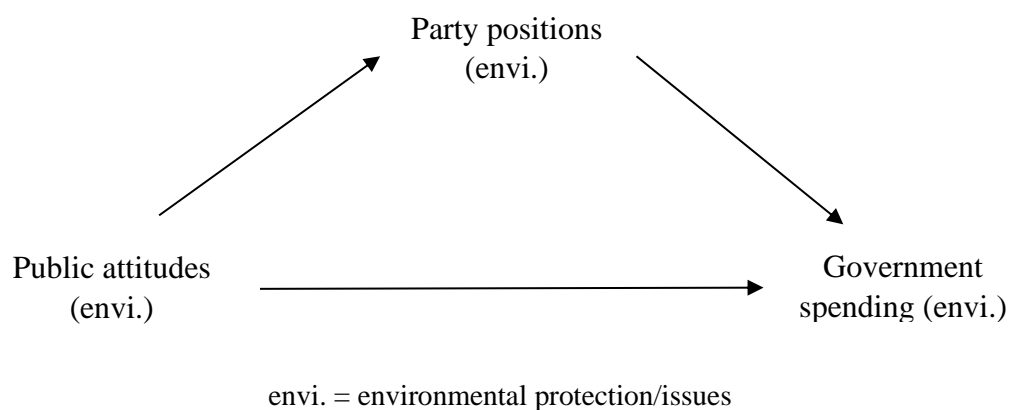
## 2.4 The theoretical model

Based on the three groups of theories and literatures (opinion-policy link, opinion-party positions link, and party positions-policy link) in the previous chapter, I hypothesize a theoretical model displaying the relationship between three elements with a focus on environmental protection (Figure 1). Accordingly, I postulate three hypotheses to be evaluated:

H1: There is a direct effect between public attitudes and environmental policy.

H2: There is an impact of public attitudes on party positions on environmental issues.

H3: There is an indirect effect between public attitudes and environmental policy, which is fully or partially mediated by party positions.



**Figure 1: Theoretical model. Drawn by the author.**

The outcomes of this research are supposed to more particularly construe the role of partisan politics in the opinion-policy linkage (Dunlap 1975; Rudolph and Evans 2005; Tranter 2011; McCright, Dunlap and Marquatt-Pyatt 2016) in terms of environmental protection.

Although many past works have already touched upon the political aspect, most of them tend to underestimate the power of political ideologies and treat them as more or less a customary control variable. In fact, as Schmitt (2015) has pointed out, the oversimplification of partisan effects can exert a huge impact on the results a researcher gets.

### 3. Data and method

#### 3.1 Structural equation modelling

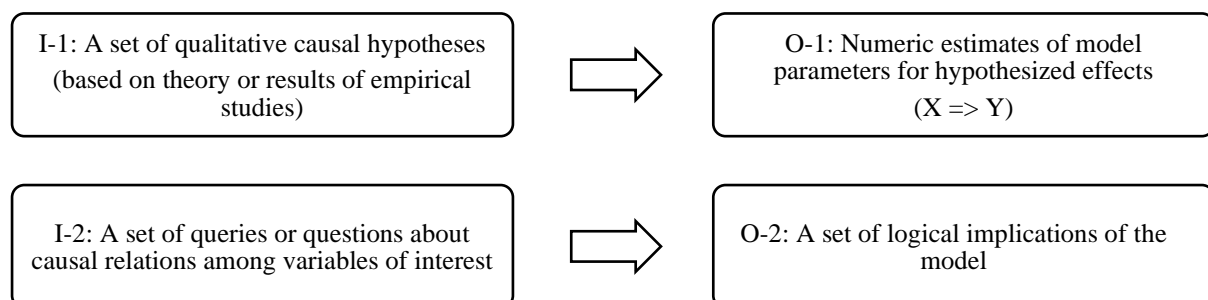
##### 3.1.1 General description of structural equation modelling

###### *Definition and superior characteristics*

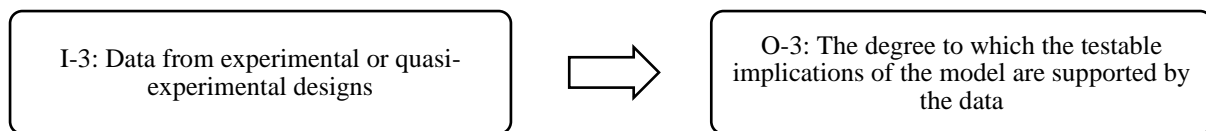
In order to process the empirical analysis for the conceptual models in the last chapter, I believe that the statistical method called Structural Equation Modelling (SEM) would be the most appropriate. To demystify and understand this method, I will make use of two books as guidelines. The first book is “*Principles and Practice of Structural Equation Modelling*” by Rex B. Kline (2016) and the second is “*A beginner’s guide to Structural Equation Modelling*” by Randall E. Schumacher and Richard G. Lomax (2016). Not only do these two books provide an impressively detailed explanation of SEM such as definition and analysis procedures, they also incorporate useful examples to demonstrate how to properly construct and analyse a model.

First of all, it is crucial to explain what exactly SEM is. Kline (2016) uses the definition of SEM given by Pearl (2012) to clarify the term structural equation modelling. In simple terms, it is a combination of factor analysis and multivariate regression. According to Kline, SEM should be perceived as “a causal inference method that takes three inputs (I) and three outputs (O)”, as shown in the figure below (Kline 2016: 9-10).

**Figure 2: Generalization of SEM method**







*Source:* Kline (2016: 9-10). Drawn by the author.

As for my research, the theoretical models have been developed based on three groups of theories which are public opinion-policy theory, public opinion-partisanship theory, and partisanship-policy theory. Kline stresses in his book that the role of theory is really important in SEM because it is an effective tool used in examining the model built on theories. Another superior characteristic of SEM is that it can analyse complex models with multiple variables and figure out both direct and indirect relationships between variables in a single model, while the traditional regression analysis can only confirm direct effects (ibid: 9). This is the most helpful function for the purpose of this research because I am attempting to elucidate the relationships between public opinion (regarded as latent construct), party positions and government spending on environmental protection. It means that the hypothetical model of my research has the possibility of containing both direct and indirect effects between variables. Moreover, an advantage of using SEM, according to Kline, is its ability to analyse both observed and latent variables, while other common statistical methods such as the analysis of variance (ANOVA) and multiple regression can only deal with observed variables. In brief, SEM is regarded as a path analysis with latent variables.

### ***Insignificance of significance testing in SEM***

Despite the superiorities of SEM mentioned above, significance testing is, however, not one of its central functions. In other words, unlike ANOVA or multiple regression, SEM does not zero in on significance testing for four reasons (Kline 2016: 17). The first reason is that SEM focuses on evaluating entire models, not only on some individual effects represented in the model. That accounts for the claim that SEM shows “a higher-level perspective to the analysis”. Second, as significance tests do not function well with small-sized samples in SEM, leading to the lack of precision in analysing certain results, one of the criteria of SEM is large samples. Nonetheless, there are as well certainties by using significance testing because the effect is not dependent on significant results, which means even though results are proved to be significant, effects could still be there. Another reason is due to the possible difference of p values for effects of latent variables when being computed in different programs. The last reason, which is more of a call

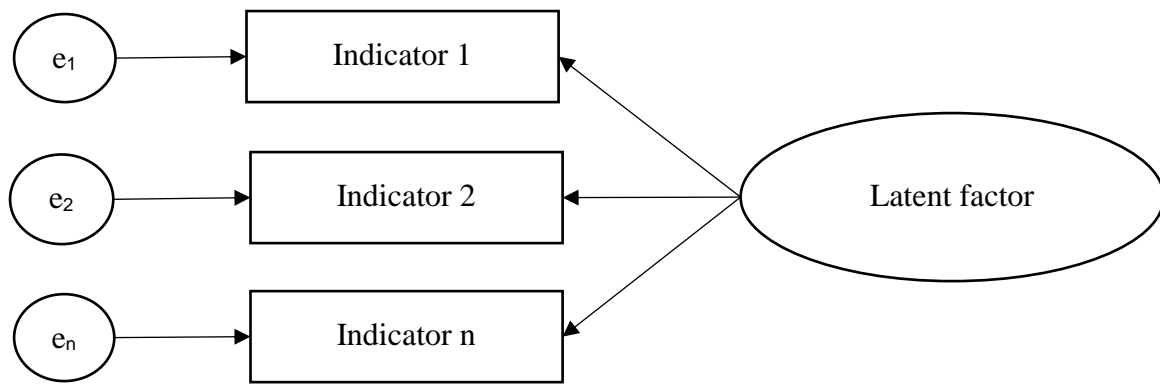
for revolution, is that researchers should pay more attention to “estimating effect sizes and their precision than with the outcomes of significance tests” (ibid.).

### **3.1.2 Observed and latent variables**

Since latent variables cannot be directly observed, a possible way to measure them is to examine observed variables, also called as indicators or manifest variables, which are able to represent those latent constructs. Kline (2016) defines and categorizes these two types of variables as:

“Observed variables represent your data - that is, variables for which you have collected scores and entered in a data file. These variables can be categorical or continuous, but all latent variables in SEM are continuous. There are other statistical methods for analysing categorical latent variables, but SEM deals with continuous latent variables only.” - (Kline 2016: 12)

Kline highlights the capability of SEM in dealing with latent variables which are continuous. Additionally, another superior characteristic of SEM is that SEM also considers residuals or error terms which are related to observed or latent variables functioned as dependent variables, whereas the common linear regression models usually implement the measurement without considering errors. Nevertheless, as latent variables are considered as hypothetical constructs that need theories or literatures to explain the selection of their indicators, there are more than one step to test and determine the accuracy and reliability between latent factors and their indicators (observed variables) prior to examining the whole hypothetical model. That is the main purpose of the measurement model in which CFA plays an important role. Thus, CFA will be one of the focal themes in the following part. The general depiction of latent variables is performed in Figure 3. In the figure below, each indicator can be thought of as a dependent variable, or endogenous variable in the language of SEM, which is simultaneously affected by two independent variables: the latent construct and the residuals. Thus, the picture below is actually a set of three linear equations.



e: Residuals/errors of indicators

**Figure 3: Latent factor and its indicators in a path model.** Drawn by the author.

### 3.1.3 SEM analysis procedures

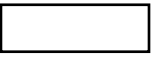

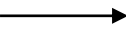

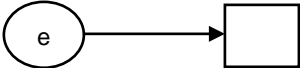
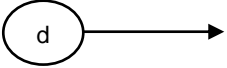
According to Kline (2016), there are generally six basic steps in most SEM analyses, comprised of:

1. Model specification.
2. Model identification
3. Selection of measures and data.
4. Model estimation.
5. Re-specification or modification of the model if the model fit is poor.
6. Report the results. - (Kline 2016: 118)

#### *First step*

The first step starts with the **model specification**. This step requires the literature review of the selection of observed variables as indicators of latent variables as well as the theory that forms the structural model, since the whole model is built on theory (Schumacker and Lomax 2016: 108). On the other hand, dependent and independent variables should also be specified (Kline 2016: 119). Dependent variables in SEM are also known as endogenous variables, while exogenous variables is another way to address independent variables. In an indirect effect with more than three variables, it is possible that a variable is simultaneously exogenous and endogenous, as it can be a cause of this variable but an outcome of another variable. The hypothesized model can also be specified using a path diagram (with symbols explained in Table 1) that represents relationships between variables.

**Table 3.1: Symbols of SEM**

	Observed variables and indicators
	Latent variables/ Factors
	Hypothesized directional effects, or direct effects
	Variances/covariances
	Measurement error of observed variables (indicators)
	Disturbances of endogenous variables

Source: Kline (2016). Drawn by the author.

### *Second step*

The next step is **model identification**. In this step, it is important to evaluate whether the theoretical model is able to be identified. It is worth noticing that data is not yet involved at this point, because the model will be identified by looking at the number of observations, not the sample size (N). Kline suggested that the identification of models should happen prior to the gatherings of data (Kline 2016: 149). Furthermore, if the model is not identified, it is necessary to respecify the model.

Two essential elements needed for the step of identification are the number of observations (p) and the number of model parameters (q). In terms of the former, or p, I would refer to a rule given by Kline that :“If v is the number of observed variables in the model, the number of observations equals  $v(v+1)/2$  when means are not analysed.” (ibid: 127), or:

$$p = v(v+1)/2$$

Noticeably, the number of observations changes only when variables are added or removed, not due to the adjustment of sample size. Meanwhile, the number of model parameters to be calculated can be assumed based on the theoretical model. More particularly, each direct effect, variance or covariance can represent a parameter. There are three types of parameters including free, fixed, and constrained parameters. Kline defines each parameter as: “A free parameter is to be estimated by the computer with the data; a fixed parameter is specified to equal a constant; and a constrained parameter is estimated by the computer with some restrictions, but it is not fixed to a constant” (ibid: 129).

In aggregate, in order that the theoretical model is identified, the *model degrees of freedom* ( $df_M$ ) is taken into account as it shows the differences between the number of observations and the number of parameters. The according formula is:

$$df_M = p - q$$

Due to one of the criteria for the model identification that “the model degrees of freedom must be at least zero ( $df_M \geq 0$ )” (ibid: 145), there are three possibilities of the model as follow:

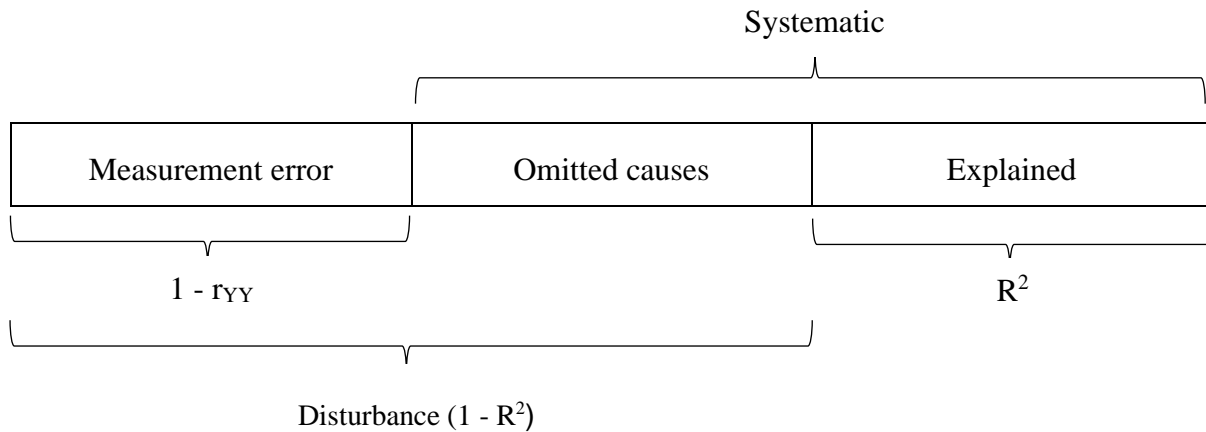
1. If  $df_M > 0$ , the model is overidentified. In this case, the number of observed variables exceeds the number of free parameters.
2. If  $df_M = 0$ , the model is just-identified. In other words, the number of observed variables equals the number of free parameters.
3. If  $df_M < 0$ , the model is under-identified. This is when the number of free parameters exceeds the number of observed variables.

Additionally, the model is considered as under-identified when some of the parameters cannot be estimated because of the lack of known information. To make an under-identified model become identified, it is commonly suggested either to remove or add observed variables to the model or to fix/constrain them, but the modification should always take place with the consideration of theories.

*Scaling disturbances* is also one of the requirements for model identification, as Kline stated that “every latent variable - including disturbances or error terms - must be assigned a scale” (Kline 2016: 145). To simplify, a disturbance stands for residual (unexplained) variation and adheres to every endogenous variable in path models. In structural models, disturbances are treated as latent exogenous variables or unmeasured exogenous variables and represent all omitted causes of the endogenous variable plus measurement error (ibid: 130). One should not misunderstand that disturbances in SEM are similar to residuals in multiple regression. The figure 4 will demonstrate how explained and unexplained variances (disturbances) constitute the total observed variance. In the explanation of Kline below, Y is the continuous endogenous variable.

“The proportion of explained variance is  $R^2$ , the squared multiple correlation between Y and all the observed variables specified to cause Y. The proportion of unexplained variance is  $1 - R^2$ , which can be decomposed into measurement error and systematic variance due to omitted causes. The measurement error is estimated by  $1 - r_{YY}$ , where  $r_{YY}$  is a reliability coefficient”. - (Kline 2016: 131)

**Figure 4: Composition of the total observed variance**



*Source:* Kline (2016: 131). Re-drawn by the author

Regarding scaling disturbances, they “are usually scaled by imposing a unit loading identification (ULI) constraint” (ibid: 148). It means that disturbances are regularly constrained to 1.0, which is the numeral “1” seen next to the path from disturbances to endogenous variables.

In general, there are two major principles: (1) the model degrees of freedom equal or higher than zero, and (2) the scaling of disturbances are the requirements for the identification of a recursive path model. Recursive models contain only single-directional and straightforward causal effects. The criteria for non-recursive models demonstrating feedback or reciprocal effects are more complex than identifying recursive models. Instrumental variables, order condition and rank condition are the requirements that should be taken into consideration when identifying non-recursive models. Nevertheless, I would concentrate on recursive models based on the theoretical model proposed in this research.

The procedures of model identification are also comprised of **the identification of the measurement model and the structural model**. A measurement model, which is a part of the structural model, contains only latent variables - factors (functioned as exogenous variables) and observed variables caused by those latent variables, known as indicators. Theoretically, there are two methods of measurement model identification including exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The main point differentiating two techniques is that EFA deals with unrestricted measurement models where indicators measure all factors (regardless of single-factor or multi-factor models), while CFA is used for restricted ones where indicators are dependent only on their own factors. However, since EFA is not

considered as a part of the SEM family (Kline 2016: 188), this research would only make use of CFA technique. Similar to structural models, the identification of CFA models depends on the two general requirements that involve the model degrees of freedom (equal or higher than zero) and the scaling of latent variables including errors by imposing the ULI constraints (ibid: 198). All indicators are also required to be continuous. In general, there are two types of CFA models which are standard and nonstandard models and the identification requirements are hence different in accordance with each type of models. As for standard CFA models, the minimum number of indicators required are three for a single-factor model, or at least two indicators for a multi-factor model (it means each factor has two or more indicators), so that the model can be identified (ibid: 201-202). Identification rules for nonstandard CFA models are more complicated than for standard models because the correlation between errors of indicators has to be noticed. Specifically, one should consider the minimum mandatory number of indicators whose errors should be uncorrelated. This criterion is applied to every factor, every pair of factors and every indicator (Kline 2016: 203). If those criteria are satisfied, the nonstandard CFA model will be identified.

After measurement models (measure the correspondence between latent variables and their indicators) are identified, the **identification of structural models** is the second most important part. Kline claims that structural regression (SR) models are “the most general kind of model in SEM” (ibid: 212); therefore, the structural part of a SR model will be understood as the part containing direct and indirect effects among latent and observed variables. In order to identify a SR model, the type of the model should be clarified. Specifically, there are two kinds of SR models: fully latent SR models and partially latent SR models. The former represents their structural part with latent variables measured by multiple indicators. Which latent variables having only one indicator (single indicator) is determined to be a characteristic of partially latent SR models. The general rules for identification given by Kline, a so-called *two-step identification rule*, as follows:

1. the measurement part respecified as a CFA model is identified; and
2. the structural part is identified. - (ibid: 217)

Conditions for the first part of the rule have been spelled out in the step of measurement models' identification (CFA). Rules mentioned in the identification of path models will be applied to the second part. Nevertheless, the rules mentioned above are only applicable to a fully latent SR model, not a partially latent SR model with single indicators because the minimum number of indicators per factor are two, for a multi-factor CFA model. As such, the

solution is to fix the error variance of the single indicator to a constant, then the CFA model is identified. It is necessary to emphasize that when the measurement model is not identified, it is impossible to continue with the identification of the structural model.

However, the identification of the measurement and structural part is usually conducted using software specialised for SEM such as AMOS, EQS, LISREL, or R using SEM packages such as *lavaan*.

### ***Third step***

The third step is called **measure selection and data collection**. This step basically involves three key activities: selecting good measures, collecting the data, and screening the data.

### ***Fourth step***

**Model estimation** is the following step of SEM. Three main points of this stage are:

1. Model fit evaluation: to assess whether the model fits the data. When the model does not fit the data well, it is necessary to consider whether re-specification of the model is possible, and the modification must be based on theory.
2. Parameter estimates interpretation: if the model fits the data, then the parameter estimates would be interpreted.
3. Equivalent or near-equivalent models' consideration - (Kline 2016: 120).

The most common method used in the estimation of structural equation models is the maximum likelihood method (ML) used to estimate the unknown parameters. It is possible to deal with all types and range of structural equation models such as both recursive and non-recursive models, or models with substantive latent variables (ibid: 235) and “yield robust estimates of parameters” (Schumacker and Lomax 2016: 108). The associated standard errors are believed to be the most important facet when model parameters being estimated, as the “biased or inflected” standard error might cause problems on testing the statistical significance of a parameter (ibid: 108).

Testing the model fit is also a part of estimation step of SEM and model chi-square ( $\chi^2$ ) is the key concept in conducting the test because according to Schumacker and Lomax, chi-square is “considered the only statistical test of significance for testing the theoretical model” (ibid: 110). The range of chi-square values is from zero to their maximum values. This means



the closer to zero this value is, the more likely the data fits the theoretical model. That is the reason why the chi-square test is also known as a measure of badness-of-fit. When the value equals zero, the model will be saturated with all paths included, whereas the maximum value proves the independence model with no paths included. A non-significant chi-square implies that the sample covariance matrix is quite similar to the model-implied covariance matrix.  $\chi^2$  can be calculated using maximum likelihood (ML) method, with the following formula:  $\chi^2 = (n-1)FML$ , where F is the ML fit function. Apart from chi-square test with its degree of freedom and p value, the fit of models can also be assessed through other fit indices such as the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the root-mean-square error of approximation (RMSEA), and the root-mean-square residual index (RMR), to which, according to Schumacker and Lomax (2016), differences between the observed and model-implied variance-covariance matrices are the central point for calculating (ibid: 112). The estimation of the model is also divided into two parts: estimation of measurement models (CFA or latent variable models) and of structural models.

#### ***Fifth step***

When the model fit is poor, it is crucial that the model be respecified or in the work of Schumacker and Lomax, this step is called **model modification**. To modify the model, a path could be added or removed, as long as a plausible theory is provided. Nevertheless, the two authors claim that the model not fitting the data is not abnormal, as it can be implied, in that case, that the theory which the hypothesized model based is not adequately convincing or that the model analysis called for a better data sample (Schumacker and Lomax 2016: 109).

#### ***Sixth step***

The final step of the basic procedures of SEM is reporting the result. Kline (2016) emphasized that the analysis should be described “accurately” and “completely” (Kline 2016: 120-121).

Apart from these six steps, there are two additional steps: (7) Replicate the results and (8) Apply the results. They are, however, pretty out of the scope of this research, I will thus decide to take no notice of them.

### **3.1.4 Measurement invariance**

One crucial step that is not in the standard SEM procedure but should be performed in case of multigroup analyses is checking the measurement invariance of the latent variable. In

this thesis, the independent variable is an abstract, latent construct that cannot be directly observed but is approximated using variance – covariance matrices of three indicators at the individual level. This independent variable then enters mediation models with the mediator, the dependent variable, as well as other control variables at the country level. For such models to work, the latent construct has to be minimally equivalent across all studied groups, in this case: across countries.

There are many levels of invariance, but researchers usually do not go further than the first four, which are configural invariance, weak invariance, strong invariance, and strict invariance (Gana & Broc 2019). Configural invariance refers to the equivalence of structure, or the “general factorial pattern of the measure” (ibid: 160). Without putting any constraint on any elements of the factor (latent), this form of invariance only requires the same number of indicators and the same factorial structure of those indicators. Configural invariance can be thought of as the most basic, least restrictive kind of invariance, and if any latent construct does not meet these minimum requirements, it can only be used for each group separately. In contrast, if a CFA model passes the first test, researchers can continue to check if there is weak or metric invariance. Weak invariance is the invariance of factor loadings, or the “effects” of the latent variable each of the indicator (observed variable). Unlike regression models, factor loadings in factor analysis do not hold the same meaning and should not be interpreted as such. A factor loading of the latent on any indicator simply shows how much variance of the indicator can be explained by the factor. Therefore, a weak invariance indicates that the latent construct explains the same amount of variances of its indicators across all groups. The next level of invariance is known as strong invariance, which is the combination of both factor loadings invariance and intercepts invariance. In this mode, a constraint is placed on the means of all observed items given a random value of the latent variable. In other words, any one-unit change of the latent should correspond to a fixed amount of change in the intercept (mean) of all indicators in every group. Finally, strict invariance has all the quality above plus measurement error variance invariance. Measurement error variance is the “leftover” variance not explained by the factor. Accordingly, a strict invariance would constrain factor loadings, intercepts, and error variances of observed items in all groups to be equal. If fit statistics of this highly constrained model meet the standards, one can safely conclude that the latent construct is measurement invariant.

In non-experimental research, however, it is rare to see a latent construct that passes all four modes of invariance. Without the ability to control the experiment environment,

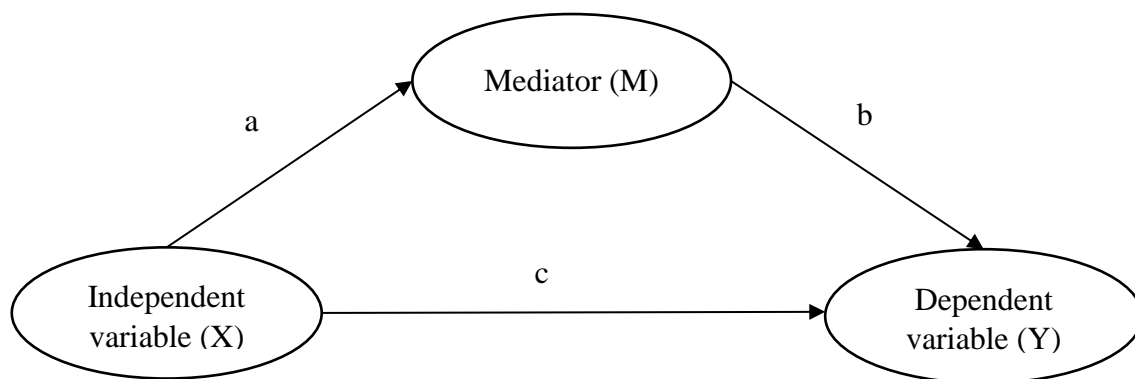
researchers cannot eliminate sources of biases that might systematically affect the measurement model. Depending on the kind of theory or hypothesis at hand, one should determine which stage of invariance to look for. In my study, I do not make any hypothesis, at least at the early stage, about the nature of the latent construct (equal loadings, intercepts, or error variances) but a basic pattern across countries so I can compare one country with another. Therefore, a configural invariance would suffice.

### **3.1.5 Mediation analysis in SEM**

#### **3.1.5.1 Classical mediation analysis by Baron and Kenny (1986)**

According to Baron and Kenny (1986), the significance of mediating variables, so-called mediators, were initially recognized by psychologists. In general, the concept of mediators is understood as an underlying factor that affects a relationship between two other factors. The two scholars draw a causal diagram in order to depict the dependent paths (a), (b), (c) among the independent variable, the mediator and the dependent variable (Figure 5).

**Figure 5: Mediation model by Baron and Kenny (1986)**



*Source: Baron and Kenny (1986) – Drawn by the author*

There are also certain conditions with which the mediator is able to function and the mediation model will be hence retained:

1. There is significant effect of the independent variable on the presumed mediator (path a),
2. There is significant effect of the mediator on the dependent variable (path b),
3. The mediator fully mediates the relation between the independent and dependent variables when path a and path b are controlled and the direct effect between two variables becomes insignificant. - (Baron and Kenny 1986: 1176)

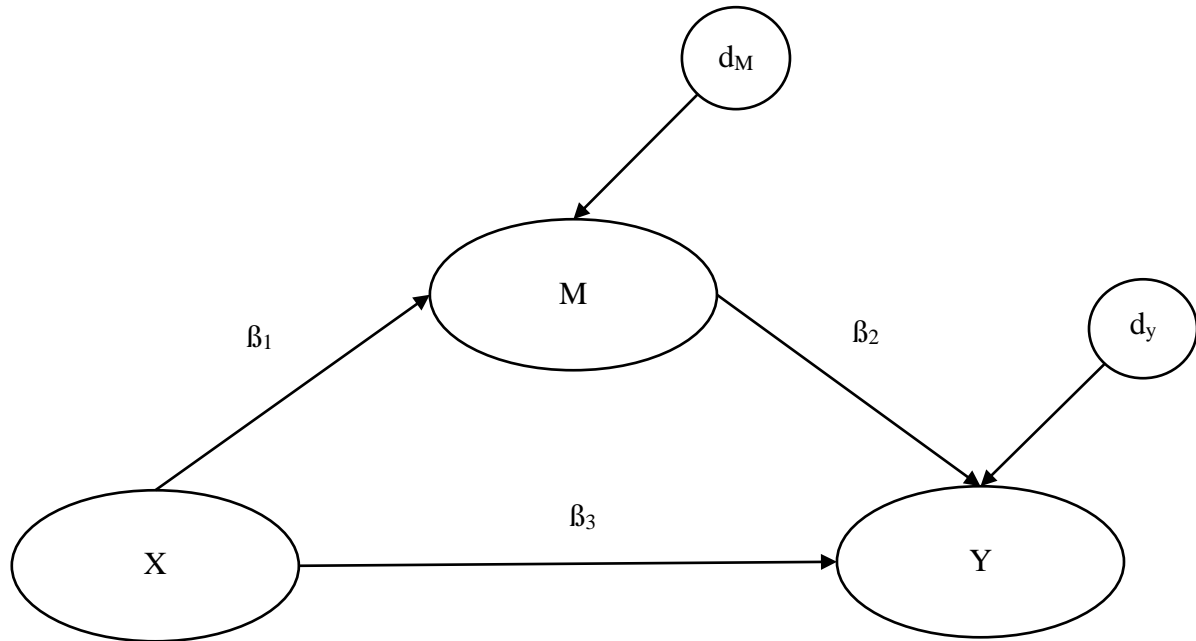
Due to the concept of mediation representing the effects between the independent variable, the mediator and the dependent variable, a test for mediation analysis should be conducted through three regression equations including (1) the regression of the dependent variable on the independent variable; (2) the regression of the mediator on the independent variable; and (3) the regression of the dependent on both the independent variable and the mediator. These regression equations will be simply estimated when all variables are able to be observed. One of the requirements for the estimation of mediational models by using multiple regression is no measurement error in the mediator (another condition is that the dependent variable should not affect the mediator) (ibid: 1177). However, estimating the model in compliance with the condition is likely impossible because variables are often measured with errors and the ignorance of measurement errors might lead to biased regression coefficients. Therefore, Muthén and Asparouhov (2015) suggest that the mediator should be treated as a latent variable with multiple indicators. Therefore, SEM is suggested to apply when dealing with mediational models with latent constructs, especially when it is the mediator. Baron and Kenny (1986) also mentioned the superiorities of this method such as its flexibility in analysing both nonexperimental and experimental data, all relevant paths being taken into consideration, and the direct inclusion of measurement errors' complications or correlation into the model (Baron and Kenny 1986: 1177). To strengthen the argument that SEM is better to work with latent-variable mediational models than the ordinary least square regression (OLS), Gunzler and his colleagues point out many advantages of SEM (see Gunzler et al. 2013: 391) and come to a conclusion that SEM is more suitable than the ordinary least squares method in dealing with “the causal relationships in a hypothesized mediation process, the simultaneous nature of direct and indirect effects, and the dual role of the mediator plays as both a cause for the outcome and an effect of the intervention” (ibid) in meditation models.

As a result, the next part will discuss further the causal mediation analysis in SEM, for instance, how a mediational model looks like in a path diagram as well as the equations with the application of SEM in analysing this kind of model.

### **3.1.5.2 Causal mediation analysis in SEM**

Similar to the classical mediational model, the model of causal mediation analysis in SEM is also comprised of three variables: the independent variable (exogenous variable), the mediator (can be both exogenous and endogenous variable), and the dependent variable

(endogenous variable). Figure 6 represents the path relations between three variables with their disturbances.



**Figure 6: Mediation path model in SEM.** Drawn by the author.

Three equations of the SEM for the mediation model are as follows:

$$Y = \alpha_0 + \beta_3'X + d_Y' \text{ (when M is controlled)}$$

$$Y = \alpha_1 + \beta_3X + \beta_2M + d_Y$$

$$M = \alpha_2 + \beta_1X + d_M$$

To clarify the above equations, X is the independent variable, M is the mediator and Y is the dependent variable and all X, M and Y have the possibility to be latent variables.  $\alpha_0$ ,  $\alpha_1$ , and  $\alpha_2$  are the intercepts.  $\beta_1$  is the coefficient when X affects M;  $\beta_2$  is the coefficient when M affects Y, and  $\beta_3$  is the coefficient when X affects Y in the same equation,  $\beta_3'$  is the coefficient when X affects Y without considering the mediator; and  $d_M$ ,  $d_Y$  and  $d_Y'$  are disturbances/error terms of M and Y respectively because M and Y are endogenous variables. In Figure 6, the effect of X on Y is considered as the direct effect ( $\beta_3'$ ) when the mediator is controlled. The effect of X on Y through M is the indirect effect ( $\beta_3*\beta_2$ ). The total effect is understood as the sum of direct and indirect effects, which is displayed in the path model as  $\beta_3 + \beta_1*\beta_2$  (Gunzler et al. 2013).

The assessment of the mediating process does not always give the same result. In other words, there are two types of mediation process which are full mediation and partial mediation. In the interpretation of Gunzler and his colleagues, a full mediation happens when the mediator (M) fully mediates the effect of the independent variable (X) on the dependent variable (Y). In this case, the direct effect is only recognised with the presence of the mediator; otherwise, the independent and dependent variables are not related. On the other hand, a partial mediation describes the effect that is partially mediated when the mediator is incorporated into the model. This means there is still a part of direct effect occurring between the independent and dependent variable without the inclusion of the mediator (Gunzler et al. 2013).

As stated by Kline (2016) that there will be no difference between the result analysis of causal mediation model using SEM method and of the classical mediational method by Baron and Kenny, unless variable X and M interact with each other (Kline 2016: 435). Since the hypothesized model contains latent constructs together with many advantages mentioned in section 3.1.4.1, the application of the SEM method into analysing the mediational model would be a better choice compared to the classical method.

### **3.2 Relevant variables**

#### **3.2.1 Independent variable: Public attitudes towards environmental issues**

As discussed in the theoretical part, public opinion, or henceforth public attitudes, is an ambiguous concept. Blumer (1948) found evidence for the abstract and latent nature of public attitudes, which cannot be directly observed. As such, one of the increasingly popular ways to operationalize public attitudes in recent literature, which has been done by Wlezien and Soroka (2012) or Breznau (2017, 2018), is to use sets of questions provided by the International Social Survey Program (ISSP). The ISSP has different modules covering a wide range of topics, with each surveyed repeatedly throughout the years in several countries. Regarding environmental issues, there are three modules of ISSP reporting data of public attitudes towards this matter, namely ISSP 1993 Environment I, ISSP 2000 Environment II and ISSP 2020 Environment III. Since the focus of this research is placed on European countries, countries which are outside the European territory will not be included. Moreover, the study is intentionally conducted in the cross-national comparative fashion; therefore, the number of participating countries is pretty important. While there were only 20 countries in the ISSP 1993, the ISSP 2000 and 2010 have expanded the number of participants to 38 and 36 countries, respectively. As a result, I

decide to employ the two most recent dataset, ISSP 2000 and ISSP 2010, with the participation of 17 European countries: Germany (DE), Great Britain (GB), Austria (AT), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Finland (FI), France (FR), Latvia (LV), Netherlands (NL), Norway (NO), Portugal (PT), Slovak Republic (SK), Slovenia (SI), Spain (ES), Sweden (SE), and Switzerland (CH). These countries are selected because they took part in the survey of both years.

Although ISSP provides data to measure the factor *public attitudes*, it is impossible to use all questions asked in the survey as the indicators of public attitudes. Thus, I only pick a set of questions relating to a specific sub-topic among 81 questions of the part Codebook: Module. Similar to the study of Weaver (2008) and Invanova and Tranter (2008), I will deploy three questions which measure the willingness to make trade-offs to protect the environment. The verbatim wordings of the questions are as follow, with “W” as the abbreviation of “willing”:

W<sub>1</sub>: How willing would you be to pay much higher price in order to protect the environment?

W<sub>2</sub>: How willing would you be to pay much higher taxes in order to protect the environment?

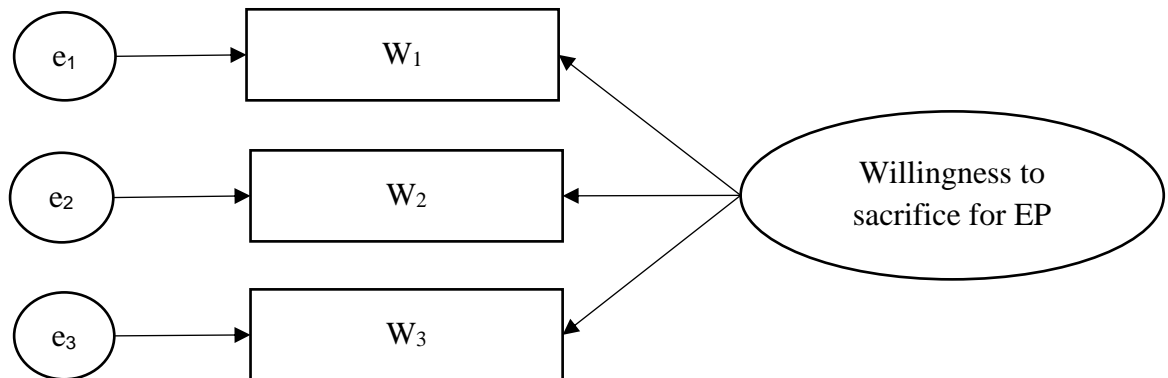
W<sub>3</sub>: How willing would you be to accept cuts in your standard of living in order to protect the environment?

The three questions mentioned above propagate the notion of “personal sacrifice for the greater good” or “willingness to sacrifice” in Weaver’s (2008) words. That said, there is a trade-off between environmental quality and economic growth (Brand 2012). It means one of two factors should be sacrificed to benefit the other. Furthermore, these questions are mostly related to the idea of increasing government spending on environmental issues: if everything was kept equal, then an increase in spending on the environment would mean a budgetary decrease for other social matter(s). As such, the three questions chosen should be able to best express public attitudes towards spending on environment protection.

Although three questions are different as W<sub>1</sub> asks about willingness to “pay much higher price”, W<sub>2</sub> asks about willingness to “pay much higher taxes” and W<sub>3</sub> about willingness to “accept cuts in your standard of living”, the given answers for them are totally similar. The range of the answers is from 1 to 5 in accordance with the descending level of willingness. The respondents will choose 1, if they are “very willing”, 2 for “fairly willing, 3 for “neither willing

or unwilling”, 4 for “fairly unwilling”, and 5 for “very unwilling”. The collected results also categorize those who “can’t choose” or “don’t know” belong to group 8 and those who give no answer (NA) or “refused” to answer to group 9. In total, there will be 32 data points of 15 European countries which can be possibly in use.

As the above set of questions are treated as indicators of public attitudes towards environmental protection in general and entitled as “willingness of sacrifice for environmental protection (EP)”, this specific term will henceforth address the exogenous variable with latent construct in the theoretical model. One of the requirements of the SEM method is that all latent variables are continuous. As a result, I assume that the factor willingness of sacrifice as well as its indicators (which are observed variables) are continuous variables. Figure 7 below represents the dependent paths between willingness to sacrifice and three questions as indicators.



**Figure 7: Measurement model of Willingness to sacrifice for environmental protection.**

Drawn by the author.

### **3.2.2 Mediator: Party positions**

#### **3.2.2.1 The Manifesto Database Project and the Chapel Hill Expert Survey**

The two “contemporary comparative quantitative datasets” used to measure party positions are the Manifesto Project (MARPOR) and the Chapel Hill Expert Survey (CHES) (Carter 2013: 74). With regards to the MARPOR, this is a project developed by Ian Budge and his colleagues in 1979, with the initial title as the Manifesto Research Group (MRG). In MARPOR, researchers analyse election manifestos of parties (in 56 issue categories) from over



55 countries in five continents in order to see where policy stances of a specific party stand on the political spectrum; in other words, to understand parties' policy preferences. The method of counting how many times relevant words or phrases regarding a salient issue emerge in the election manifesto is adopted to analyse to what extent a party centralizes that issue. Apart from MARPOR, CHES is another source of data that can be used when the research relates to partisan issues. The aim of CHES is pretty similar to that of MARPOR revealing through the fact that this expert survey studies the party positions on a variety of domains. Nevertheless, while MARPOR collects data from countries in different continents, CHES solely concentrates on European countries by providing questionnaires on myriad issues. Generally, questions of CHES involve positions of parties on not only EU integration, ideology, EU general, social and economic policies, but also non-EU issues such as immigration, redistribution, decentralization, and environmental policy. Nevertheless, CHES is not the only expert survey that measures party positions. In fact, expert surveys given by Castles and Mair (1983), Huber and Inglehart (1995), and Laver and Benoit (2006) are common datasets used when it comes to identifying policy stances of parties. However, the shared limitation of these expert surveys is the lack of longitudinal data.

Regarding MARPOR, although Gemenis (2013) agrees that it is the most popular data source to examine party preferences, he has pointed out four shortcomings of this project. The first limitation lies in "the theory of the coding scheme" (Gemenis 2013: 4). According to MARPOR, parties prefer to choose valence issues such as low unemployment or low inflation rather than issues having different stances which might result in the failure of parties being re-elected in the following elections. Nonetheless, parties do not always incline to valence issues, but they instead express distinct and bizarre perspectives on the same matter, which will give them more advantages in the party competition. This statement belongs to the finding of Laver (2001) and hence has unveiled the flaw lying in the theory used in MARPOR. Second, Gemenis criticised the document selection of the project. In addition to national election manifestos, the analysis of the project also makes use of other documents, or in Gemenis's words, "proxy documents" such as flyers, local election manifestos, party leaders' speeches, advertisements on newspapers, draft of manifestos, etc. The downside of using these types of documents, according to Gemenis, is the suspected reliability which will potentially cause the imprecision of positions where parties are supposed to take. Coding reliability is the third deficiency. Although there were upgrades in recruiting and training coders in order to ensure their performance could be in line with the standard criteria for reliability (stability, reproducibility

and accuracy - Krippendorff 2004), Gemenis realized that the cause of this problem resulted not only from coders, but also from the “complex nature of the CMP coding scheme” that calls for proper solutions (Gemenis 2013: 12). The last shortcoming is the scaling technique. The first method used in MARPOR is the two-stage factor analysis (Budge 1987: 28-30). This method is, however, claimed to be unsuitable and has been criticised by scholars (Hans and Hönnige 2008; Franzmann 2012), because the relationship between parties and issues is much more complicated than linear relations revealed in the factor analysis. Although the new technique developed by Laver and Budge (1992), a so-called “standard L-R scale”, was ultimately adopted in this project to replace the initial “country-specific factor analysis”, it is not entirely flawless due to its surrounding controversies and critiques. This scale created confusion among countries, as it made the left-right notion different from its conventional understanding (Fuchs and Klingemann 1990).

Having acknowledged deficiencies of MARPOR even prior to the finding of Gemenis (2013), Franzmann and Kaiser (2006) approached this dataset in a different way by dividing issues into two groups: valence issues and positional issues; and developed a new coding scheme, later known as Franzmann-Kaiser dataset, to measure left-right positions based on the dataset of MARPOR. Nevertheless, although the two scholars classified issues into narrow dimensions to address the problem of proximity relations between parties and issues, those dimensions are still general, namely economic and social dimensions. Therefore, this dataset cannot be employed to measure party positions regarding specific areas such as the environment.

Although party positions on the environment have been preliminarily studied (Dalton 2009) by using survey conducted by Benoit and Laver (2006), Carter (2013) utilised the 2010 Chapel Hill Expert Survey (CHES) to research the party politics and the environment since this database pioneered in questioning party positions regarding environmental protection and included non-EU countries. Understanding the limitations of MARPOR as well as the process of transforming manifesto data to left-right positions, using the method of Franzmann-Kaiser dataset, which is complicated and rather error-prone, I will use data from the 2010 CHES with a focus on environmental issues. It is worth noting that the differences between the two datasets, MPD and CHES, are relatively small (Castle and Mair 1983).

### **3.2.2.2 Variable description**

As discussed in the prior part, CHES will be the source of data for the mediator - party positions. Although CHES is the first expert survey investigating party positions towards environmental issues, the number of questions is still very limited. Indeed, the CHES 2010 have two questions asking about party positions towards the environment and the importance or salience of the environment to those parties, while the 2014 CHES only investigates the party positions. Acknowledging that the larger sample size enhances the precision of the model, it is more plausible to employ data of at least two years. Thus, I would only pick one question that is asked in both years, specifically:

P: Environment = Positions towards the environment

The answers for this question range from 0: “strongly support environmental protection even at the cost of economic growth” to 10: “strongly support economic growth even at the cost of environmental protection”, and an option “don’t know” for those who cannot answer. Similar to the independent variable - public attitudes towards environmental issues, party positions are assumed to be a continuous variable to comply with the criterion of SEM.

### **3.2.3 Dependent variable: Government Spending on Environmental Issues**

There are different ways to operationalize environmental policy. For instance, when building the amplification model by examining the impact of both public opinion and environmental movements on the public policy, Agnone (2007) treated legislative outputs as the dependent variable. Other scholars reckon that environmental performance is another factor to address the policy outcomes (Knill, Debus and Heichel 2010: 203, Esty and Porter 2005). However, measuring legislative outputs, i.e. either counting or scrutinising bills, laws, and acts introduced and debated in the national parliament, is rather troublesome. The first method, counting, requires a data set that could cover all bills and laws regarding environment protection in a comparative fashion, whose existence I am not aware of. The second method is qualitative in nature, requires proficiency in multiple languages, and thus falls out of the scope of this research. Therefore, this work chose to stick to another common way to make sense of environmental policy: using government spending on environmental protection. In fact, using government spending in public attitudes research and comparative research is not novel: Soroka and Wlezien (2005) proposed that the changes in government spending occurred in line with public preferences in a variety of spheres including armaments and defence; education;

health and road. However, the environment domain has not been one of the focal areas of their work. Rasinski et al. (1994) studied the degree of public support for government spending on environmental issues, but not the relationship between public support and actual spending. Therefore, the different ways to measure the concept of environmental policy has shown its characteristic as a latent construct that can only be measured through observed variables. Due to the explanation above for selecting appropriate measurement for environmental policy, the variable government spending on environmental protection will be understood as the single indicator representing the factor environmental policy. Thus, I assume that this variable represents for the whole concept of environmental policy and would be treated as an observed variable.

With an aim to run an empirical analysis at the cross-national scale with the focus on European Union (EU) countries, I would rely on Eurostat, whose database involves issues belonging to various sectors and is collected from 28 EU members and 3 other countries outside the EU including Iceland, Norway, and Switzerland. Specifically, the dataset namely “Central government spending by function” with the category “environmental protection” according to the Classification of Functions of Government (COFOG) would be employed. Environmental protection is an umbrella category that covers sub-categories including waste management, wastewater management, pollution abatement, protection of biodiversity and landscape, R&D environmental protection and environmental protection. Additionally, government spending is measured as the percentage of GDP and controlled by the central government.

Since data of ISSP is used to measure the causal variable *public attitudes on environmental protection* (the year 2000 and 2010) and data from CHES in 2010 and 2014 for the observation of the mediator *party positions*, this research will make use of the dataset General government spending on environmental protection in the year 2010 and 2014 to make sure that the responsiveness of governmental actions to public attitudes can be observed within a 4-year cycle, a normal period of a governmental incumbency.

In general, although the amount of money invested on environmental protection has a tendency to increase in most countries from 2010 to 2014, the percentage of GDP on this very matter, however, fluctuates slightly or even decreases in some countries. For instance, Slovakia increased the environmental spending from 289.5 million euro in 2010 to 304.8 million euro in 2014, yet it occupied 1.4% GDP in 2014 while this figure was 1.6% in 2004. As such, the importance of an issue to a nation should be reflected by its occupation in the national budget,

rather than relies on observing how much money is spent. On the other hand, this comparative analysis becomes more intriguing due to the variance between countries given in this dataset.

### **3.3 Tools and additional variables**

In addition to three main variables of the model, environmental tax revenues, CO<sub>2</sub> emissions and GDP per capita are additional variables I use to run alternative models, in which environmental tax revenues is an alternative for government spending on environmental protection, while the two other variables are treated as controlled variables. According to Breznau (2017), the adjustment of government spending is not necessarily an outcome of a policy change (Breznau 2017: 593). Thus, to make sure I do not miss out on or misinterpret any possible effect, I use also an alternative dependent variable: environmental tax revenues. Environmental tax is also considered as a policy instrument (Goulder and Parry 2008) and has been tested whether it correlates with public opinion, specifically their willingness to pay (Kotchen, Boyle, and Leiserowitz 2013). Additionally, CO<sub>2</sub> emissions and GDP per capita whose data is at the country level are controlled in order to eliminate the possibility that the effects of public attitudes on government spending and party positions are in part shared with other factors.

Regarding the tool used for the analysis, the R package *lavaan* is the most appropriate option for two reasons. First, this is an R package designed to deal with SEM analysis and its quality is believed to be equivalent to other widely used programs such as LISREL, EQS, Mplus and AMOS (Rosseel 2012). As those programs are all commercial, R operated as a free and open platform and thus is accessible for all users.

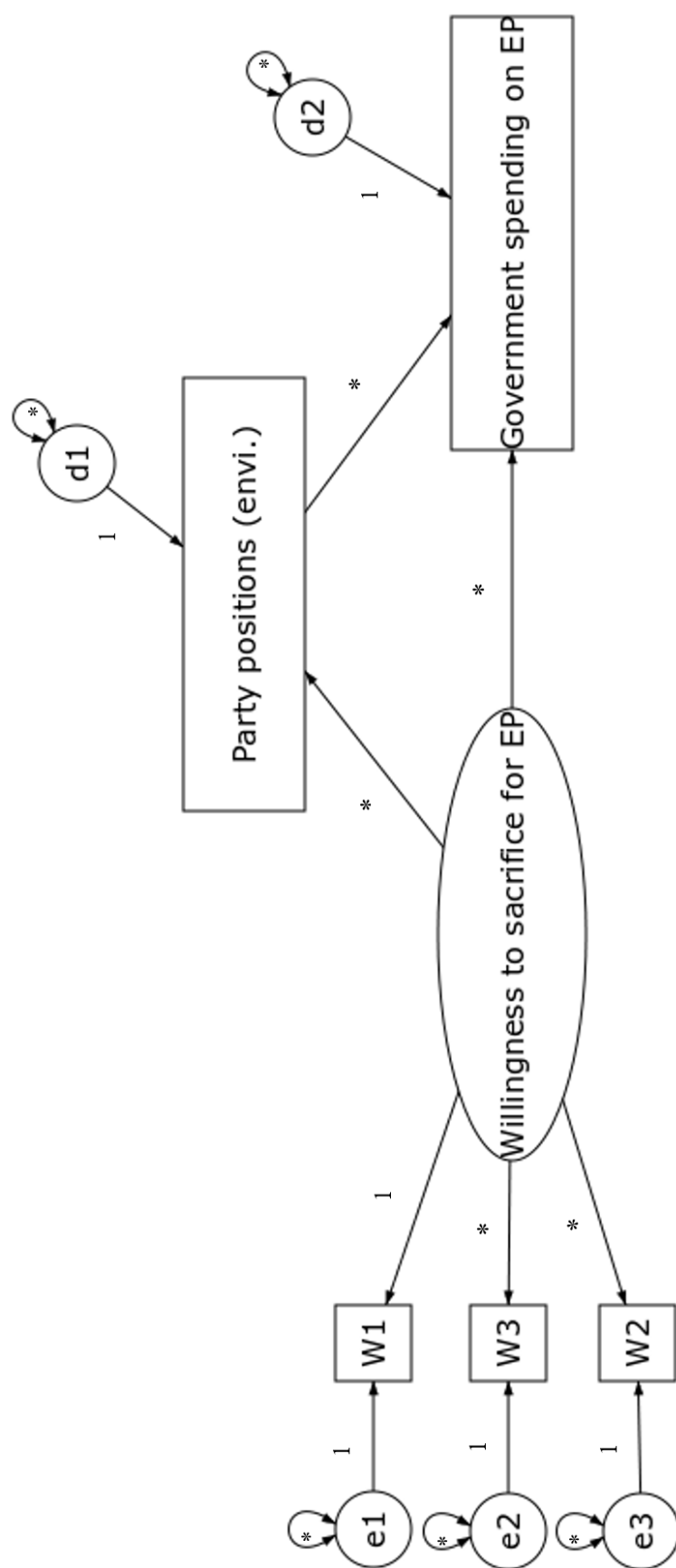
### **3.4 Specification and identification of the theoretical model**

#### **Model specification**

Since all three variables have been demystified in section 3.2, it is necessary to respecify the theoretical model. As aforementioned, three groups of theories and literatures reviewed in Chapter 2 are the foundation for the hypothesised model with relationships of three variables (Figure 8). The unidirectional and straightforward dependent paths between variables seen in the model are key factors to determine that the model is recursive. Effects between variables (including errors and disturbances) are represented by one-way arrows. In this model, the variable *Willingness to sacrifice* (for environmental protection) is an exogenous variable

having impacts on other variables. This latent construct is observed through three indicators, which are actually three questions of the ISSP. *Government spending* (on environmental protection) is an endogenous variable which is not merely affected by *Willingness to sacrifice*, but also by *Party positions*. As a mediator, *Party positions* simultaneously function in this model as an exogenous variable (affects Government spending) and an endogenous variable (affected by Willingness to sacrifice).

Figure 8: The theoretical model



## Model identification

That said, model degrees of freedom ( $df_M$ ) showing the difference between the number of observations ( $p$ ) and the number of unknown parameters ( $q$ ) is an important condition for a hypothesised model to be identified. In Figure 8, there are 5 observed variables ( $W_1$ ,  $W_2$ ,  $W_3$ , Party positions, and Government spending). With  $p = v(v+1)/2$  where  $v$  stands for the number of observed variables, the calculation is  $p = 5(5+1)/2 = 15$ . The sum of unknown parameters (represented by symbol  $*$ ) in Figure 8 is 10 including 5 regression coefficients (one-way arrows), 2 variances (of disturbances  $d_1$  and  $d_2$ ) and 3 covariances (of indicator errors  $e_1$ ,  $e_2$ , and  $e_3$ ). The factor loading of latent factor on  $W_1$ , and of  $e_1$ ,  $e_2$ ,  $e_3$  on  $W_1$ ,  $W_2$ ,  $W_3$  respectively is scaled to 1. Accordingly, the model degrees of freedom can be calculated as  $df_M = p - q = 15 - 10 = 5$ , thus the model is over-identified ( $df_M > 0$ ). For the theoretical model is identified, it is safe to continue with the model estimation in the next chapter.

### 3.5 Limitations

It is undeniable that every research has limitations. The first limitation of this work is the employment of the CHES dataset in 2010 and 2014 to measure party positions, while data for public attitudes are taken from the ISSP 2000 and 2010. The 10-year and 4-year gap between the two datasets reveals the inconsistency of the waiting period to observe the responsiveness of party positions on the change of public attitudes. However, since the CHES in 2002 and 2006 incorporate no question regarding party positions towards environment as in the CHES 2010 and 2014, the flaw must be accepted. With regards to measuring the concept of environmental policy, the environment policy stringency index from the OECD database was initially planned to be utilised. Then I realised that the dataset was troublesome because it only recorded the data of all OECD countries until 2012, after that data of many countries went missing. The other possibilities have already been explained in section 3.2.3 and why they cannot be used. As such, government spending is the most plausible option due its data availability from 1995 to 2018, although I am aware that it might result in bias selection of data.

Apart from shortcomings concerning data, methodology is another issue that should be mentioned in this part. Specifically, ISSP provides data at the individual level while CHES and government spending are at the country level. For that reason, multilevel SEM is a more appropriate method. This method is, however, relatively advanced for the level of a master's student. Thus, I would simply make use of the mediation analysis in the framework of SEM.



The last limitation of this work is related to latent variables and their indicators in SEM. Although latent variables and their indicators can also be categorical, the more complex method is required to deal with this kind of latent variables, and it is out of the scope of this work. As a result, I have to assume that the latent variable as well as its indicators of my hypothesised model are continuous.

## 4. Data analysis and findings

### 4.1 Descriptive statistics and Data Visualizations

The first step in any proper analysis is displaying basic descriptive statistics of the data. Starting with the latent construct, the three variables that theoretically make up the “Willingness to sacrifice personal benefits for the environment” are three survey questions (stated above) from the two waves (2000 and 2010) of the ISSP Environment Module. They are called “Price”, “Tax”, and “Cut” in Table 1 below. After manually removing missing data from non-respondents (listwise deletion), there are 38,923 complete cases, spanning two time points and 17 countries. These countries (whose names are included in the Appendix A.1) are ones who also appear in the CHES surveys, which are exclusive to European countries.

#### Basic descriptive statistics

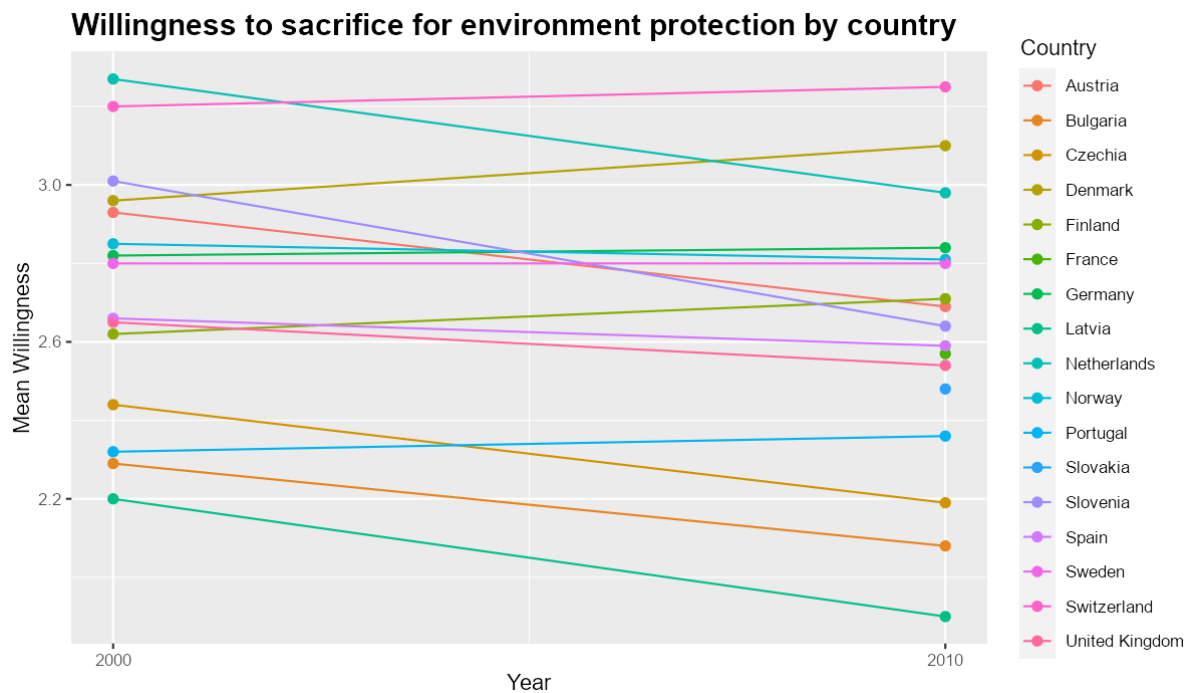
<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>	<i>Skewness</i>
Price	38923	2.82	1.16	4 (1-5)	-0.09
Tax	38923	2.46	1.15	4 (1-5)	0.28
Cut	38923	2.78	1.18	4 (1-5)	-0.06
Willingness	32	2.67	0.34	4(1-5)	NA
Party positions	34	5.07	1.22	4.94 (1.92-6.86)	-1.02
Government spending	34	0.82	0.56	2.4 (0.3-2.7)	1.99
Tax Revenue	34	7.14	1.91	6.9 (4.26-11.16)	0.61
CO2	34	9.27	2.40	8.6 (5.8-14.4)	0.41
GDP	34	22832.94	11320.78	41970 (4050-46020)	0.10

**Table 1:** Basic descriptive statistics of main variables. Owned by author

Casting a quick glance at the means and skewness levels of said variables, one can clearly see the normality of the data, as well as how people across countries and time are divided on this issue. It should be noted that their scales have already been recoded to be more intuitive, with 1 being least willing and 5 being most willing to trade off personal gains for environment protection (it was the opposite in the original surveys). Therefore, if this sample represent the true population, it can be concluded that people are generally not yet ready to make sacrifices for stricter environmental policies. This, however, is just an oversimplification of reality as there should be cleavages across and within societies (e.g. institutions, gender, class, etc.).

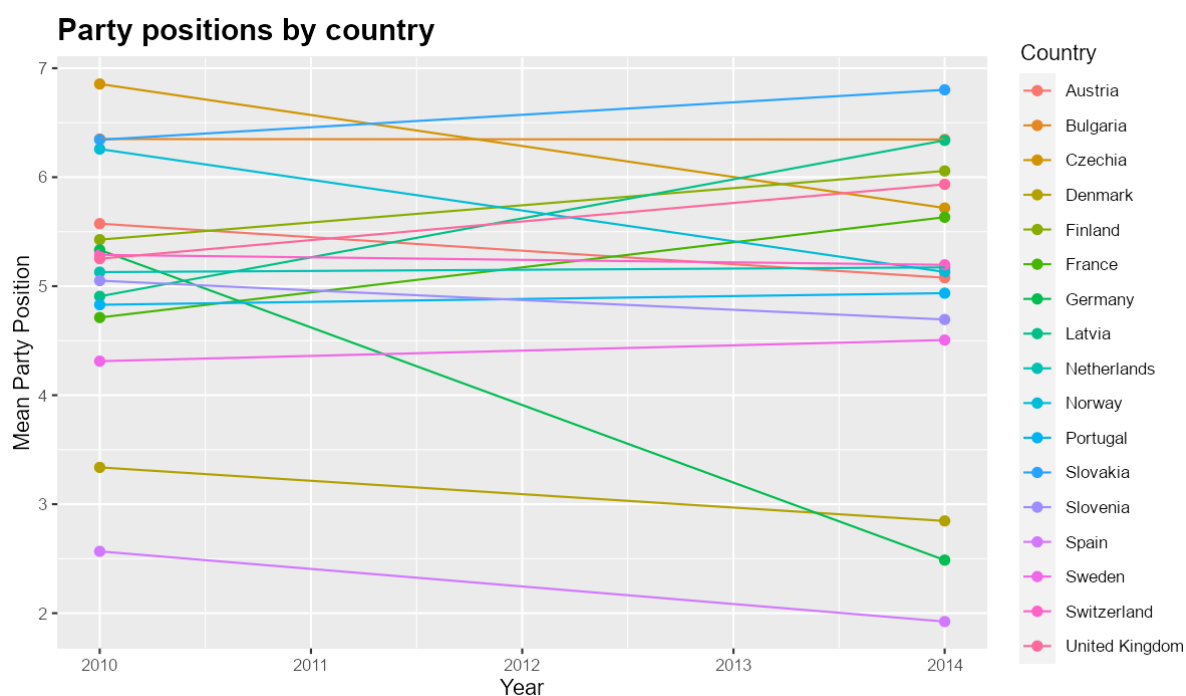
For reasons that will be explained further down the line, because these three variables are “explained” by a common latent construct (or “factor” in factor analysis), a mean value for each country-year will be computed and it will be treated as the latent variable that enters mediation models that include other country-level variables. In SEM, there are constraints that a researcher can set based on theoretical arguments and the model fit indices will dictate how close these constrained models are to reality (observed data). By taking the country-year mean values, I am assuming that this construct called “Willingness to sacrifice” has at least a similar structure across time and space, at least within sample that I have. This invariance, also known as configural invariance, will have to be tested later. For now, by taking mean values, a new variable called “Willingness” will be formed with 32 data points (17 countries multiplied by two time points minus two missing cases of France and Slovenia 2000). A visualization of how this variable differs by country and year is shown in Figure 9 below.

One of the first things that meets the eye is how in most countries, the levels of willingness did not vary much after the first decade of the 21<sup>st</sup> century. When there were changes, the degrees were also not too extreme, usually around half a deviation away from the old means. Switzerland surpassed Netherlands to be the most egalitarian country while post-communist countries such as Bulgaria, Czech Republic and Latvia remained at the bottom. Judging from the figure alone, it is not overreaching to arrive at at least two points: there was an overall downward trend in terms of “willingness to sacrifice” and countries are clustered into groups with specific characteristics. It might not be surprising for researchers of inequality and political economy to see Western European states like Switzerland, Netherlands, Denmark, or Austria take most of the highest positions.



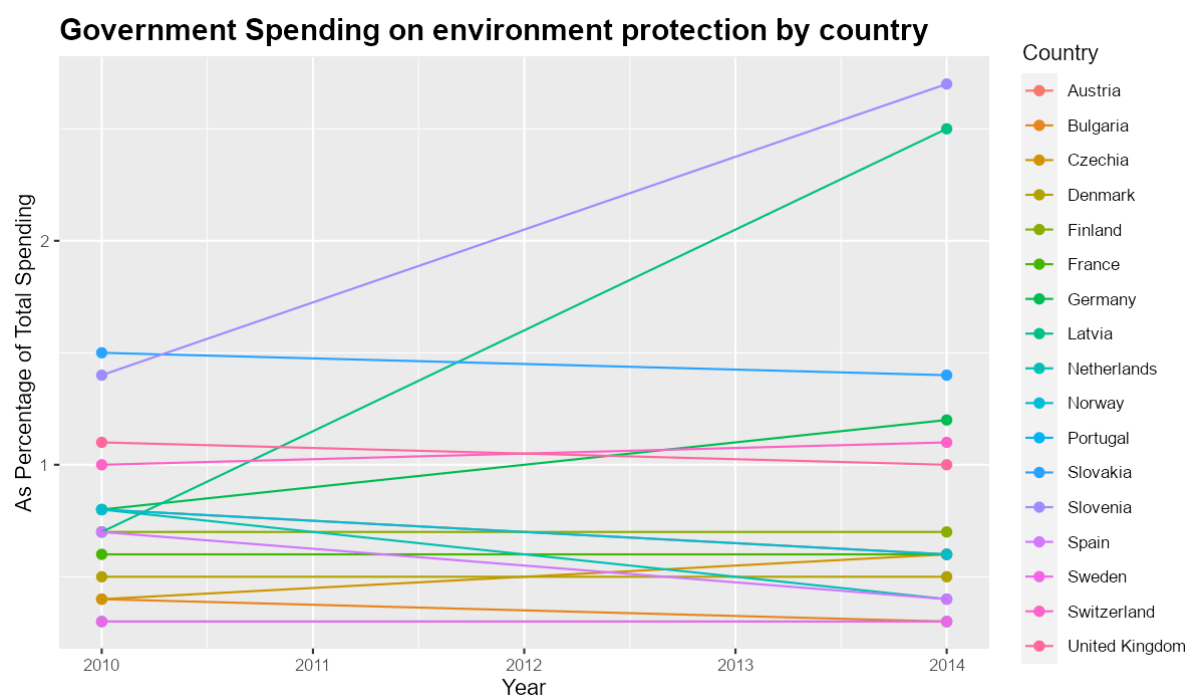
**Figure 9: Mean level of “Willingness to sacrifice one’s benefits for environment protection”.** A variable created by the author, based on data from ISSP Environment 2000, 2010.

The next variable in Table 1 worth discussing is party positions. This variable is calculated in the same way as “willingness”: by taking country-year means. Although there are specific scores for each party’s attitudes toward environment protection from CHES, they cannot be used for regression models. The greatest hurdle here is the fact that the ways parties negotiate and make policies are largely unknown to the public, especially where coalitions govern (consensus democracies). The role of each party in every decision differs from case to case, depending on the salience of that issue (to that party). Therefore, to simplify the problem, I took the mean scores of all parties involved in every national parliament, weighted by the percentage of seats each party holds. The full table including all the information mentioned can also be found in Appendix A.1. That makes a new variable with 34 data points (17 countries in 2010 and 2014), with mean 5.07 and standard deviation 1.22. The mean 5.07 is around the center position on the left-right scale, yet this number does not reveal much as countries’ stances can be much different from each other. This can be visualized in Figure 10 below.



**Figure 10: Mean level of “Party Positions”.** A variable created by the author, based on data from CHES surveys 2010, 2014.

Interestingly, party positions are visually not too close to those of their people. It is rather unexpected for an outsider to see Spain consistently staying at the far left of the spectrum, with Denmark remaining close to it. However, the most striking drift observed was that of Germany, when its party positions toward environment protection dropped from around 5.5 to 2.5, at the edge of far left if the scale is distributed equally. This transformation was in line with the success of the Greens in the 2009 election, when this party for the first time won 10.9% of seats in the federal government. On the other end of the spectrum, post-communist countries such as Slovakia, Bulgaria, or Czech Republic took the more conservative positions. In 2014, however, Czech Republic, took a left turn and became even less averse to environment protection than Finland.

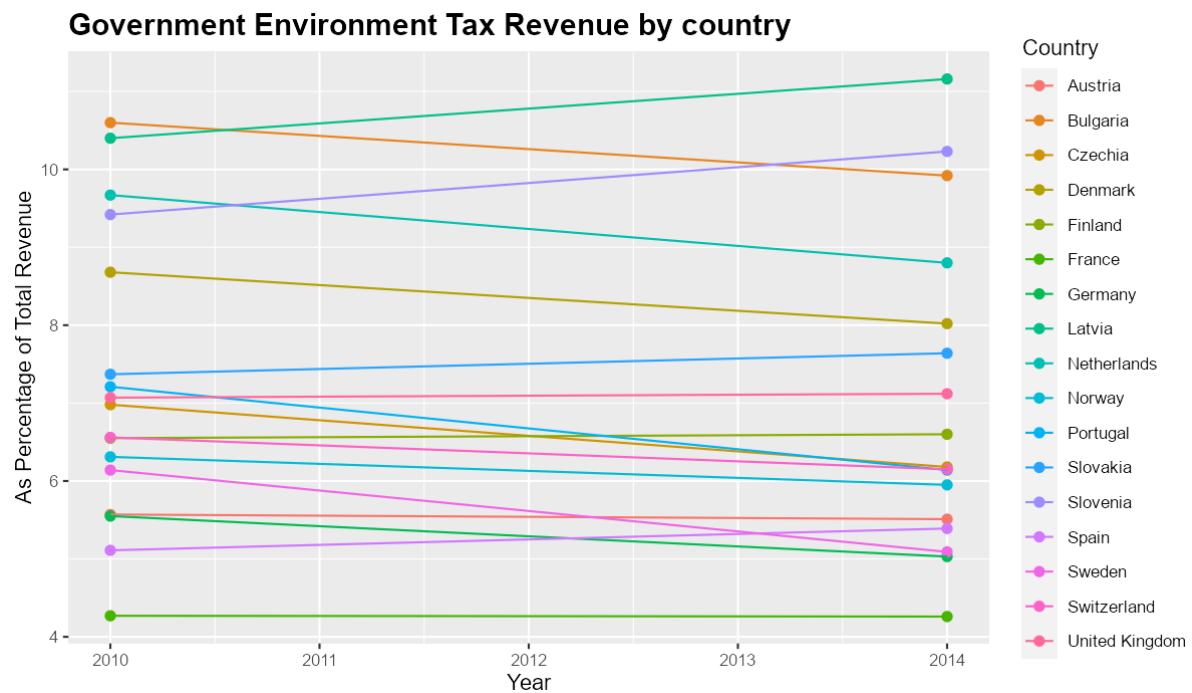


**Figure 11: Government Spending on environment protection by country, as percentage of total government spending (2010, 2014).** Source: Drawn by the author using data from Eurostat

Next on the list is central government (excluding local governments) spending as percentage of total spending on environment protection. This variable also has 34 country-year data points recorded in 2010 and 2014. One thing worth noticing about government spending is that its values are rather low with mean 0.82 and standard deviation 0.56, showing how marginal environmental issues are. In addition, the skewness level is disturbingly high (1.99), probably since a few countries spent much more than the other. A quick look at Figure 11 below reveals this. As can be seen, there was a surge in terms of spending in the year 2014 in Germany and Slovenia, the latter of which is rather surprising given how Slovenia did not have a high level of willingness or a leftist position when it comes to environment protection. Apart from these two cases, other countries seemed to have a stable quota for environment protection throughout the years. This can be a bad sign for upcoming analyses as it points out that spending might not be a good response variable at all because it is not affected by external factors.

This has prompted me to choose an alternative variable for extra tests: environmental tax revenue as a percentage of total tax revenue. I have already explained the choice of this variable in the previous chapter so I will not delve further into this. Descriptive statistics of this variable show some better signs such as a much lower skewness level and a smaller standard deviation over mean ratio, suggesting that there are not many concerning outliers in the data. The visualization (Figure 11), confirms this, as apart from some top tax receivers, which are

surprisingly mainly Eastern European states (Latvia, Bulgaria, Slovenia) and France at the bottom, the rest of the countries are almost indistinguishable, ranging from 5% to 7.5%.



**Figure 11: Government Environment Tax Revenue by country, as percentage of total government spending (2010, 2014).** Source: Drawn by the author using data from Eurostat

## 4.2 Confirmatory Factor Analysis and Measurement Invariance

### Confirmatory factor analysis

The next compulsory step in the procedure is performing a confirmatory factor analysis for the latent construct and testing its equivalence/invariance across groups (in this case time and space). Table 2, 3, and 4 below present results from the CFA.

Latent	Observed Variables	SE	Z	P-Value	CI.Lower	CI.Upper	Standardized Factor Loadings
Willingness to sacrifice	Price	0.000	NA	NA	1.000	1.000	0.863
Willingness to sacrifice	Tax	0.006	156.92	0	0.955	0.979	0.838

Latent	Observed Variables	SE	Z	P-Value	CI.Lower	CI.Upper	Standardized Factor Loadings
Willingness to sacrifice	Cut	0.006	139.629	0	0.812	0.835	0.697

**Table 2:** Factor loadings of the CFA model regressing the latent variable on 3 observed items from the ISSP surveys. Calculated done by the author in R.

First, looking at the standardized factor loadings of the three observed variables, it is fair to say a large portion of these variables can be explained by the common factor. By squaring these loadings, we can tell how many percent of their variances can be explained by the latent construct. In this case, around 74.5% of “Price”, 70.2% of “Tax”, and 48.6% of “Cut” can be credited to the construct. These statistics have passed the lower limit of 40% recommended by Broc & Gana (2019). They (the numbers) are also values of R-squared found in table 3, which basically have the same implications.

Variable	SE	Z	P-Value	CI.Lower	CI.Upper	Standardized Error Variance	R-squared
Price	0.006	61.898	0	0.330	0.351	0.255	0.745
Tax	0.005	73.038	0	0.385	0.406	0.298	0.702
Cut	0.006	116.735	0	0.701	0.725	0.514	0.486

**Table 3:** Standardized error variance of the CFA model regressing the latent variable on 3 observed items from the ISSP surveys. Calculated done by the author in R.

Another detail that calls for attention is the standardized error variance shown in table 3. To remind the readers, error variance is the leftover variance of a variable after having transferred some of its variance to the common factor. Therefore, the value 0.255 of “Price” here is also 25.5% (100% - 74.5%) of the raw, observed variance. Even though the error variance of “Cut” is higher, it can be explained by the fact that it seems to be not as tightly associated as the other two. This is justifiable theoretically, as this question asks for a higher level of sacrifice for the environment. While “paying a higher price” sounds too generic and paying high taxes is common among European welfare states, cutting the standard of living could make people think more about the potential, tangible losses stemming from stricter

environmental policies. This is a widespread problem in mass surveys, as the framing or phrasing of survey questions can occasionally trigger unintended feelings from respondents. Fortunately, in this study, the difference is not large enough to introduce any significant source of systematic error. With very great if not perfect goodness-of-fit indices (CFI = 1, TLI = 1, RMSEA = 0) shown in Table 4, it is safe to conclude that there is a latent worldview that influences how they answer the three questions.

CFI	TLI	RMSEA	AIC	BIC	Chi squared
1	1	0	317089	317141	0

**Table 4:** Goodness-of-fit statistics of the CFA model regressing the latent variable on 3 observed items from the ISSP surveys. Calculated done by the author in R.

### Measurement Invariance

As described in the third chapter, measurement invariance, or multigroup confirmatory factory analysis, is an extremely important step before fitting a full SEM if one wishes to conduct a cross-group analyses, which is the case of this study. Because social and political cleavages are not the focal points of this work, there are only two kinds of groups that need testing: countries and years. Proving that there is measurement invariance across countries and years also justifies the decision to take country-year means of the observed variables to make up the latent construct that enters mediation models.

Starting with “country”, Appendix A.2 shows the goodness-of-fit indices for the configural model. These indices (CFI = 1, TLI = 1, RMSEA = 0) indicate a perfect fit for the basic structure of the latent, which is the minimum requirement of measurement invariance. If any latent construct does not pass this step, there is no point conducting any further analyses. That is certainly not the case here. Table 5 presents the ANOVA test which compares stricter modes of invariance, namely weak – which constrains factor loadings to be equal, strong – loadings plus intercepts, and strict – loadings, intercepts, and residuals. Unfortunately, all the chi-squared differences between the configural model and stricter models are significant, implying that restricted models are statistically different from the baseline model. Nevertheless, having a structural equivalence across groups is enough to acknowledge the relevance of the factor across countries and sufficiently justifies the decision to take country means. The same can be said for “years” (see Appendix A.3 and A.4).



	Df	AIC	BIC	Chisq	Chisq diff	Df diff	Pr(>Chisq)
Configural	0	308388.3	309699.4	0.000	NA	NA	NA
Weak	32	308637.5	309674.4	313.209	313.209	32	0
Strong	64	312528.7	313291.4	4268.453	3955.245	32	0
Strict	112	313679.4	314030.8	5515.186	1246.733	48	0

**Table 5:** An ANOVA test comparing different modes of measurement invariance for the latent variable. Calculated done by the author in R.

### 4.3 Main models: mediation analyses using the SEM framework

As a refresher, the analyses that follow are based on the instructions laid out by Baron and Kenny (1986). They proposed a 3-step procedure for mediation models, including fitting a regression path between the independent variable (X) and the dependent variable (Y) (1), then the path between X and the mediator (M) (2), and finally a full model with M mediating the relationship of X and Y (3). One crucial recommendation from Baron and Kenny is that if the first path does not show any statistical relationship, the procedure should not go any further. However, in a more recent study, Shrout & Bolger (2002) argued that in non-experimental studies where effect sizes are theoretically believed to be small, this “statistical significance should not be a requirement”. In this case, because changes of spending have been shown to be rather small (except for a few outliers), it is not surprising if (1) comes out with no significant coefficients. Moreover, unlike traditional mediation analyses which are more about causal relationships, SEM puts a larger emphasis on the overall structure of variables as well as how close theoretical models are from reality. Therefore, every step will be conducted and explained regardless of the results.

#### Path 1: Predicting Government Spending (Y) with Willingness (X)

The first four models are presented in Table 6 below. All models are fitted using the *sem* function from the *lavaan* package in R, with bootstrapping tests of 1000 simulations as recommended by Shrout & Bulger (2002) for small to moderate size samples. Model M11 is the baseline model which controls for only X (Willingness), Country, and Year. Note that in

all SEM models, variables are assumed to be continuous, which is in this case important for the interpretation of the results. M12 and M13 include two arbitrary group-level control variables CO2 and GDP per capita (shortened as GDP), which are mainly there to see what would happen if potential factors enter the models. CO2 measures how much air waste a country emits to the environment every year and GDP per capita simply shows how wealthy a country is. M14 is the grand model which includes all aforementioned variables.

Results yield no correlations between X and Y, as one might have anticipated from the figures. As I have said, this should not discourage or disrupt the next steps in the procedure. There is a small effect of Country on Spending with the unstandardized coefficient of 0.001 and significance at 90% in all models. It should be noted that because Country is coded according to the ISO 3-digit coding scheme (nominal), 0.001 here should be interpreted as: “When the value of Country increases by 1, the level of Willingness increases by 0.001”. The standardized coefficient is around 0.29, which is small but not negligible. Nevertheless, as the theoretical implication behind this is not relevant (there obviously should be differences in terms of spending across countries), I alternatively run a series of liner regression models where instead of Country, there is a dummy variable called “East”, which is set as 1 for Eastern European countries (Bulgaria, Czech Republic, Slovakia, Slovenia, Latvia) and 0 for the rest. The results are surprising. In all four models, East has a strong, positive relationship with Spending. The beta coefficient stands at 1.22 in the preferred model (the most parsimonious one), which is a substantially large effect size. It indicates that the proportions of budget for environment protection in Eastern European countries are on average 1.22 standard deviation higher than their counterparts. One should not think this equate to better environmental policies because this measurement is not in absolute terms and because there are also other forms of support from the government. Nonetheless, given how recent developments of environmental movements in these countries are, such statistics are impressive. More on this will be conversed about in the discussion. For now, Country will be noted as an important factor that should enter the mediation model.

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### Main Regression Models Regressing Government Spending on Willingness

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	M11	M12	M13	M14
Willingness	-0.167	-0.207	0.271	0.229

<b>Country</b>	0.001* <sup>l</sup>	0.001*	0.001*	0.001*
<b>Year/Wave</b>	0.040	0.044	0.058	0.064
<b>CO2</b>		0.015		0.021
<b>GDP</b>			-0.000	-0.000
Observations	32	32	32	32
R-squared	0.096	0.099	0.140	0.145
AIC	58.052	59.962	58.462	60.272
BIC	63.915	67.290	65.791	69.067

<sup>l</sup> \*\*\* p < 0.01 \*\* p < 0.05 \* p < 0.1 \*

**Table 6:** Main Regression Models Regressing Government Spending on Willingness. Calculated done by the author in R.

Also worth talking about are the fit measures, namely AIC and BIC. These indices punish any extra variables in the model if they do not uncover new pieces of information. For instance, the R-squared of model M14 is 0.145, which means only 14.5% of Willingness' variance can be explained by the 5 covariates included. This is not sufficiently higher than 0.096 of the baseline model, thus M12, M13, and M14 are punished by higher values of AIC and BIC. The most parsimonious model is usually the preferred one. This suggests that among these variables, only Country should not be included when predicting Government Spending (Y).

#### **Path 2: Predicting Party Positions (M) with Willingness (X)**

The next four models regress party positions toward environment protection extracted from the CHES surveys on the willingness to sacrifice of their people. Control variables are kept the same as the first four models, as party positions can also be influenced by the wealth and level of CO2 emission, especially when European countries in this study (except for ) are under the supervision of a supranational entity: the European Union. Results (Table 7) show strong, negative effects of Willingness on Party positions, even when more covariates are controlled for. The negative sign here actually demonstrates a positive relationship as it indicates that as the where willingness to sacrifice is high, parties in general are also “greener”

in their positions (the lower the value the more left-leaning). The beta (standardized coefficient) of willingness is -0.331, meaning for every one standard deviation increase in Willingness, party positions moves 0.3 standard deviation to the left. This is considered as a small but acceptable effect size in the literature (Cohen 1988). Interestingly, as more variables are incorporated into the model, the effect size is also increased, peaking at around -0.5 in M24, which is a moderate effect size. Whether this effect size has been inflated or the “real” effect size has been uncovered by including more variables has a lot to do with the theoretical grounds behind these variables. In fact, there are good reasons to believe that the amount of CO2 emission and GDP per capita (both suggesting the level of development, especially sustainable development of a country) distinguish governments with an environmentally minded from the other. Therefore, although the control variables do not contribute much to explaining the dependent variable (low R-squared), they should be included in the final mediation model.

<b>Main Regression Models Regressing Party positions on Willingness</b>				
	<b>M21</b>	<b>M22</b>	<b>M23</b>	<b>M24</b>
<b>Willingness</b>	-1.210** <sup>1</sup>	-1.511**	-1.713**	-1.925**
<b>Country</b>	0.000	0.000	-0.001	-0.000
<b>Year</b>	-0.062	-0.034	-0.083	-0.053
<b>CO2</b>		0.109		0.103
<b>GDP</b>			0.000	0.000
Observations	32	32	32	32
R-squared	0.134	0.163	0.146	0.172
AIC	106.782	107.684	108.333	109.349
BIC	112.645	115.013	115.662	118.143

<sup>1</sup> \*\*\* p < 0.01 \*\* p < 0.05 \* p < 0.1 \*

**Table 7:** Main Regression Models Regressing Party positions on Willingness. Calculated done by the author in R.

If this modest sample is a true representation of reality, then it could be seen as another evidence for the link between public opinion and party positions in the literature. It should be noted that because the Party positions variable here is the mean positions of all parties, against the background that green parties are rather new and not as influential in decision-making, this is a proof that mainstream parties are also in line with the median voter when it comes to new political issues such as environment protection. More on this matter will be touched upon in the discussion.

### **Full Mediation Model: Party positions mediating the relationship of Willingness and Spending.**

With inputs from previous models, I ran a full mediation model in the SEM framework where M is implied to partially or fully carry the effects of X on Y, controlling for Country in the direct effect (X predicting Y) path as well as CO2 and GDP in the second path (X predicting M). Because there was virtually no significant effect of X directly on Y while there is a statistical association between X and M, there is a very low chance that X might be able to predict Y via the mediator M. Results from Table 8 confirm this anticipation. The effect size (beta) of around -0.493 agrees with what has been found earlier in M21. Other than that, fitting a mediation model does not yield any extra information worth noticing except for a few computation errors probably due to the method chosen.

At this stage, it is safe to conclude that there is at least a strong statistical association (significant at 95%) between Willingness and Party positions, yet no relationship can be established between Willingness and Spending on environment protection. There are a few factors and/or sources of systematic errors that could lead to this outcome. First, government spending is not exactly a perfect choice for the dependent variable, as there are more to environmental policy than simply spending more on environment protection. For example, governments can also impose more environment taxes, activate social campaigns to raise the public's awareness, or fund, subsidize, and support through easing administrative tasks for companies and organizations that focus on renewable energy and sustainable technologies. Moreover, the quota of a new political issue such as environment protection is not likely to be altered significantly as economic development, military, as well as social policy are still top priorities for countries. Lastly, as already acknowledged, there is a time lag between the independent variable and the mediator/dependent variable.

To cope with such shortcomings and also to make sure I do not miss any possible relationships due to said decisions, I will run two more sets of alternative models, each making a slight moderation to the main models. The first set will replace government spending with

environmental tax revenues, with reasons already explained here as well as in the descriptive statistics section. The second set keeps this variable but narrows down to only one time point: 2014. Although a dataset with only 17 cases is very problematic, running this set of models mainly serve the purpose checking the robustness of the willingness - party positions relationship, rather than shedding light on any new one.

#### Full SEM-Mediation Model Testing the Total Effect of Willingness on Spending

	X predicting Y (c)	X predicting M (a)	M predicting Y (b)
Willingness	-0.124	-1.801** <sup>l</sup>	
Party positions			0.076
Country	0.001*		
CO2		0.116	
GDP		0.000	
R2-Spend	0.100		
R2-GovPos	0.166		
Observations	32		
Total Effect	-0.260		

<sup>l</sup> \*\*\* p < 0.01 \*\* p < 0.05 \* p < 0.1 \*

**Table 8:** Full SEM-Mediation Model Testing the Total Effect of Willingness on Spending. Calculated done by the author in R.

#### 4.4 Alternative Models: Using Tax Revenue as the dependent variable (Y)

In the new setup (Table 9), Country no longer has an effect on the new dependent variable. In lieu of that, GDP shows a strong association with tax revenue at 95% confidence level. Although the unstandardized coefficient is visually zero (rounded at 3 decimal points), the standardized coefficient is -0.620, a rather substantial effect size. The reason is because GDP per capita is measured in million of euros and some countries have much higher GDP per

capita than the other. This negative effect suggests that more affluent countries receive lower environmental taxes as a percentage of total tax revenue compared to their counterparts.

<b>Main Regression Models Regressing Government Tax Revenue on Willingness</b>				
	<b>M31</b>	<b>M32</b>	<b>M33</b>	<b>M34</b>
<b>Willingness</b>	-1.729	-1.678	1.003	0.963
<b>Country</b>	0.000	0.000	0.000	0.000
<b>Year</b>	-0.161	-0.165	-0.050	-0.045
<b>CO2</b>		-0.018		0.019
<b>GDP</b>			-0.000** <sup>l</sup>	-0.000**
Observations	32	32	32	32
R-squared	0.105	0.106	0.255	0.256
AIC	135.451	137.439	131.574	133.557
BIC	141.314	144.767	138.902	142.352

<sup>l</sup> \*\*\* p < 0.01 \*\* p < 0.05 \* p < 0.1 \*

**Table 9:** Main Regression Models Regressing Government Tax Revenue on Willingness. Calculated done by the author in R.

We should be careful not to confound this lower tax rates (absolute value) because countries with highest GDP per capita in the group are usually countries with well-developed social security systems where a large part of wage-earners' income goes to taxes and social contributions. In other words, this result might stem from the fact that there are higher taxes in other domains than the environment domain in more economically developed countries. Another interesting point from these models is that around one fourth of environmental tax revenue's variance can be explained simply by the GDP per capita variable (see M33 and M34). This is much larger than the usual 10-15% range found in previous models. This important role

of GDP per capita in the last two models is rewarded with much lower AIC and BIC values, indicating that M33 is the optimal model that should enter the mediation analysis.

Notwithstanding, GDP is no longer the significant control variable if we replace Country with East. In the alternative models (M31a – M34a, see Appendix A.5), East is the only variable that divides the level of environmental tax revenue. Eastern European states' environmental tax incomes contribute to the total tax revenue around 3% more than non-Eastern's. This is in line with the evidence found in M11a – M14a and it again stresses the geographical differences (across Europe) in government finance when it comes to environmental policies. In addition, the fact that the effect of GDP diminishes with the appearance of the East variable shows that there is multicollinearity in the model. A simple linear regression model between the two model confirms this (Appendix A.6). As a result, in the mediation model, the two should not at any point be in the same regression path. Because East gives more information (geographical differences) than GDP per capita, the latter will be removed from the X-Y path.

Because the relationship of Party positions and Willingness has already been explored (M21-M24), I will jump straight to the full mediation model with East as the control variable in the direct effect path, as well as CO2 and GDP in the independent – mediator path. As expected, no new information can be retrieved from this new model due to the lack of statistical association between X and Y. If there is something else worth talking about, it is the much higher R-squared value of Tax Revenue (0.441) due to the substantial effect size (beta: 0.748) of East.

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#### Full SEM-Mediation Model Testing the Total Effect of Willingness on Tax Revenue

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	X predicting Y	X predicting M	M predicting Y
<b>Willingness</b>	0.934	-1.801** <sup>I</sup>	
<b>Party positions</b>			0.005
<b>CO2</b>		0.116	
<b>GDP</b>		0.000	
<b>East</b>	3.117***		



R2-TaxRev	0.441
R2-GovPos	0.166
Observations	32
<b>Total Effect</b>	0.924
<b>Indirect Effect</b>	-0.010

<sup>l</sup> \*\*\* p < 0.01 \*\* p < 0.05 \* p < 0.1 \*

**Table 10:** Full SEM-Mediation Model Testing the Total Effect of Willingness on Tax Revenue. Calculated done by the author in R.

#### 4.5 Validity check: Using only cases from 2010/2014

In this final stage of the empirical analysis, I will again fit all three paths using tax revenue as the dependent variable while constraining to only one time point. The new dataset now has only 17 observations (17 countries), with public opinion data from 2010 and other variables from 2014. This task is like a simple robustness check, whose main purpose is to confirm the validity of the statistical associations found in previous models, namely East – Tax Revenue and Willingness – Party positions.

To achieve this goal, I simply fit another SEM – mediation model with the same elements as in Table 10 using the reduced data set. Overall, the updated results once again verify the basic structure of the two relationships, despite with a few differences in strength, especially in the X predicting M path. More particularly, the standardized coefficient of Willingness on Party positions in this model is -0.790, much larger than in the alternative mediation model (-0.493). On the other hand, the effect size difference is negligible in the case of East – Tax Revenue. Finally, there is an enhancement of Party positions's R-squared value in this model. These new inputs, however, do not bear any meaningful implication and thus do not affect the ultimate interpretation of the findings.

#### Full SEM-Mediation Model Testing the Total Effect of Willingness on Tax Revenue

	X predicting Y	X predicting M	M predicting Y
<b>Willingness</b>	0.862	-3.106 <sup>l</sup>	

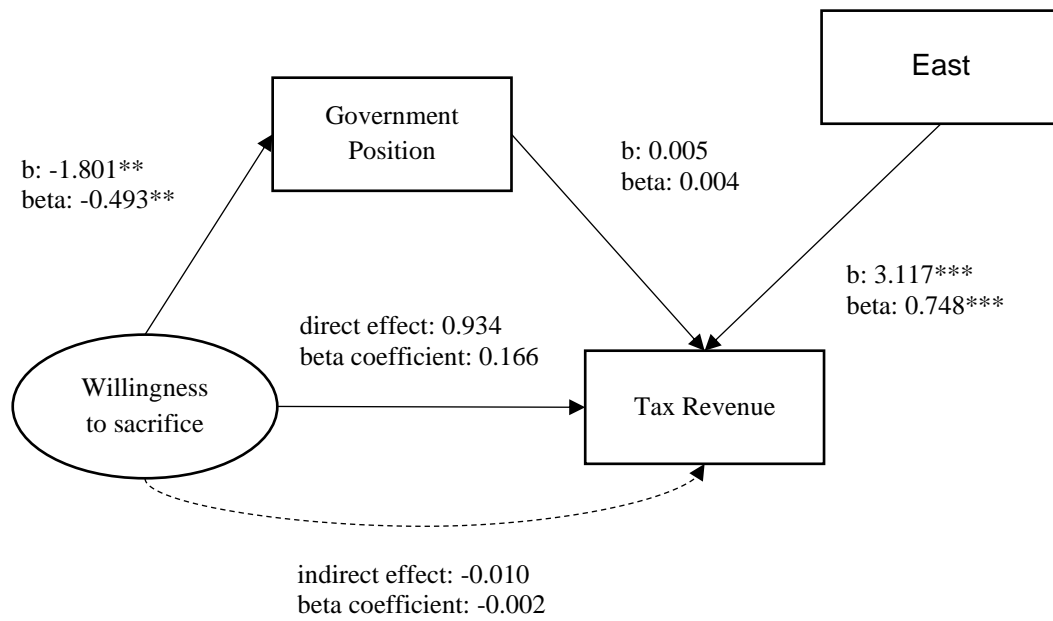
<b>Party positions</b>	0.005
<b>CO2</b>	-0.002
<b>GDP</b>	0.000
<b>East</b>	3.153**
R2-TaxRev	0.447
R2-GovPos	0.266
Observations	17
<b>Total Effect</b>	0.546
<b>Indirect Effect</b>	-0.316

<sup>1</sup> \*\*\* p < 0.01 \*\* p < 0.05 \* p < 0.1 \*

**Table 10:** Full SEM-Mediation Model Testing the Total Effect of Willingness on Tax Revenue. Data from 2014 only. Calculated done by the author in R.

#### 4.6 Chapter conclusion

In this chapter, I set out to find evidence to either accept or reject the three hypotheses laid out in the theoretical discussion. This is done mainly with a technique called Structural Equation Modelling, which allows users to integrate latent variables with multiple regression paths into one model. Another major difference between SEM and the usual multivariate linear regression is the use of a maximum likelihood estimator in place of ordinary least square. In the end, only one out of the three hypotheses (H2) can be accepted while there is not enough statistical evidence to reject the null hypotheses in the other two. Nonetheless, as the analysis progressed, another statistical relationship has been discovered: environmental tax revenue (measured as percentage of total) in Eastern European countries are generally higher than the rest. Although this information seems rather suboptimal (East is only a control variable), it provides some interesting stories for future theoretical discussions. A visualization of the preferred model (Table 10) with coefficients of all the important pathways shown in Figure 13 below.



**Figure 13: A summary of the preferred model.** Drawn by the author based on findings.

## 5. Discussion

From the empirical analysis, there are a few points that need further discussion. Firstly, the consistent effect of public opinion and party positions is particularly interesting sociologists and political scientists alike. In this work, I have shown that in the 17 countries over two periods being sampled, political parties are in general more left-leaning (understood as more supportive of environment protection) when the public is more willing to trade off personal economic and welfare benefits for environment protection. Meanwhile, the link between party positions and environmental policy, hence public opinion and actual policy, manifested by government finance data (government spending and tax revenue) cannot be established. Together they humbly contribute to two subfields of social science: party politics and public opinion – social policy. In particular, the first finding speaks directly to theories of vote maximization (Huber and Powell 1994; Adams et al. 2004, 2006; Adams 2012), as well as the congruence between parties and the public (O’Grady & Chadi 2019, Belchior 2010, Belchior 2013). In a way, this finding suggests that environmental issues are no longer a “new political issue” for niche parties and have become one of the salient issues that parties compete over in elections. On the other hand, the second finding (no relationship between public opinion/party positions and policy) could not only disprove the opinion – policy linkage but also support the idea that partisan effects are gradually waning (Allan and Scruggs 2004, Iversen 2001). These implications, however, are not conclusive. In fact, I am aware of the fact that government

spending and tax revenue are rather poor representations of the complexity of environmental policy. In a hypothetical state where data were more available (for instance, when the OECD Environmental Stringency Index continued) and more public opinion data on the Environment topic existed, the results would be more convincing.

On top of all that, the ways that parties are measured could also use some reworkings. In fact, data collection has proved to be the most challenging task in this thesis: there are very few credible and systematic datasets on parties' attitudes toward environmental issues. For example, all the major datasets on party positions (MARPOR – CMP, CHES, ParlGov, etc.) offer very few to no environment-specific party scores. In the manifesto project, for instance, out of all the salient issues covered, there is only one item dedicated to environmental issues called "Environment Protection: Positive". Meanwhile, CHES surveys did not include any question regarding environment protection (except one question on the EU level) up until 2010. Even then, one question or item to measure parties' attitudes toward environmental problems is an oversimplification of reality, given the multidimensional nature of environmental attitudes (Larson 2008).

The multidimensional environmental attitudes I am getting at here are not similar to the abstract concept of "Willingness to sacrifice for environment protection" put forward in this article. Instead, it is about how people can have different opinions on the "goals (ends), strategies (means), and entities (actors) involved in resource management" (ibid:1). In other words, although all environmentalists would naturally agree on the premise that humans need to preserve and protect the environment for sustainable development, how, by whom, and to what end are questions left unanswered. Let us take climate change as an example. According to a joint release of the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA) on January 15, the latter half of this decade (2015 – 2019) witnessed the warmest temperatures of the last 140 years, with two records in 2016 and 2019. Coupled with that are myriad studies on how rising temperature might affect all facets of life, including agriculture (Hatfield et al. 2011), tropical forests (Slot and Winter 2016), or the maritime ecosystem (Piontek et al. 2009). It seems, therefore, obvious for a normal person that we need to battle climate change to continue to survive as a species. Nevertheless, it is not rare to see climate change deniers, even among top politicians and scientists, or policymakers who are strongly opposed to strict environmental measures. This is because of the belief that there is a trade-off between economic development and environment protection, especially in less developed countries where sustainable technologies are still not advanced enough. This belief actually has its own logic since sustainable and green

development, as I have conversed about in the theoretical discussion, remains largely an “oxymoron” to many.

In the European context, there are good reasons to suspect Eastern European states to be less supportive of strict environmental policies. Not only do these countries lag behind in terms of economic development, they also rank much lower on environment performance rankings. For instance, Bulgaria, Czech Republic, Slovakia, Slovenia, Latvia rank 41<sup>st</sup>, 20<sup>th</sup>, 26<sup>th</sup>, 18<sup>th</sup>, and 36<sup>th</sup> on the Environment Performance Index. Nevertheless, it is evident in this study that the percentage of tax revenue/spending related to environmental issues in Eastern European countries are significantly higher than Western and Southern ones. Although one could argue that more developed welfare states in the West have to spend much more on welfare benefits, and equivalently impose higher income taxes plus contributions, the fact that a good chunk of government income stems from environment tax shows that Eastern European states are compliant with EU laws and serious about their plans to head toward more sustainable development. More studies are needed to confirm this speculation.

On a final note, I should reiterate the fact that all statistical models in this research are based on the assumption that the three survey items contribute equally to the latent construct. By taking row mean of each individual, then calculating country – year means, I am implying that one’s level of “altruism” – or willingness to sacrifice – manipulates how (s)he answers all three questions equally. Understood in another way, it is a weak invariance without actually meeting the criteria of weak invariance. My design there is only a stylized portrayal of reality as there could be multiple sources of systematic errors that might change the dynamics of this balanced relationship. For example, the question which asks whether people are willing to cut one’s standard of living has a different, more severe nuance than the other two. While paying extra taxes or higher prices for services (e.g. water, electricity, transportation) and products are quite common in Europe, the idea of having to give up daily-life conveniences might put a heavy psychological burden on respondents. This could partially explain why this variable’s standardized loadings in confirmatory factor analyses are generally lower than the other two across countries. One way to deal with this is to run a true multilevel structural equation model in which mean structures are calculated in a more sophisticated fashion. In this way, each group (country) can have sample size large enough for a separate model. This, however, is much more method-demanding and thus out of the scope of this thesis.

## 6. Conclusion

This thesis explores the public opinion – public policy linkage in the environment domain. It is based on the dynamic responsiveness model which theorizes the idea that politicians in a democracy constantly observes and anticipates what the public wants to adjust public policy accordingly, thereby securing their chances to win in the next election. Although many studies have been conducted to shed light on this relationship, not many have taken the role of parties as a mediator seriously and even fewer considered that in newer political issues such as environment protection. Therefore, I put forward and set out to verify three major hypotheses, which together cover the pathways of the mediation model in which party positions (when considered together as a cabinet, hence party positions) mediate the relationship of public opinion and environmental policy. As such, the overarching research question is “To what extent do party positions mediate the relationship between public opinion and environmental policy in European countries?”

To answer this question, I employ public opinion data from the ISSP Environment module conducted in 2000 and 2010, party positions data from CHES surveys in 2010 and 2014, as well as government spending on environment protection provided by the European Union. The final data set covers 17 European countries and spans over two time points, or waves: 2010 and 2014. Although coupling public opinion data from 2000 with other data from 2010 (and 2010 with 2014) does not perfectly illustrate reality, nothing else can be done given the scarcity of data on environmental issues. Notwithstanding this stylized model, robustness check using only data from 2010/2014 yielded pretty much similar outcomes, indicating that significant results found are valid at least in the sample under investigation. The technique used in statistical models is Structural Equation Modelling, a framework that allows the inclusion of latent variables and estimating multiple regression paths at the same time using the maximum likelihood estimator.

Out of the three hypotheses, only one can be confirmed: there is a statistical relationship between public attitudes toward environment protection, operationalized as a latent construct called “Willingness to sacrifice for environment protection”, and party positions toward the same issue, measured by taking the weighted mean positions of all parties in the national parliament. In particular, where the public is more willing to trade off personal gains for the environment, parties are also generally “greener” (left-leaning) in their stances. This is true for mainstream and niche parties alike. This finding provides another evidence for the theory stating that parties cater to the median voter and strategize to gain more support from the

general voter even in new political issues like environment protection. Another small yet interesting finding is that Eastern European states are spending a larger part of their budgets on environmental issues, despite falling behind in terms of economic development and environment performance.

Unfortunately, no relationship can be established between public opinion and public policy as the major theory suggests. This disconnection could derive from the fact that government spending and, alternatively, tax revenue are not good indices for environmental policy. Future research can look to remedy this problem, as well as tackling the multilevel nature of data (individual indicators to predict country-level outcomes). For the former, an environmental policy index similar to the discontinued Environmental Policy Stringency Index of OECD should be manually constructed. For the latter, a multilevel structural equation model is necessary. Both, however, requires much more manpower and thus cannot be covered in this thesis. Finally, the measurement of party positions can also be improved by including more items and survey questions to accommodate the complexity and multidimensionality of environmental problems.

## BIBLIOGRAPHY

Adams, J. (2012). Causes and Electoral Consequences of Party Policy Shifts in Multiparty Elections: Theoretical Results and Empirical Evidence. *Annual Review of Political Science*, 15(1), 401–419.

Adams, J., Clark, M., Ezrow, L., & Glasgow, G. (2006). Are Niche Parties Fundamentally Different from Mainstream Parties? The Causes and the Electoral Consequences of Western European Parties' Policy Shifts, 1976-1998. *American Journal of Political Science*, 50(3), 513–529.

Adams, James; Clark, Michael; Ezrow, Lawrence; Glasgow, Garrett (2004): Understanding Change and Stability in Party Ideologies: Do Parties Respond to Public Opinion or to Past Election Results? In *Brit. J. Polit. Sci.* 34 (4), pp. 589–610

Adams, James; Haupt, Andrea B.; Stoll, Heather (2009): What Moves Parties? In *Comparative Political Studies* 42 (5), pp. 611–639

Agnone, J. (2007): Amplifying Public Opinion: The Policy Impact of the US Environmental Movement. In *Social Forces* 85 (4), pp. 1593–1620.

Alesina, A. (1987). Macroeconomic Policy in a Two-Party System as a Repeated Game. *The Quarterly Journal of Economics*, 102(3), 651.

Alesina, A., & Rosenthal, H. (1995). *Partisan Politics, Divided Government, and the Economy* (1st ed.). Cambridge University Press.

Allan, J. P., & Scruggs, L. (2004). Political Partisanship and Welfare State Reform in Advanced Industrial Societies. *American Journal of Political Science*, 48(3), 496–512.

Allport, F. H. (1937). Toward a Science of Public Opinion. *Public Opinion Quarterly*, 1(1), 7.

Baker, Susan (2002). Environmental politics and transition. In Carter, Francis W.; Turnock, David (Eds.) (2002): *Environmental problems of East Central Europe*. 2. ed. London: Routledge (Routledge studies of societies in transition, 16).

Banaszak, Lee Ann; Ondercin, Heather L. (2016): Public Opinion as a Movement Outcome: The Case of the US Women's Movement\*. In *Mobilization: An International Quarterly* 21 (3), pp. 361–378.



- Baron, Reuben M.; Kenny, David A. (1986): The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. In *Journal of Personality and Social Psychology* 51 (6), pp. 1173–1182.
- Belchior, A. M. (2010). Ideological Congruence among European Political Parties. *The Journal of Legislative Studies*, 16(1), 121–142.
- Belchior, A. M. (2013). Explaining Left–Right Party Congruence Across European Party Systems: A Test of Micro-, Meso-, and Macro-Level Models. *Comparative Political Studies*, 46(3), 352–386.
- Bezdek, Roger H.; Wendling, Robert M.; DiPerna, Paula (2008): Environmental protection, the economy, and jobs: National and regional analyses. In *Journal of Environmental Management* 86 (1), pp. 63–79.
- Blake, Donald E.; Guppy, Neil; Urmetzer, Peter (2010): Being Green in BC: Public Attitudes Towards Environmental Issues. *BC Studies: The British Columbian Quarterly*, No 112: Winter 1996/97 / *BC Studies: The British Columbian Quarterly*, No 112: Winter 1996/97.
- Bloom, D. E. (1995): International public opinion on the environment. In *Science (New York, N.Y.)* 269 (5222), pp. 354–358.
- Blumer, H. (1948). Public Opinion and Public Opinion Polling. *American Sociological Review*, 13(5), 542
- Boer, Connie de (2007): Public Opinion. In George Ritzer (Ed.): *Blackwell encyclopedia of sociology online*. Malden, MA: Blackwell Pub.
- Botcheva, L. (1996). Focus and Effectiveness of Environmental Activism in Eastern Europe: A Comparative Study of Environmental Movements in Bulgaria, Hungary, Slovakia, and Romania. *The Journal of Environment & Development*, 5(3), 292–308.
- Bourdieu, Pierre (1979): Public Opinion Does Not Exist. Armand Mattelart/ Seth Siegelau (Eds.): *Communication and Class Struggle* 1. New York: International General: 124–130.
- Brand, Ulrich (2012): Green Economy – the Next Oxymoron? No Lessons Learned from Failures of Implementing Sustainable Development. In *GAIA - Ecological Perspectives for Science and Society* 21 (1), pp. 28–32.
- Breznau, N. (2016). Positive Returns and Equilibrium: Simultaneous Feedback Between Public Opinion and Social Policy. *Policy Studies Journal*, 45(4), 583–612.

- Breznau, Nate (2017): Positive Returns and Equilibrium: Simultaneous Feedback between Public Opinion and Social Policy, in: *Policy Studies Journal*, 45 (4), S. 583 - 612
- Brown, TA (2006), *Confirmatory factor analysis for applied research*. Guilford, New York
- Budge, I. (1987) 'The Internal Analysis of Election Programmes', in Budge, I., Robertson, D., Hearl, D. J. (eds), *Ideology, Strategy and Party Change: Spatial Analyses of Post-war Election Programmes in 19 Democracies*. Cambridge: Cambridge University Press.
- Burstein, Paul (2016): The Impact of Public Opinion on Public Policy: A Review and an Agenda. *Political Research Quarterly*, 56(1), 29-40.
- Busemeyer, M.R. (2009) 'Social democrats and the new partisan politics of public investment in education', *Journal of European Public Policy* 16(1): 107–126.
- Busemeyer, Marius R.; Abrassart, Aurélien; Nezi, Roula (2019): Beyond Positive and Negative: New Perspectives on Feedback Effects in Public Opinion on the Welfare State. In *Brit. J. Polit. Sci.*, pp. 1–26.
- Carter, Francis W.; Turnock, David (Eds.) (2002): *Environmental problems of East Central Europe*. 2. ed. London: Routledge (Routledge studies of societies in transition, 16). Available online at <http://www.loc.gov/catdir/enhancements/fy0649/2001031755-d.html>.
- Carter, Neil (2001): *The politics of the environment. Ideas, activism, policy*. Cambridge: Cambridge University Press.
- Carter, Neil (2013): Greening the mainstream: party politics and the environment. In *Environmental Politics* 22 (1), pp. 73–94.
- Carter, Neil (2014): The politics of climate change in the UK. In *WIREs Clim Change* 5 (3), pp. 423–433.
- Chappell, H. W., & Keech, W. R. (1986a). Party Differences in Macroeconomic Policies and Outcomes. *The American Economic Review*, 76(2), 71–74. JSTOR.
- Chappell, H. W., & Keech, W. R. (1986b). Policy Motivation and Party Differences in a Dynamic Spatial Model of Party Competition. *American Political Science Review*, 80(3), 881–899.
- Childs, Harwood L. (1965): *Public Opinion. Nature, Formation, and Role*. Princeton (NJ): van Nostrand.

Converse, Philip E. (2006): The nature of belief systems in mass publics (1964). In *Critical Review* 18 (1-3), pp. 1–74.

Costantini, Edmond And Kenneth Hanf (1972), Environmental Concern and Political Elites: A Study of Perceptions, Backgrounds, and Attitudes. In *Environment and Behavior* 4 (2), pp. 245–246.

Dalton, Russell J. (1993). ‘The Environmental Movement in Western Europe’, pp.41-68 in *Environmental politics in the international arena: movements, parties, organizations, and policy*, edited by S. Kamieniecki. Albany: State University of New York Press.

Dalton, Russell J. (2009): Economics, environmentalism and party alignments: A note on partisan change in advanced industrial democracies. In *European Journal of Political Research* 48 (2), pp. 161–175.

Dalton, Russell J.; Flanagan, Scott E. (Eds.) (2017): *Electoral Change in Advanced Industrial Democracies. Realignment or Dealignment?* Princeton, NJ: Princeton University Press (Princeton Legacy Library).

Dowell, Glen; Hart, Stuart; Yeung, Bernard (2000): Do Corporate Global Environmental Standards Create or Destroy Market Value? *Management Science*, 46(8), 1059-1074.

Dunlap, R. E.; Xiao, C.; McCright, A. M. (2001): Politics and Environment in America: Partisan and Ideological Cleavages in Public Support for Environmentalism. In *Environmental Politics* 10 (4), pp. 23–48.

Dunlap, Riley E. (1975): The Impact of Political Orientation On Environmental Attitudes and Actions. In *Environment and Behavior* 7 (4), pp. 428–454

Dunlap, Riley E.; Allen, Michael Patrick (1976): Partisan Differences on Environmental Issues: A Congressional Roll-Call Analysis. In *The Western Political Quarterly* 29 (3), p. 384.

Dunlap, Riley E.; Gallup, George H.; Gallup, Alec M. (1993): International Public Opinion Toward The Environment. In *Impact Assessment* 11 (1), pp. 3–25.

Dunlap, Riley E.; York, Richard (2008): The Globalization of Environmental Concern and The Limits of The Postmaterialist Values Explanation: Evidence from Four Multinational Surveys. In *The Sociological Quarterly* 49 (3), pp. 529–563.

Ebbinghaus, Bernhard (2015): Welfare Retrenchment. In : *International Encyclopedia of the Social & Behavioral Sciences*: Elsevier, pp. 521–527.

Erikson, R. (1976) "The relationship between public opinion and state policy: a new look based on some forgotten data." *Amer. J. of Pol. Sci.* 20: 25-36

Erikson, Robert S.; MacKuen, Michael; Stimson, James A. (2002): *The macro polity*. Cambridge: Cambridge University Press (Cambridge studies in public opinion and political psychology).

Esty, Daniel C.; Porter, Michael E. (2005): National environmental performance: an empirical analysis of policy results and determinants. In *Envir. Dev. Econ.* 10 (4), pp. 381–389.

Fagin, Adam and Tickle, Andrew (2002). *Environmental Movements, Nation States, and Globalisation*. In Carter, Francis W.; Turnock, David (Eds.) (2002): *Environmental problems of East Central Europe*. 2. ed. London: Routledge (Routledge studies of societies in transition, 16).

Fernandez, J. J.; Jaime-Castillo, A. M. (2012): Positive or Negative Policy Feedbacks? Explaining Popular Attitudes Towards Pragmatic Pension Policy Reforms. *European Sociological Review*, 29(4), 803-815.

FIRST for Sustainability, Environmental and Social Issues: Land Contamination <https://firstforsustainability.org/risk-management/understanding-environmental-and-social-risk/environmental-and-social-issues/land-contamination/>. Retrieved on 11/07/2020

Franzen, Axel; Vogl, Dominikus (2013): Two decades of measuring environmental attitudes: A comparative analysis of 33 countries. In *Global Environmental Change* 23 (5), pp. 1001–1008.

Franzmann, S. (2012) 'The Manifesto Project from the Perspective of Content Analysis: Logical and Substantial Inferences using MARPOR', prepared for Volkens, A. (eds), *Mapping Policy Preferences III*. Oxford: Oxford University Press.

Franzmann, Simon; Kaiser, André (2016): Locating Political Parties in Policy Space. *Party Politics*, 12(2), 163-188.

Gana, Kamel; Broc, Guillaume (2019): *Structural equation modeling with lavaan*. Hoboken, NJ, London: Wiley; ISTE (Mathematics and statistics).

Gemenis, Kostas (2013): What to Do (and Not to Do) with the Comparative Manifestos Project Data. In *Political Studies* 61 (1\_suppl), pp. 3–23.

- Goulder, L. H.; Parry, I. W. H. (2008): Instrument Choice in Environmental Policy. *Review of Environmental Economics and Policy*, 2(2), 152-174.
- Gunzler, Douglas; Chen, Tian; Wu, Pan; Zhang, Hui (2013): Introduction to mediation analysis with structural equation modeling. In *Shanghai archives of psychiatry* 25 (6), pp. 390–394.
- Hadler, Markus; Wohlkönig, Patrick (2012): Environmental Behaviours in the Czech Republic, Austria and Germany between 1993 and 2010: Macro-Level Trends and Individual-Level Determinants Compared. In *Czech Sociological Review* 48 (3), pp. 467–492.
- Hamilton, Lawrence C.; Colocousis, Chris R.; Duncan, Cynthia M. (2010): Place Effects on Environmental Views. In *Rural Sociology* 75 (2), pp. 326–347.
- Hans, S., Hönnige, C. (2008) ‘Noughts and Crosses: Challenges in Generating Political Positions from CMP-Data’, Kaiserslautern Occasional Papers in Political Science No. 2.
- Harrington, D (2009), Confirmatory factor analysis. Oxford University Press, New York
- Hart, S. and G. Ahuja. 1996. Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance. *Business Strategy and the Environment* 5, 30-37.
- Hatfield, J. L.; Boote, K. J.; Kimball, B. A.; Ziska, L. H.; Izaurralde, R. C.; Ort, D. et al. (2011): Climate Impacts on Agriculture: Implications for Crop Production. *Agronomy Journal*, 103(2), 351-370.
- Herbst, Susan (1993): The meaning of public opinion: citizens' constructions of political reality. In *Media, Culture & Society* 15 (3), pp. 437–454.
- Hibbs, D.A. (1975): Economic interest and the politics of macroeconomic policy, Center for International Studies, Massachusetts Institute of Technology, Monograph C/75-14.
- Hibbs, D.A. (1977): Political parties and macroeconomic policy, *American Political Science Review* 71, 1467-1487.
- Hibbs, D.A. (1992): Partisan theory after fifteen years. *European Journal of Political Economy* 8, 361-373.
- Hicks, Alexander M.; Swank, Duane H. (2013): Politics, Institutions, and Welfare Spending in Industrialized Democracies, 1960–82. *American Political Science Review*, 86(3), 658-674.

- Hoewe, Jennifer (2016): Using Political Journalists' Definitions of Public Opinion to Predict Source Use in Political News. In *Communication Research Reports* 33 (3), pp. 247–252.
- Huber, E. and Stephens, J.D. (2001) *The New Politics of the Welfare State*, Oxford: Oxford UP chapter Welfare State and Employment Regimes in the Era of Retrenchment, pp. 107–145.
- Huber, E. and Stephens, J.D. (2014) 'Partisan Impacts on Social Policy and Distributive Outcomes in the Eras of Welfare State Expansion and Retrenchment', Paper prepared for delivery at the meetings of the American Political Science Association, Washington, DC. August 28-31, 2014.
- 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. JSTOR.
- Huber, J., & Powell, G. (1994). Congruence Between Citizens and Policymakers in Two Visions of Liberal Democracy. *World Politics*, 46(3), 291-326.
- Inglehart, Ronald (1995): Public Support for Environmental Protection: Objective Problems and Subjective Values in 43 Societies. In *PS: Political Science and Politics* 28 (1), p. 57.
- Inglehart, Ronald (2015): *The Silent Revolution: Changing Values and Political Styles Among Western Publics*. Princeton: Princeton University Press.
- Inglehart, Ronald (2017): 2. The Changing Structure of Political Cleavages in Western Society. In Russell J. Dalton, Scott E. Flanagan (Eds.): *Electoral Change in Advanced Industrial Democracies. Realignment or Dealignment?* Princeton, NJ: Princeton University Press (Princeton Legacy Library), pp. 25–69.
- Inglehart, Ronald (Ed.) (1990): *Culture Shift in Advanced Industrial Society*. Princeton, NJ: Princeton University Press.
- Ivanova, Galina; Tranter, Bruce (2008): Paying for Environmental Protection in a Cross-national Perspective. *Australian Journal of Political Science*, 43(2), 169-188.
- Iversen, T. (2001). *The Dynamics of Welfare State Expansion: Trade Openness, Deindustrialization and Partisan Politics*. In P. Pierson (Ed.). *The New Politics of the Welfare State*. Oxford University Press.

- Jacobs, Harvey M. (1995): The Anti-Environmental 'Wise Use' Movement in America. In *Land Use Law & Zoning Digest* 47 (2), pp. 3–8.
- Jenkins, T. (1991), The changing face of central and Eastern Europe and the role of the environmental movement. *Eur. Env.*, 1: 1-4
- Jensen, Carsten (2011) Catching up by transition: globalization as a generator of convergence in social spending, *Journal of European Public Policy*, 18:1, 106-121
- Jochen Mayerl & Henning Best (2019), Attitudes and behavioural intentions to protect the environment: How consistent is the structure of environmental concern in cross-national comparison?, *International Journal of Sociology*, 49:1, 27-52
- Kelli L. Larson (2010) An Integrated Theoretical Approach to Understanding the Sociocultural Basis of Multidimensional Environmental Attitudes, *Society & Natural Resources*, 23:9, 898-907
- Kittel, B. and Winner, H. (2005) 'How reliable is pooled analysis in political economy? The globalization-welfare state nexus revisited', *European Journal of Political Research* 44(2): 269–293.
- Kline, Rex B. (2016): Principles and practice of structural equation modeling. Fourth edition. New York: The Guilford Press (Methodology in the social sciences).
- Knight, Kyle W. (2016): Public awareness and perception of climate change: a quantitative cross-national study. In *Environmental Sociology* 2 (1), pp. 101–113.
- Knill, Christoph; Debus, Marc; Heichel, Stephan (2010): Do parties matter in internationalised policy areas? The impact of political parties on environmental policy outputs in 18 OECD countries, 1970-2000. In *European Journal of Political Research* 49 (3), pp. 301–336.
- Knutsen, Oddbjørn (1988): The Impact of Structural and Ideological Party Cleavages in West European Democracies: A Comparative Empirical Analysis. In *Brit. J. Polit. Sci.* 18 (3), pp. 323–352.
- Korpi, W. 1983. *The Democratic Class Struggle*, London: Routledge and Kegan Paul.
- Kotchen, Matthew J.; Boyle, Kevin J.; Leiserowitz, Anthony A. (2013): Willingness-to-pay and policy-instrument choice for climate-change policy in the United States. *Energy Policy*, 55, 617-625.

Krippendorff, K. (2004) *Content Analysis: An Introduction to its Methodology*, second Edition. Thousand Oaks CA: Sage.

Krippendorff, Klaus (2009): *Content analysis. An introduction to its methodology*. 2. ed., [Nachdr.]. Thousand Oaks, Calif.: Sage Publ

Kumar, Prashant; Ghodeswar, Bhimrao M. (2015): Factors affecting consumers' green product purchase decisions. *Marketing Intelligence & Planning*, 33(3), 330-347.

Laver, M. (2001) 'On Mapping Policy Preferences using Manifesto Data', unpublished paper, Trinity College Dublin.

Laver, M. J.; Budge, Ian (1992): *Measuring Policy Distances and Modelling Coalition Formation*: Palgrave Macmillan UK.

Lazarsfeld, Paul F. (1957): Public Opinion and the Classical Tradition. In *Public Opinion Quarterly* 21 (1, Anniversary Issue Devoted to Twenty Years of Public Opinion Research), p. 39.

Lee, A.-R.; Norris, J. A. (2000): Attitudes Toward Environmental Issues In East Europe. In *Int J Public Opin Res* 12 (4), pp. 372–397.

Loftis, M. W., & Mortensen, P. B. (2017). A new approach to the study of partisan effects on social policy. *Journal of European Public Policy*, 24(6), 890–911.

Lowe, George D.; Pinhey, Thomas K.; Grimes, Michael D. (1980): Public Support for Environmental Protection: New Evidence from National Surveys. In *The Pacific Sociological Review* 23 (4), pp. 423–445.

Manning, Nick (1998): Patterns of environmental movements in eastern Europe. In *Environmental Politics* 7 (2), pp. 100–133.

Manza, J., & Cook, F. L. (2002). A Democratic Polity? *American Politics Research*, 30(6), 630–667.

Marquart-Pyatt, Sandra T. (2012): Environmental Concerns in Cross-National Context: How Do Mass Publics in Central and Eastern Europe Compare with Other Regions of the World? In *Czech Sociological Review* 48 (3), pp. 441–466.

McCright, Aaron M.; Dunlap, Riley E.; Marquart-Pyatt, Sandra T. (2016): Political ideology and views about climate change in the European Union. In *Environmental Politics* 25 (2), pp. 338–358.



Mertig, Angela G.; Dunlap, Riley E. (1995): Public Approval Of Environmental Protection And Other New Social Movement Goals In Western Europe And The United States. In *Int J Public Opin Res* 7 (2), pp. 145–156.

Mertig, Angela G.; Dunlap, Riley E. (2001): Environmentalism, New Social Movements, and the New Class: A Cross-National Investigation\*. In *Rural Sociology* 66 (1), pp. 113–136.

Müller-Rommel, Ferdinand (1985): New social movements and smaller parties: A comparative perspective. In *West European Politics* 8 (1), pp. 41–54.

Müller-Rommel, Ferdinand (2002): The Lifespan and the Political Performance of Green Parties in Western Europe. In *Environmental Politics* 11 (1), pp. 1–16.

Muthén, Bengt; Asparouhov, Tihomir (2015): Causal Effects in Mediation Modeling: An Introduction With Applications to Latent Variables. In *Structural Equation Modeling: A Multidisciplinary Journal* 22 (1), pp. 12–23.

Nawrotzki, Raphael J. (2012): The politics of environmental concern: A cross-national analysis. In *Organization & environment* 25 (3), pp. 286–307.

Neumayer, Eric (2004): The environment, left-wing political orientation and ecological economics. In *Ecological Economics* 51 (3-4), pp. 167–175.

Noelle-Neumann, E. (1974): ‘The spiral of silence: A theory of public opinion’, *Journal of Communication*, 24, 43–51

Noelle-Neumann, E. (1995): ‘Public opinion and rationality’. In Glasser, T. L. and Salmon, C. T. (eds.) *Public Opinion and the Communication of Consent*, New York, Guilford, pp. 33–54

Nordhaus, W. D. (1975). The Political Business Cycle. *The Review of Economic Studies*, 42(2), 169

O’Grady, T., & Abou-Chadi, T. (2019). Not so responsive after all: European parties do not respond to public opinion shifts across multiple issue dimensions. *Research & Politics*, 6(4), 205316801989138.

Page, Benjamin I.; Shapiro, Robert Y. (2014): Effects of Public Opinion on Policy. *American Political Science Review*, 77(1), 175–190.

Pierson, Paul (1993): When Effect Becomes Cause: Policy Feedback and Political Change. In *World Pol.* 45 (4), pp. 595–628.

Pierson, Paul (1998): Irresistible forces, immovable objects: post-industrial welfare states confront permanent austerity. *Journal of European Public Policy*, 5(4), 539-560.

Pierson, Paul (2000): Increasing Returns, Path Dependence, and the Study of Politics. *American Political Science Review*, 94(2), 251-267.

Piontek J, Händel N, Langer G, Wohlers J, Riebesell U, Engel A (2009) Effects of rising temperature on the formation and microbial degradation of marine diatom aggregates. *Aquat Microb Ecol* 54:305-318

Polk, Jonathan, Jan Rovny, Ryan Bakker, Erica Edwards, Liesbet Hooghe, Seth Jolly, Jelle Koedam, Filip Kostelka, Gary Marks, Gijs Schumacher, Marco Steenbergen, Milada Anna Vachudova and Marko Zilovic. 2017. "Explaining the salience of anti-elitism and reducing political corruption for political parties in Europe with the 2014 Chapel Hill Expert Survey data," *Research & Politics* (January-March): 1-9.

Rasmussen, Anne; Reher, Stefanie; Toshkov, Dimitar (2019): The opinion-policy nexus in Europe and the role of political institutions. In *European Journal of Political Research* 58 (2), pp. 412–434.

Redclift, Michael; Woodgate, Graham (1997): *The International Handbook of Environmental Sociology*.

Ritzer, George (Ed.) (2007): *Blackwell encyclopedia of sociology online*. Malden, MA: Blackwell Pub

Rivera, J., & Delmas, M. (2004). Business and Environmental Protection: An Introduction. *Human Ecology Review*, 11(3), 230-234

Rohrschneider, Robert (1990): The Roots of Public Opinion toward New Social Movements: An Empirical Test of Competing Explanations. In *American Journal of Political Science* 34 (1), p. 1.

Rohrschneider, Robert; Miles, Matthew R. (2015): Representation through parties? Environmental attitudes and party stances in Europe in 2013. In *Environmental Politics* 24 (4), pp. 617–640.

Rootes, Christopher (2008): The Transformation of Environmental Activism: An Introduction. In Christopher Rootes (Ed.): *Environmental protest in Western Europe*. Reprinted. Oxford: Oxford Univ. Press (Comparative politics), pp. 1–18.

Rootes, Christopher (Ed.) (2008): Environmental protest in Western Europe. Reprinted. Oxford: Oxford Univ. Press (Comparative politics).

Rootes, Christopher A. (1997). Environmental movement and green parties in western and eastern Europe. In Redclift, Michael; Woodgate, Graham (Ed.): The International Handbook of Environmental Sociology.

Ross, Fiona. 2000. "'Beyond Left and Right': The New Partisan Politics of Welfare." *Governance* 13 (April): 155-83

Rosseel, Yves (2012): lavaan : An R Package for Structural Equation Modeling. *Journal of Statistical Software*, 48(2).

Ryan Bakker, Catherine de Vries, Erica Edwards, Liesbet Hooghe, Seth Jolly, Gary Marks, Jonathan Polk, Jan Rovny, Marco Steenbergen, Milada Anna Vachudova (2015), "Measuring Party Positions in Europe: The Chapel Hill Expert Survey Trend File, 1999-2010," *Party Politics*, 21.1: 143-152.

Schmidt, M. G. (1982). The role of the party in shaping macroeconomic policy, 97-176. In F. G. Castles (Eds.). (1982). *The Impact of parties: Politics and policies in democratic capitalist states*. Sage Publications

Schmidt, Manfred G. (1996): When parties matter: A review of the possibilities and limits of partisan influence on public policy. *European Journal of Political Research*, 30(2), 155-183.

Schmitt, C. (2016). Panel data analysis and partisan variables: How periodization does influence partisan effects. *Journal of European Public Policy*, 23(10), 1442–1459.

Schumacker, Randall E.; Lomax, Richard G. (2016): *A beginner's guide to structural equation modeling*. Fourth edition. New York, London: Routledge Taylor & Francis Group.

Scruggs, Lyle. 2004. *Welfare State Entitlements Data Set: A Comparative Institutional Analysis of Eighteen Welfare States* [Online]. Version 1.2.

Slot M., Winter K. (2016) The Effects of Rising Temperature on the Ecophysiology of Tropical Forest Trees. In: Goldstein G., Santiago L. (eds) *Tropical Tree Physiology*. *Tree Physiology*, vol 6. Springer, Cham.

Smith, Eric R. A. N. (1996): What is public opinion? In *Critical Review* 10 (1), pp. 95–105.

Smith, M. Brewster (1971): A Psychologist's Perspective on Public Opinion Theory. In *Public Opinion Quarterly* 35 (1), p. 36.

Smith, Raymond (1999): Opposition to environmental policies: Contaminated land in Britain. In *Local Environment* 4 (3), pp. 377–383.

Soroka, Stuart N.; Wlezien, Christopher (2005): Opinion–Policy Dynamics: Public Preferences and Public Expenditure in the United Kingdom. In *Brit. J. Polit. Sci.* 35 (4), pp. 665–689.

Stephens, J.D. 1979. *The Transition from Capitalism to Socialism*, Urbana, IL, and Chicago, IL: University of Illinois Press.

Stimson, James A.; Mackuen, Michael B.; Erikson, Robert S. (2013): Dynamic Representation. *American Political Science Review*, 89(3), 543-565.

Suhonen, Pertti (1993): Environmental issues, the Finnish major press, and public opinion. In *Gazette (Leiden, Netherlands)* 51 (2), pp. 91–112.

Switzer, Jacqueline Vaughn (1997): *Green backlash. The history and politics of environmental opposition in the US*. Boulder, Colo.: Lynne Rienner.

Tonner, K. (2000) Consumer Protection and Environmental Protection: Contradictions and Suggested Steps Towards Integration. *Journal of Consumer Policy* 23, 63–78.

Tranter, Bruce (2011): Political divisions over climate change and environmental issues in Australia. In *Environmental Politics* 20 (1), pp. 78–96.

Tufte, E.R. (1978). *Political control of the economy*. Princeton, NJ: Princeton University Press

Turnock, David and Carter, F. W. (2002). Introduction. In Carter, Francis W.; Turnock, David (Eds.) (2002): *Environmental problems of East Central Europe*. 2. ed. London: Routledge (Routledge studies of societies in transition, 16).

van der Heijden, Hein-Anton (1997): Political opportunity structure and the institutionalisation of the environmental movement. In *Environmental Politics* 6 (4), pp. 25–50.

Weaver, A. (2008). Does Protest Behavior Mediate the Effects of Public Opinion on National Environmental Policies? A Simple Question and a Complex Answer. *International Journal of Sociology*, 38(3), 108-125.

Wlezien, Christopher (1995): The Public as Thermostat: Dynamics of Preferences for Spending. In *American Journal of Political Science* 39 (4), p. 981.

Wlezien, Christopher, and Stuart N. Soroka. 2007. "Relationships between Public Opinion and Policy." In *Oxford Handbook of Political Behavior*, ed. Russell Dalton, and Hans-Deiter Klingemann. Oxford: Oxford University Press, 799–817.

Wlezien, Christopher; SOROKA, STUART N. (2012): Political Institutions and the Opinion–Policy Link. *West European Politics*, 35(6), 1407-1432.

## APPENDIX

**Table A.1: Political parties and their positions toward environment protection in 17 European countries (2010 and 2014)**

Country	Year	Party name	Attitude	Percentage Seat	Gov Position
Austria	2010	BZO	7.21	11.48	0.83
Austria	2010	FPO	6.64	18.58	1.23
Austria	2010	Grune	1.14	10.90	0.12
Austria	2010	OVP	6.64	27.87	1.85
Austria	2010	SPO	4.93	31.15	1.54
Austria	2014	FPO	6.00	21.86	1.31
Austria	2014	GRUNE	1.60	13.11	0.21
Austria	2014	NEOS	5.00	4.92	0.25
Austria	2014	OVP	5.80	25.68	1.49
Austria	2014	SPO	4.90	28.42	1.39
Austria	2014	TeamStronach	7.12	6.01	0.43
Bulgaria	2010	DPS	7.00	15.42	1.08
Bulgaria	2010	GERB	6.75	48.75	3.29
Bulgaria	2010	KzB	6.12	16.67	1.02
Bulgaria	2010	NOA	7.29	8.75	0.64
Bulgaria	2010	ODS	5.14	6.25	0.32
Bulgaria	2014	ABV	6.50	4.14	0.27

Bulgaria	2014	ATAKA	8.00	4.52	0.36
Bulgaria	2014	BBT	7.42	5.69	0.42
Bulgaria	2014	BSP	6.67	15.40	1.03
Bulgaria	2014	DPS	7.25	14.84	1.08
Bulgaria	2014	GERB	6.56	32.67	2.14
Bulgaria	2014	SDS	5.60	8.89	0.50
Bulgaria	2014	VMRO-BND	7.54	7.28	0.55
Czechia	2010	CSSD	5.71	28.00	1.60
Czechia	2010	KSCM	6.94	13.00	0.90
Czechia	2010	ODS	8.06	26.50	2.14
Czechia	2010	TOP09	6.88	20.05	1.38
Czechia	2010	VV	7.00	12.00	0.84
Czechia	2014	ANO2011	6.42	18.66	1.20
Czechia	2014	CSSD	5.69	20.46	1.16
Czechia	2014	KDU-CSL	4.58	6.78	0.31
Czechia	2014	KSCM	6.92	14.91	1.03
Czechia	2014	ODS	7.54	7.73	0.58
Czechia	2014	SVOBODNI	8.18	2.47	0.20
Czechia	2014	SZ	0.85	3.20	0.03
Czechia	2014	TOP09	6.25	12.00	0.75

Czechia	2014	USVIT	6.56	6.89	0.45
Denmark	2010	DF	7.36	14.29	1.05
Denmark	2010	EL	0.91	2.29	0.02
Denmark	2010	KF	6.82	10.29	0.70
Denmark	2010	RV	3.00	5.14	0.15
Denmark	2010	SD	4.36	25.71	1.12
Denmark	2010	SF	2.18	13.14	0.29
Denmark	2014	DF	6.89	12.57	0.87
Denmark	2014	EL	0.78	6.86	0.05
Denmark	2014	KF	6.67	4.57	0.30
Denmark	2014	LA	7.75	5.14	0.40
Denmark	2014	SD	4.22	25.14	1.06
Denmark	2014	SF	1.78	9.14	0.16
Finland	2010	KESK	6.22	25.50	1.59
Finland	2010	KOK	6.70	25.00	1.68
Finland	2010	PS	7.40	2.50	0.18
Finland	2010	SDP	6.00	22.50	1.35
Finland	2010	SFP	5.00	4.50	0.22
Finland	2010	VAS	3.80	8.50	0.32
Finland	2010	VIHR	1.10	7.50	0.08



Finland	2014	KESK	6.75	17.50	1.18
Finland	2014	KOK	7.00	22.00	1.54
Finland	2014	PS	8.25	19.50	1.61
Finland	2014	RKP/SFP	5.00	4.50	0.22
Finland	2014	SDP	5.75	21.00	1.21
Finland	2014	VAS	3.50	7.00	0.24
Finland	2014	VIHR	1.00	5.00	0.05
France	2010	FN	8.12	0.00	0.00
France	2010	MODEM	4.11	0.52	0.02
France	2010	MPF	7.57	0.17	0.01
France	2010	NC	5.29	3.81	0.20
France	2010	PCF	5.00	2.60	0.13
France	2010	PRG	3.14	1.21	0.04
France	2010	PS	3.44	32.24	1.11
France	2010	UMP	5.89	54.25	3.19
France	2010	VERTS	0.56	0.69	0.00
France	2014	AC	7.00	0.35	0.02
France	2014	EELV	0.82	2.95	0.02
France	2014	FN	7.55	0.35	0.03
France	2014	MODEM	6.33	0.35	0.02

France	2014	NC	6.57	2.08	0.14
France	2014	PCF	6.36	1.73	0.11
France	2014	PRG	5.30	2.08	0.11
France	2014	PRV	6.67	1.04	0.07
France	2014	PS	5.36	48.53	2.60
France	2014	UMP	7.45	33.62	2.51
Germany	2010	CDU	6.00	31.20	1.87
Germany	2010	CSU	6.00	7.20	0.43
Germany	2010	FDP	6.93	14.95	1.04
Germany	2010	Grunen	2.33	10.93	0.26
Germany	2010	LINKE	4.23	12.22	0.52
Germany	2010	SPD	5.20	23.47	1.22
Germany	2014	CSU	6.18	8.90	0.55
Germany	2014	Grunen	1.45	9.98	0.15
Germany	2014	Linke	4.78	10.14	0.48
Germany	2014	SPD	4.27	30.59	1.31
Latvia	2010	NA	5.00	8.00	0.40
Latvia	2010	SC	6.17	29.00	1.79
Latvia	2010	V	5.29	33.00	1.74
Latvia	2010	ZZS	4.43	22.00	0.97

Latvia	2014	LKS	6.50	1.58	0.10
Latvia	2014	LRA	7.25	6.66	0.48
Latvia	2014	NA	6.33	16.61	1.05
Latvia	2014	NSL	7.25	6.85	0.50
Latvia	2014	SDPS	7.00	23.00	1.61
Latvia	2014	V	6.80	21.87	1.49
Latvia	2014	ZZS	5.67	19.53	1.11
Netherlands	2010	CU	4.67	3.33	0.16
Netherlands	2010	D66	3.82	6.67	0.25
Netherlands	2010	GL	1.55	6.67	0.10
Netherlands	2010	PvdA	4.55	20.00	0.91
Netherlands	2010	PvdD	1.62	1.33	0.02
Netherlands	2010	PVV	8.10	16.00	1.30
Netherlands	2010	SGP	6.50	1.33	0.09
Netherlands	2010	SP	5.36	10.00	0.54
Netherlands	2010	VVD	8.55	20.67	1.77
Netherlands	2014	50PLUS	5.33	1.33	0.07
Netherlands	2014	CU	3.80	3.33	0.13
Netherlands	2014	D66	4.00	8.00	0.32
Netherlands	2014	GL	1.25	2.67	0.03

Netherlands	2014	PvdA	4.75	25.33	1.20
Netherlands	2014	PvdD	0.86	1.33	0.01
Netherlands	2014	PVV	8.20	10.00	0.82
Netherlands	2014	SGP	6.00	2.00	0.12
Netherlands	2014	SP	4.86	10.00	0.49
Netherlands	2014	VVD	7.25	27.33	1.98
Norway	2010	DNA	6.20	37.90	2.35
Norway	2010	FrP	8.50	24.30	2.07
Norway	2010	H	7.00	17.80	1.25
Norway	2010	KrF	4.00	5.90	0.24
Norway	2010	Sp	4.10	6.50	0.27
Norway	2010	SV	1.10	6.50	0.07
Norway	2010	V	1.90	1.20	0.02
Norway	2014	AP	4.33	32.50	1.41
Norway	2014	FrP	8.00	17.20	1.38
Norway	2014	H	6.00	28.40	1.70
Norway	2014	KrF	3.33	5.90	0.20
Norway	2014	MDG	0.67	0.60	0.00
Norway	2014	Sp	4.00	5.90	0.24
Norway	2014	SV	2.00	4.10	0.08

Norway	2014	V	2.33	5.30	0.12
Portugal	2010	BE	2.00	6.96	0.14
Portugal	2010	CDS/PP	6.80	9.13	0.62
Portugal	2010	PS	4.50	42.17	1.90
Portugal	2010	PSD	6.17	35.22	2.17
Portugal	2014	BE	1.50	3.48	0.05
Portugal	2014	PP	6.17	10.43	0.64
Portugal	2014	PS	4.67	32.17	1.50
Portugal	2014	PSD	5.83	46.96	2.74
Slovakia	2010	KDH	6.25	10.00	0.62
Slovakia	2010	Most	5.67	9.33	0.53
Slovakia	2010	SaS	6.69	14.67	0.98
Slovakia	2010	SDKU-DS	6.29	18.67	1.17
Slovakia	2010	Smer	6.36	41.33	2.63
Slovakia	2010	SNS	6.79	6.00	0.41
Slovakia	2014	KDH	6.83	10.67	0.73
Slovakia	2014	MH	6.36	8.67	0.55
Slovakia	2014	OLaNO	5.78	10.67	0.62
Slovakia	2014	SaS	6.45	7.33	0.47
Slovakia	2014	SDKU-DS	6.45	7.33	0.47

Slovakia	2014	Smer-SD	7.15	55.33	3.96
Slovenia	2010	DeSUS	5.22	7.78	0.41
Slovenia	2010	LDS	5.00	5.56	0.28
Slovenia	2010	SDS	6.40	31.11	1.99
Slovenia	2010	SLS-SMS	4.67	5.56	0.26
Slovenia	2010	SNS	5.62	5.56	0.31
Slovenia	2010	Zares	4.50	10.00	0.45
Slovenia	2010	ZLSD	4.20	32.22	1.35
Slovenia	2014	DeSUS	4.90	11.11	0.54
Slovenia	2014	NSI	6.10	5.56	0.34
Slovenia	2014	SD	3.73	6.67	0.25
Slovenia	2014	SDS	6.09	23.33	1.42
Slovenia	2014	SMC	4.60	40.00	1.84
Slovenia	2014	ZaAB	4.60	4.44	0.20
Slovenia	2014	ZL	1.45	6.67	0.10
Spain	2010	BNG	2.57	0.57	0.01
Spain	2010	CC	6.33	0.57	0.04
Spain	2010	CiU	6.00	2.86	0.17
Spain	2010	ERC	3.00	0.86	0.03
Spain	2010	IU	2.33	0.57	0.01

Spain	2010	PNV	6.88	1.71	0.12
Spain	2010	PSOE	4.50	48.29	2.17
Spain	2010	UPD	5.17	0.29	0.01
Spain	2014	Amaiur	5.29	2.00	0.11
Spain	2014	BNG	3.88	0.57	0.02
Spain	2014	CC	3.43	0.57	0.02
Spain	2014	CiU	6.89	4.57	0.31
Spain	2014	ERC	5.43	0.86	0.05
Spain	2014	IU	2.78	3.14	0.09
Spain	2014	PSOE	4.22	31.43	1.33
Sweden	2010	C	4.21	6.59	0.28
Sweden	2010	KD	5.21	5.44	0.28
Sweden	2010	M	5.93	30.66	1.82
Sweden	2010	SAP	4.57	32.09	1.47
Sweden	2010	SD	6.30	5.73	0.36
Sweden	2010	V	1.93	5.44	0.10
Sweden	2014	C	3.68	6.30	0.23
Sweden	2014	KD	5.84	4.58	0.27
Sweden	2014	M	6.16	24.07	1.48
Sweden	2014	SAP	4.21	32.38	1.36

Sweden	2014	SD	7.50	14.04	1.05
Sweden	2014	V	1.79	6.02	0.11
Switzerland	2010	CSP/PCS	3.86	0.50	0.02
Switzerland	2010	CVP/PVC	6.00	15.50	0.93
Switzerland	2010	EDU/UDF	6.50	0.50	0.03
Switzerland	2010	EVP/PEV	5.00	1.00	0.05
Switzerland	2010	FDP/PLR	7.25	15.50	1.12
Switzerland	2010	GLP/PVL	2.00	1.50	0.03
Switzerland	2010	GPS/PES	0.33	10.00	0.03
Switzerland	2010	LdT	7.57	0.50	0.04
Switzerland	2010	PdA/PST-POP	3.11	0.50	0.02
Switzerland	2010	SPS/PSS	2.25	21.50	0.48
Switzerland	2010	SVP/UDC	8.17	31.00	2.53
Switzerland	2014	BDP	6.00	4.50	0.27
Switzerland	2014	CVP/PVC	5.88	14.00	0.82
Switzerland	2014	EVP/PEV	4.57	1.00	0.05
Switzerland	2014	FDP/PLR	7.38	15.00	1.11
Switzerland	2014	GLP/PVL	3.88	6.00	0.23
Switzerland	2014	GPS/PES	0.75	7.50	0.06
Switzerland	2014	LdT	7.14	1.00	0.07



Switzerland	2014	SP/PS	1.88	23.00	0.43
Switzerland	2014	SVP/UDC	8.00	27.00	2.16
United Kingdom	2010	BNP	7.67	0.00	0.00
United Kingdom	2010	CON	6.23	30.70	1.91
United Kingdom	2010	GREEN	0.62	0.00	0.00
United Kingdom	2010	LAB	5.23	55.20	2.89
United Kingdom	2010	LIB	4.15	9.60	0.40
United Kingdom	2010	PLAID	3.44	0.50	0.02
United Kingdom	2010	SNP	4.00	0.90	0.04
United Kingdom	2010	UKIP	7.29	0.00	0.00
United Kingdom	2014	CONS	7.57	47.10	3.57
United Kingdom	2014	GREEN	0.43	0.20	0.00
United Kingdom	2014	LAB	5.00	39.70	1.99
United Kingdom	2014	LIBDEM	3.67	8.80	0.32
United Kingdom	2014	PLAID	3.00	0.50	0.01
United Kingdom	2014	SNP	5.00	0.90	0.04

**Table A.2: Fit measures of the configural invariance model: Country**

CFI	TLI	RMSEA	AIC	BIC	Chisquared
1	1	0	308388	309699	0

**Table A.3: ANOVA test, measurement invariance, Year**

	Df	AIC	BIC	Chisq	Chisq diff	Df diff	Pr(>Chisq)
Configural	0	316581.0	316735.3	0.000	NA	NA	NA
Weak	2	316583.2	316720.3	6.102	6.102	2	0.047
Strong	4	316842.5	316962.4	269.420	263.318	2	0.000
Strict	7	316916.9	317011.2	349.888	80.468	3	0.000

**Table A.4: Fit measures of the configural invariance model: Year**

CFI	TLI	RMSEA	AIC	BIC	Chisquared
1	1	0	316581	316735	0

**Table A.5: M31a – M34a**

	M31a		M32a		M33a		M34a	
<i>Predictors</i>	<i>Estimates</i>	<i>std. Beta</i>	<i>Estimates</i>	<i>std. Beta</i>	<i>Estimates</i>	<i>std. Beta</i>	<i>Estimates</i>	<i>std. Beta</i>
Willingness	0.78	0.14	0.86	0.15	0.55	0.10	0.59	0.10
East	3.07 ***	1.61	3.08 ***	1.62	3.30 ***	1.73	3.41 ***	1.79
Year/Wave	-0.44	-0.23	-0.48	-0.25	-0.47	-0.24	-0.55	-0.29
CO2			-0.04	-0.05			-0.06	-0.08
Top Half					0.40	0.21	0.57	0.30
Observations	32		32		32		32	
R <sup>2</sup> / R <sup>2</sup> adjusted	0.455 / 0.397		0.457 / 0.376		0.459 / 0.379		0.463 / 0.360	
AIC	121.589		123.474		123.370		125.087	
log-Likelihood	-55.794		-55.737		-55.685		-55.544	

\*  $p < 0.1$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ **Table A.6: GDP and East Multicollinearity**

	Predicting GDP	
<i>Predictors</i>	<i>Estimates</i>	<i>std. Beta</i>

East	-19222.67 ***	-0.79
Observations	34	
R <sup>2</sup> / R <sup>2</sup> adjusted	0.617 / 0.605	
AIC	703.605	
log-Likelihood	-348.803	
* $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$		

## Declaration

To the best of my knowledge and belief, I declare that this work is my own work and that I have used no sources other than the ones referred to, especially no further internet resources.

All sources employed have been properly acknowledged and stated in accordance with the rules and regulations that apply to the University of Flensburg. I am aware of the "European Studies" examination regulations related to defraud (§9 PO "European Studies" no.3).

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Surname: Le

Name: Ngoc Lan Vi

Flensburg, 24.09.2020

(Date)

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(Signature of the author)