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Master's Thesis of Political Science and International Relations

Effects of (Post)materialism and Perception as a World Citizen on Climate Change Mitigation Performance

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Abstract

This dissertation aims to examine whether ideational factors have impacts on the countries' climate change mitigation performance by focusing on (post)materialist values and cosmopolitan orientation. It further examines how these variables interact with regime types through statistical analysis and case studies. This paper shows that countries with higher levels of postmaterialism correlate with climate mitigation performance, represented by CO₂ emissions and environmental indicators (CCPI and EPI). Additionally, this study finds out that the effect of postmaterialism, which decreases CO₂, was reversed in authoritarian states thus, increasing the emissions, while the effect of materialism increasing CO₂ became much greater in democratic states. South Korea and Mexico are compared to demonstrate the effect of postmaterialist-materialist value orientation on national performance of climate change mitigation.

This study also finds out that countries with higher level of perception as a world citizen have higher level of performance at preserving ecosystem and natural resources but not necessarily at reducing CO₂ emissions. The positive effect of cosmopolitanism on CO₂ trend decreased in democracies, thus leading to better outcome and vice versa in autocracies. Ukraine and Kazakhstan were compared to illustrate how political regime types moderate the effect of cosmopolitanism on annual trend of CO₂ by examining the activities of civil society and their interaction with the government.

Keyword : Climate Change, Mitigation, Postmaterialism, Materialism, World Citizen, Cosmopolitanism, Environmental Performance
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Chapter 1 Introduction

1.1 Climate Change Mitigation and Ideational Factors

As environmental disasters become intensified with the rise of global temperature, governments around the world are stepping up their efforts to tackle climate change by pledging carbon neutrality and adopting green growth strategies. Moreover, most countries are actively expanding their capacity for producing renewable energy and pushing climate agenda to meet their greenhouse gases mitigation goals (NDC) under the Paris Agreement.¹ Although the paradigm for a low-carbon economy has risen in recent years, international cooperation on environmental issues began in earnest in the aftermath of the 1972 UN Conference on the Human Environment, as countries gathered to sign off multilateral environmental agreements² in the areas of air, water, pollutants, the ocean, nuclear energy and more. As these events occur, studies that attempt to measure and explain national environmental performance have been conducted as well.

The existing literature on national environmental performance largely consists of the studies that focus on the effects of economic variables such as the level of income and GDP per capita, and those that account for socio-political factors, including infrastructure, education, corruption, and political system. According to Environmental Kuznets Curve (EKC) hypothesis, environmental degradation of countries follows an inverted U curve, depending on their economic development. Noting on the hypothesis, many studies have controlled economic variables to find

¹ Paris Agreement was adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC), which was signed to protect climate system by stabilizing concentrations of greenhouse gases in the air in 1992.

² Environmental agreements signed by more than two countries include Montreal Protocol under the Vienna Convention for the Protection of the Ozone Layer, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).

out the effects of sociopolitical factors and argued that higher level of governance and democracy lead to better environmental outcome. Yet the major pitfall of the EKC hypothesis is that it cannot properly explain why some countries have big differences in environmental performances despite having similar income level. Likewise, variables of income, education, and infrastructure have high correlations with the level of democracy, thus making it difficult to explain different environmental outcome among democratic states.

Thus, this study seeks to find out the influence of ideational factors which encompass values, attitudes, norms as alternative predictors. Many studies had pointed out that value judgements by national constituents play an important role in determining policy preferences and setting the priorities of policymaking and policy implementation.³ Moreover, global environmental discourse which had assumed that economic development and environmental preservation were contradictory with each other shifted to seeking economic prosperity without compromising the sustainability of natural system, as exemplified by the concept of sustainable development. Arguably, these were not caused by economic growth alone but accompanied shifts in value orientation and perception.

Thus, this paper aims to find out whether ideational factors influence climate change mitigation performance. Specifically, the study focuses on two ideational variables, (post)materialism and perception as world citizens as a rudimentary step for finding out the effect. Furthermore, it examines how the ideational factors are moderated by political regime types. It also seeks to complement the existing literature that have relied on the 1990s data by using the data released after 2005, the year when the Kyoto Protocol⁴ entered into force and Annex I countries were obliged to reduce greenhouse gases emissions. Based on the

³ Peffley and Hurwitz 1985; Zaller 1992; Miller and Shanks 1996; Feldman 2003; Leiserowitz 2006.

⁴ The Kyoto Protocol set binding emission reduction targets thus having countries, especially those in Annex I to reduce emissions.

data from 2005 to 2014, this paper conducts regression analysis on about 80 countries and comparative case studies.

This paper consists of four chapters. The first chapter reviews the existing literature, which is then followed by hypotheses and explanation on variables used in this paper. The next chapter conducts regression analysis and a case study for the first independent variable, (post)materialism, and chapter three analyses the effect of perception as a world citizen on climate change mitigation performance. The last chapter summarizes main findings and provides conclusions.

1.2 Literature Review and Hypotheses

The concept of environmental performance has been devised from the need to quantify and assess the state of the environment, the impacts of different actors including businesses and governments on the environment and the actions taken in response.⁵ In the public sphere, many international organizations and NGOs have developed indicators to compare environmental stewardship around the world and to provide relevant information to facilitate decision making. Some of the examples include the OECD Environmental Indicators, the UN's Sustainability Development Goal (SDG) Index, Environmental Performance Index (EPI), and Climate Change Performance Index (CCPI).

Existing literature on environmental performance have mainly focused on economic factors, including the level of income and economic development, and socio-political factors, such as characteristics of political system and technological capabilities. One of the most renowned studies in the literature is EKC hypothesis. The hypothesis argues that as economies develop, the level of environmental

⁵ Isabel Gallego-Álvarez, M^a Purificación Vicente-Galindo, M^a Purificación Galindo-Villardón, and Miguel Rodríguez-Rosa, "Environmental Performance in Countries Worldwide: Determinant Factors and Multivariate Analysis," *Sustainability*, Vol. 6 (2014), pp. 7809-7810.

degradation increases up to a certain income level, which is when the degradation begins to reduce (Dasgupta *et al* 2006; Dinda 2004). Following studies pointed out problems with methodologies (Stern 2004) and that the shape of the curve diverges depending on types of pollutants and countries (Perrings and Ansuategi 2000). Moreover, Dasgupta *et al* (2005) asserted that government regulation, rather than income level, is a more significant factor that predicts environmental degradation. Most of all, the EKC hypothesis does not explain why national environmental performance of the countries that have similar income levels differ with one another, thus implying the need to avoid economic determinism.

Other research either set income levels as control variables or seek to analyze economic factors in combination with other variables (Grafton and Knowles 2004; Esty and Porter 2005; Gallego-Alvarez *et al* 2014). Grafton and Knowles, for example, have studied the effect of social capital by setting six environmental indicators, including Environmental Sustainability Index (ESI) as dependent variables, and GDP per capita and population as control variables, yet the outcome did not turn out to be statistically significant.⁶ Gallego-Alvarez *et al* took the approach of analyzing both socio-economic factors and institutional factors that affect the Environmental Performance Index (EPI) by setting economic development, level of education, administrative capabilities, corruption, and political ideologies(liberalism/conservativism) as independent variables. But because the variables that turned out to be statistically significant (economic development, level of education, and corruption) tend to have high correlations with each other and are hard to distinguish their independent effects. The research by Esty and Porter showed that environmental performance is an outcome of not only economic development but also policy choices by studying the effect of environmental regulation and the effects of administrative, scientific, and technological infrastructure. Yet the

⁶ R. Quentin Grafton and Stephen Knowles, "Social Capital and National Environmental Performance: A Cross-Sectional Analysis," *Journal of Environment & Development*, Vol. 13, No. 4 (2004), pp. 337.

variables of environmental regulation and infrastructure, which Esty and Porter set as independent variables, have direct positive effects on environmental performance and are still difficult to explain what led the countries to regulate and enforce environmental restrictions in the first place.

Due to the limitations of the existing studies, this paper seeks to find out whether ideational factors of countries are important predictors of national environmental outcome, especially climate mitigation. Many studies have pointed out that value judgements by national constituents play an important role in determining policy preferences and setting the priorities of policymaking and policy implementation.⁷ Arikan argues that values and cultural beliefs shape political outcomes by forming common expectations and concerns among the members of a society, and narrowing down options to tackle issues.⁸ Parts of the hypothesis correspond with IR constructivist theory which presumes that national behavior is not a mere calculation of costs and benefits but derived from pursuing certain values.⁹

Moreover, recent changes in environmental discourse implies significant shifts in values and beliefs thus showing the influence of ideational factors on environmental outcome. The concept of sustainable development, which was adopted as one of the main pillars of the UN Development goals in 1992 Rio Summit, changed the traditional discourse of perceiving environmental protection and economic development as contradictory with each other. Some countries are also experiencing transformation of values, from materialistic ones that prioritize physical security and economic prosperity towards postmaterialistic values that prioritize self-expression, personal freedom, quality of life.¹⁰ Inglehart's work on

⁷ Peffley and Hurwitz 1985; Zaller 1992; Miller and Shanks 1996; Feldman 2003; Leiserowitz 2006.

⁸ Arikan, Gizem. "Economic Individualism and Government Spending," *World Values Research*, Vol. 4. No. 3. (2011), pp. 76.

⁹ Martin Griffiths, Steven C. Roach and M. Scott Solomon(eds.), *Fifty Key Thinkers in International Relations* (Second Edition), (New York: Routledge, 2009), pp. 123.

¹⁰ Ronald Inglehart, "The Silent revolution in Europe: intergenerational change in post-industrial societies," *American Political Science Review*, Vol. 65 (1971), as cited in Doo-shik Kim, 2005.

postmaterialism has led to many follow-up studies and became a key foundation of World Values Survey. According to Inglehart, (post)materialist values show coherent characteristics in many fields, including political preferences and geographical identity.¹¹ His later work found that postmaterialist countries are more likely to pay costs for environmental protection than materialist countries.¹² Thus, one can hypothesize that (post)materialism has correlations with climate change mitigation as follows:

H1. Countries with higher levels of postmaterialism will correlate with climate change mitigation performance levels.

Another main research theme in environmental performance literature is the question of whether democratic states are better for the environment. Most of the research conclude that more democratic states have higher environmental performance (Barrett and Graddy 2000; Li and Reuveny 2006; Farzin and Bond 2006), yet several studies argue otherwise (Midlarsky 1998; Bättig and Bernauer 2009; Iwinska *et al* 2019). Those who argue that democracies are better for the environment point out that democracy allows its constituents to demand actions for solving environmental problems and that voters who have access to free flow of information can easily get hold of news on environmental degradation and to hold leaders accountable (Frederiksson and Wollscheid 2007; Fiorino 2011). Moreover, democratic states not only tend to be more cooperative in solving global issues, but

“An Empirical Analysis of Environmentalism and Postmaterialism,” *ECO*, Vol. 9 (2005), pp. 137-138.

¹¹ Ronald Inglehart, “The Silent revolution in Europe: intergenerational change in post-industrial societies,” *American Political Science Review*, Vol. 65 (1971), pp. 62.

¹² Ronald Inglehart, “Public Support for Environmental Protection: Objective Problems and Subjective Values in 43 Societies,” *Political Science and Politics*, Vol. 28, No. 1 (1995).

also provide effective governance and have sustainable economic growth than authoritarian states, all of which lead to higher environmental performance.¹³

Having set political and civil freedom as independent variables and pollutants that determine air and water quality as dependent variables, Barrett and Graddy found statistical significance only in air quality variables. Study by Li and Reuveny shows that democracy reduces carbon dioxide emissions, nitrogen dioxide emissions, deforestation, land degradation and organic pollution in water (the sample included 143 countries from 1961 to 1997). Midlarsky, on the other hand, asserts that democratic states have negative relationship with environmental areas, including carbon dioxide emissions and deforestation, except for land protection (the sample includes 98 countries in 1990s), while Bättig and Bernauer find that democracies have positive correlations with political commitment on climate change mitigation and the level of carbon dioxide, but negative correlations with policy outcomes (the sample includes 185 countries from 1990 to 2004). The study by Iwinska *et al* argues that significant correlations between democracy and environmental performance are only valid for the countries with high government effectiveness (the sample includes 180 countries between 2006 to 2014).

The studies on the relationship between democracy and environmental performance has yielded mixed outcomes, which are attributed to different environmental performance index, democracy index, sample countries, and time periods although their assertion is all based on the characteristics of democracy. Although research designs diverged from each other, the mixed result indicates that the relationship between democracy and environmental performance is much more complex thus raising the need to investigate more fundamental factors of environmental performance. Moreover, most of the existing literature relied on the 1990s data, yet using the data beginning from 2005 can yield more accurate analysis

¹³ Daniel J. Fiorino, "Explaining national environmental performance: approaches, evidence, and implications," *Policy Sciences*, Vol. 44, No. 4 (2011), pp. 375.

because the efforts to tackle climate change mitigation as an international community have taken off in 2005.

(Post)materialism can serve as a useful variable for untangling the relationship between political regimes and environmental performances. Especially in democratic countries, value judgement of constituents is ultimately reflected on the policy formation due to an electoral system. Thus, the performance of climate change mitigation by materialistic countries where values of physical and economic safety prevail tend to implement policies designed to promote national security and economic growth at the cost of environment, will be lower than postmaterialistic countries. On the other hand, democracies that are more postmaterialistic value environmental protection as much as physical safety thus, will have higher performance in climate change mitigation. Therefore, it can be argued that:

H2. The effect of postmaterialism on the performance of climate change mitigation level will be stronger in democracies.

Another ideational variable of interest is perception as a world citizen. Because climate change is a global environmental issue not bounded by borders, it is expected that countries made up of cosmopolitan constituents have better performance of climate mitigation. Although the concept of cosmopolitanism has not been strictly theorized, cosmopolitan individuals are generally associated with open attitudes and respect towards foreign cultures¹⁴ and a sense of global justice.¹⁵ Discussions that link cosmopolitanism with environmental outcome have been divided into two opposing views. One is that cosmopolitan consumers are “typically

¹⁴ Z. Skrbis, G. Kendall, and I. Woodward, “Locating cosmopolitanism: between humanist ideal and grounded social category,” *Theory, Culture, & Sociology*, Vol. 21 (2004), as cited in Angela Leung, Kelly Koh, and Kim-Pong Tam, “Being environmentally responsible: Cosmopolitan orientation predicts pro-environmental behaviors,” *Journal of Environmental Psychology*, Vol. 43, (2015), pp. 80.

¹⁵ M. Yegenoglu, “Cosmopolitanism and nationalism in a globalized world,” *Ethnic and Racial Studies*, Vol. 28 (2005), as cited in Leung, Koh, and Tam, 2015, pp. 80.

educated, financially affluent, and early adopters of new (including green) technologies” thus showing more concern for environment and sustainable behaviour.¹⁶ Others argue that cosmopolitan consumers’ cross-national lifestyles are likely to increase carbon footprints.¹⁷ Most studies found a positive relationship between cosmopolitan orientation and pro-environmental attitudes and behaviours, such as awareness,¹⁸ environmental movement support,¹⁹ and sustainable consumption.²⁰ Yet the studies were conducted on individual level and sought to predict pro-environmental behaviours, as opposed to national outcome of climate mitigation. Thus, this paper tests the following hypothesis:

H3. Countries with more people identifying as world citizens will have higher levels of climate change mitigation performance.

This paper will also examine the effect of perception as a world citizen interplaying with political regimes. Regime types will affect the effect of cosmopolitan orientation by serving as a mechanism that shapes different political actors’ attempts to influence policymaking. Democratic system allows and adopts popular concerns and priorities into the process of policymaking, whereas the process in authoritarian system is dominated by the head of the state and small groups of elites. The existing literature that argues democracies are better for environment points out multiple channels that citizens have access to for exerting

¹⁶ Amir Grinstein and Petra Riefler, “Citizens of the (green) world? Cosmopolitan orientation and sustainability,” *Journal of International Business Studies*, Vol. 46, No. 6 (August 2015), pp. 695.

¹⁷ Grinstein and Riefler, 2015, pp. 695.

¹⁸ L. Contorno, “The influence of cosmopolitan values on environmental attitudes: an international comparison,” *Journal of Undergraduate Research*, Vol. 17 (2012), as cited in Leung, Koh, and Tam, 2015, pp. 81-82.

¹⁹ Leung, Koh, and Tam, 2015, pp. 86.

²⁰ Grinstein and Riefler, 2015, pp. 700.

influence, accountability of politicians and their quest for votes as factors leading to better environmental outcome.²¹ Therefore, it can be argued that:

H4. Regime types moderate the effect of perception as a world citizen on the performance of climate mitigation: The effect of more people identifying as world citizens on the performance of climate change mitigation will be stronger in democracies.

1.3 Research Design

1) Dependent variables

The dependent variable is national performance of climate change mitigation that is measured through four indicators, total carbon dioxide (CO₂) emissions (metric tons) per capita, which excludes land use change and forestry (LUCF),²² its annual trend, and two environmental performance indicators, Climate Change Performance Index (CCPI) and Environmental Vitality Indicator from Environmental Performance Index (EPI). Four measures were used due to the comprehensive scale of climate change that is affected not only CO₂ emissions but also changes in ecosystem and energy use.

CO₂ is one of the major global greenhouse gas (GHG) emissions and an important indicator of climate change and this paper evaluates the performance based on its level and trend from 2005 to 2014. Lower values indicate better performance. CCPI ranks 57 countries that make up over 90% of GHG emissions

²¹ Xun Cao and Hugh Ward, "Winning Coalition Size, State Capacity, and Time Horizons: An Application of Modified Selectorate Theory to Environmental Public Goods Provision," *International Studies Quarterly*. Vol. 59 (2015), pp.267.

²² CO₂ emissions that exclude the changes caused by forest and land-use was used to account for the aspects of action by countries and the LUCF data is not generally considered for comparative analysis due to the differences in methodologies by countries.

including non-CO2 GHGs such as methane, nitrous oxide, and F-gases²³ according to their current level and past trend of GHG emissions (40% weighting), development of renewable energy (20% weighting), energy use (20% weighting), and climate policy (20% weighting).²⁴ This indicator is used to account for both policy output and policy outcome (actual reductions in emissions). EPI, devised by Wendling *et al*, evaluates 180 countries' overall performance on two categories, Environmental Health (EH, 50% weighting) and Ecosystem Vitality (EV, 50% weighting). EH reflects environmental effects on human health by accounting for air quality, sanitation, drinking water and waste management, whereas EV is aimed at preserving ecosystem and natural resources. Some of the indicators of EV thus include biodiversity, water resources and GHG emissions.²⁵ I use Ecosystem Vitality (EV) data only to reflect on the comprehensive scale of climate change that results from the loss of natural resources. Higher values of CCPI and EV indicate better performance. All the data were averaged out across two periods (t1 2005 – if not available from 2006 – to 2009, t2 2010-2014) in accordance with independent variables.

2) Independent and Moderating variables

This paper seeks to explain climate change mitigation performance with variables of (post)materialism²⁶ and self-perception as world citizens from World Values Survey (WVS). The WVS is released every five years and this paper used the data from wave 5 which covers from 2005 to 2009 and wave 6 covering from

²³ GHG emissions in CCPI include those covered by the Kyoto protocol: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and F-gases (HFCs, PFCs, SF6)

²⁴ Jan Burck, Ursula Hagen, Christoph Bals, Niklas Hohne, and Leonardo Nascimento, "CCPI Results 2021," (December 2020), pp. 4~5, <https://ccpi.org/downloads/>

²⁵ Z. A. Wendling, J. W. Emerson, D. C. Esty, M. A. Levy, A. de Sherbinin, *et al*, 2018 *Environmental Performance Index*, (New Haven, CT: Yale Center for Environmental Law & Policy, 2018), <https://epi.yale.edu/>.

²⁶ Postmaterialism refers to value orientation that prioritize quality of life and self-expression over physical security and economic stability. Inglehart's work on postmaterialism has led to many follow-up studies and became a key foundation of World Values Survey.

2010 to 2014.²⁷ (Post)materialism data is from its ‘Materialist/postmaterialist 12-item index’ ranging from 0 (materialist) to 5 (post-materialist). The index is calculated based on a set of questions where each answer indicating postmaterialist value is counted as 1 and are summed up as an index (Appendix A).²⁸ Total counts of the indexes were then turned into proportions at national level and the average proportions from wave 5 and wave 6 were used as data. I coded the index ranging 0 to 1 as ‘MATERIALISM’, 2 to 3 as ‘MIXED’ and 4 to 5 as ‘POSTMATERIALISM’.

Likewise, world citizen data is from WVS and derived from the question asking respondents how strongly they agree or disagree with the statement, “I see myself as a world citizen.”²⁹ Each individuals’ responses were counted and then turned into proportions at national level. I coded answers, ‘Strongly Agree’ as ‘world_sa’, ‘Agree’ as ‘world_a’, ‘Strongly Disagree’ as ‘world_sd’ and disagree as ‘world_d.’³⁰ For regime types, this paper uses Polity IV data from Center for Systemic Peace, because the data is derived from measures that focus on regimes and political institutions. I followed their suggested classification by coding the countries into autocracies (-10 to -6), anocracies (-5 to +5), democracies (+6 to +10) based on the level of democracy(polity2). Average data from two periods, t1(2005 to 2009) and t2(2010 to 2014) were used for all the aforementioned variables.

3) Control variables

All models have a set of control variables and a confounding variable. Control variables are the level of income and economic growth to account for the

²⁷ Complete data of Wave7 is still in preparation at present moment

²⁸ The questions used for aggregating the index are included in Appendix A.

²⁹ R. Inglehart, C. Haerpfer, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, E. Ponarin & B. Puranen *et al.* (eds.), World Values Survey: Round Five - Country-Pooled Datafile Version: www.worldvaluessurvey.org/WVSDocumentationWV5.jsp. & www.worldvaluessurvey.org/WVSDocumentationWV6.jsp. (Madrid: JD Systems Institute, 2014), Variable 212.

³⁰ Inglehart *et al.*, 2014.

Kuznets Curve Hypothesis. This paper respectively uses GDP per capita (constant 2010 US\$) and the rate of annual GDP growth from World Development Indicators. A confounding variable is government effectiveness, which indicates perceptions of the quality of public service and policy formulation and implementation, and the credibility of the government's commitment to the policies. Government effectiveness is included as a confounding variable because the indicators reflect policy aspects, known to have high correlations with the effectiveness of government services.³¹ All the variables use the data averaged across two periods, period 1, which is from 2005 to 2009 and period 2, from 2010 to 2014 following the format of WVS data.

	Variables	Definition	Source
DV	CO2	CO2 emissions per capita (metric tons), 2005-2014 averages	World Development Indicators
	CO2T	Average annual growth rate of CO2 emissions per capita, 2005-2014 averages	
	EV	Ecosystem Vitality Indicator from Environmental Performance Index(EPI), 2005-2014 averages	Wendling et al.
	CCPI	Climate Change Performance Index, 2006-2014 averages	Burck et al.
IV	POSTMATERIALISM	Ingleharts' Materialist/postmaterialist 12-item index, averages of wave 5 & wave 6	World Values Survey
	World_a	Self-perception as world citizens, averages of wave 5 & wave 6	
Control Variables	GDPC	GDP per capita (constant 2010 US\$), 2005-2014 averages	World Development Indicators
	GDPG	GDP growth (annual %), 2005-2014 averages	
Confounder	GOVE	Government effectiveness, 2005-2014 averages	Worldwide Governance Indicators
Moderator	polity	Polity2, 2005-2014 averages	Polity IV Project

<Table 1> Variables

³¹ King C.T. Duho, Mark O. Amankwa, Justice I. Musah-Surugu, "Determinants and convergence of government effectiveness in Africa and Asia," *Public Administration and Policy*, Vol. 23, No. 2 (2020), pp. 201.

4) Time Period

This paper studies climate mitigation from 2005 to 2014 mostly because 2005 is the year Kyoto protocol went into force. Annex I countries under the UNFCCC were obligated to meet their reduction targets and mechanisms such as emissions trading and funds to help developing countries to reduce GHG emissions began to be established. Moreover, climate indicators, data, and reports began to be published to keep track of countries' targets from mid-2000s. Thus, this study complements the existing studies that relied on the data from the year before 2005 by using the latest data available.

5) Model

This paper uses multiple linear regression to test the proposed hypotheses because cross-sectional data, averaged for two periods (2005-2009, 2010-2014), is used. The basic model for each hypothesis is as following:

$$(1) y = \beta_0 + \beta_1(\text{POST}) \text{ MATERIALISM} + \beta_2 \text{GDPC} + \beta_3 \text{GDPG} + \beta_4 \text{GOVE} + \varepsilon$$

$$(2) y = \beta_0 + \beta_1(\text{POST}) \text{ MATERIALISM} + \beta_2 \text{polity_Democ} + \beta_3(\text{POST}) \text{ MATERIALISM} * \text{polity_Democ} + \beta_4 \text{GDPC} + \beta_5 \text{GDPG} + \beta_6 \text{GOVE} + \varepsilon$$

$$(3) y = \beta_0 + \beta_1 \text{world_a} + \beta_2 \text{GDPC} + \beta_3 \text{GDPG} + \beta_4 \text{GOVE} + \varepsilon$$

$$(4) y = \beta_0 + \beta_1 \text{world_a} + \beta_2 \text{polity_Democ} + \beta_3 \text{world_a} * \text{polity_Democ} + \beta_4 \text{GDPC} + \beta_5 \text{GDPG} + \beta_6 \text{GOVE} + \varepsilon$$

where y is climate change mitigation performance measured by the level and trend of CO2 emissions, EV, and CCPI. GDPC is economic wealth represented by gross domestic product per capita; GDPG is economic growth measured by annual rate of growth of gross domestic product; GOVE is the level of government effectiveness

represented by Worldwide Governance indicators. This paper also employs models that include interactions between independent variables and political regime types as I expect value orientations of domestic constituents are represented better in democracies.

While this paper conduct regression analysis, it is still difficult to pinpoint the process where ideational variables cause environmental performance and beyond the scope of this paper. Thus, based on existing studies, this study assumes that values along with other ideational variables shape preferences and intentions of both domestic constituents and policymakers, which in turn affect the process of policymaking.

Chapter 2 (Post)Materialism

2.1. Model 1: (Post)materialism

$$(1) y = \beta_0 + \beta_1(\text{POST}) \text{ MATERIALISM} + \beta_2 \text{GDPC} + \beta_3 \text{GDPG} + \beta_4 \text{GOVE} + \varepsilon$$

$$(2) y = \beta_0 + \beta_1(\text{POST}) \text{ MATERIALISM} + \beta_2 \text{polity_Democ} + \beta_3(\text{POST}) \\ \text{MATERIALISM} * \text{polity_Democ} + \beta_4 \text{GDPC} + \beta_5 \text{GDPG} + \beta_6 \text{GOVE} + \varepsilon$$

This chapter uses multiple linear regression analysis to test whether national performance of climate change mitigation will correlate with climate change mitigation performance levels(H1) and the interaction effect of regime types(H2). The dependent variables to measure climate change performance include CO2 emissions per capita (CO2), annual growth rate of CO2 emissions per capita (CO2T) and performance indicators (EV and CCPI). Control variables are GDP per capita (GDPC), and GDP growth (GDPG).

2.2. Results

Regressions were run for a sample of countries for which all data were available. The results from table 2 show that postmaterialism has negative and significant effect on carbon dioxide emissions (CO2), which means better outcome of climate change mitigation. And table 3 shows that materialism has positive and significant effect of carbon dioxide emissions. Yet their effects on annual trend of carbon dioxide emissions (CO2T) are insignificant, thus partly supporting the hypothesis (1). GDPC and GDPG show expected positive and significant signs in most regressions of CO2 except for a negative sign of GDPC in CO2T regression. Moreover, the effect of postmaterialism on other environmental indexes such as

Ecosystem Vitality (EV), and CCPI are positive and significant and vice versa for materialism.

<Table 2> Effects of Postmaterialism

Dependent variable:				
	CO2 (1)	CO2T (2)	EV (3)	CCPI (4)
POSTMATERIALISM	-0.451*** (0.123)	0.001 (0.066)	0.860*** (0.236)	0.537** (0.202)
GDPG	0.0003*** (0.0001)	-0.0001** (0.00003)	-0.0001 (0.0001)	-0.0001 (0.0001)
GOVE	0.471* (0.263)	0.565*** (0.142)	-0.166 (0.462)	-0.452 (0.481)
Constant	2.773 (1.758)	-0.236 (0.941)	39.580*** (3.047)	45.735*** (2.614)
Observations	76	77	75	41
R2	0.456	0.325	0.301	0.232
Adjusted R2	0.425	0.287	0.261	0.147
Residual Std. Error (df = 36)	5.366 (df = 71)	2.931 (df = 72)	9.436 (df = 70)	5.602 (df = 36)
F Statistic (df = 4; 36)	14.882*** (df = 4; 71)	8.648*** (df = 4; 72)	7.524*** (df = 4; 70)	2.726**

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

<Table 3> Effects of Materialism

Dependent variable:				
	CO2 (1)	CO2T (2)	EV (3)	CCPI (4)
MATERIALISM	0.140** (0.061)	-0.017 (0.031)	-0.373*** (0.102)	-0.268** (0.115)
GDPG	0.0003*** (0.0001)	-0.0001** (0.00003)	-0.0001 (0.0001)	-0.00002 (0.0001)
GOVE	0.539* (0.276)	0.577*** (0.142)	-0.105 (0.464)	-0.380 (0.498)
Constant	-5.420** (2.631)	0.355 (1.359)	58.228*** (4.447)	57.420*** (4.553)
Observations	76	77	75	41
R2	0.398	0.327	0.302	0.202
Adjusted R2	0.364	0.290	0.262	0.114
Residual Std. Error (df = 36)	5.645 (df = 71)	2.925 (df = 72)	9.429 (df = 70)	5.711 (df = 36)
F Statistic (df = 4; 36)	11.737*** (df = 4; 71)	8.755*** (df = 4; 72)	7.561*** (df = 4; 70)	2.285*

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

Columns (1) to (4) from Table 4 illustrate results for an interaction of both postmaterialism and materialism with political regime types, classified based on polity score. This paper focused on binary categories, democracies, and autocracies for analysis while the polity data captures regime spectrum in three categories – democracy, autocracy and anocracy. Figure 1 shows a general direction of interaction effect of each regime types and thus for accurate results, please refer to the following interpretation.

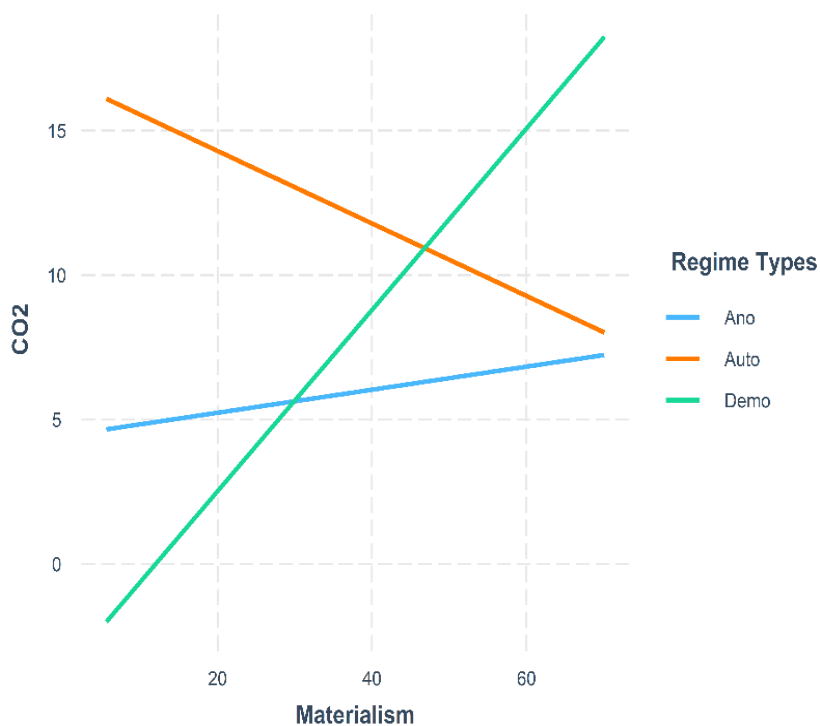
Columns (1) and (2) of Table 4 show that interaction terms of postmaterialism are statistically significant only for autocracies. A unit increase of postmaterialism in autocracies reverses the negative effect of postmaterialism (the effect of improving environmental outcome), thus increasing CO2 emission level. Columns (3) and (4) show that interaction terms of materialism are significant only for democracies and that a unit increase of materialism in democracy increases CO2 emissions 0.273 more than non-democracies. The partial results where interaction effects of postmaterialism are valid only for autocracies might be because channels to express postmaterialist value orientations are supervised or suppressed under authoritarian regimes, thus making interests of materialists that tend to rule through developmental incentives prevail. Nonetheless, it is hard to pinpoint why the interaction terms for democracies are not significant.

Table 5 shows interaction terms for CO2T that have the same signs as CO2 in most regressions but none of them are statistically significant. Possible reasons for this might be because the distribution of post-materialist value orientations tends to change slowly, thus making it difficult to be reflected on annual changes of CO2. Overall, the mixed results partly support the hypothesis (2) – the effect of postmaterialism on the performance of climate change is stronger in democratic regimes and weaker in authoritarian regimes.

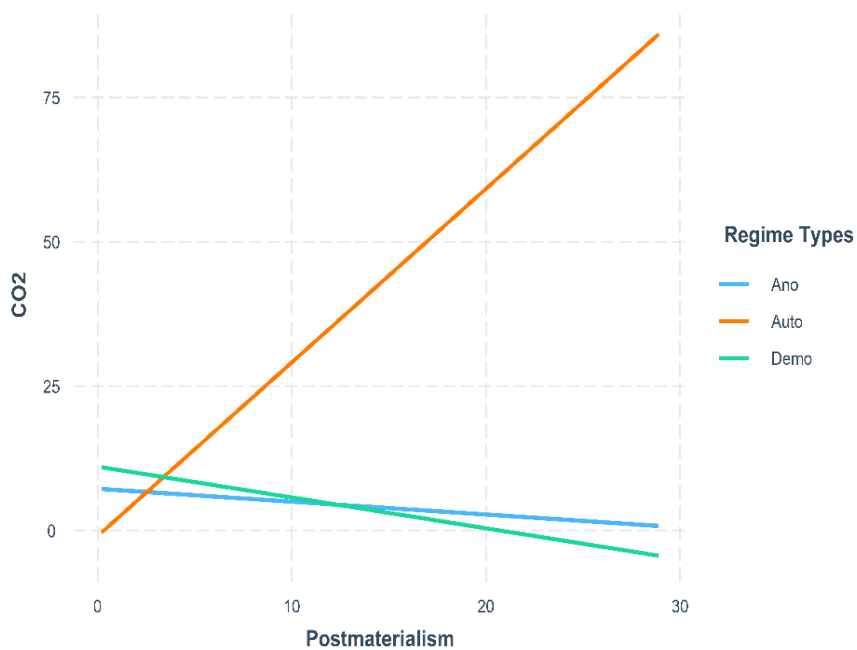
<Table 4> Interaction Effects of Polity on CO2

Dependent variable:				
	CO2			
	(1)	(2)	(3)	(4)
POSTMATERIALISM	-0.149 (0.311)	-0.441*** (0.128)		
MATERIALISM			0.048 (0.078)	0.131** (0.063)
polity_Demo	4.176* (2.501)		-8.987* (4.919)	
polity_Auto		-10.612** (4.974)		16.570 (13.051)
GDPG	0.0004*** (0.0001)	0.0002*** (0.0001)	0.0003*** (0.0001)	0.0002*** (0.0001)
GDPG	0.502* (0.286)	0.103 (0.284)	0.519* (0.295)	0.244 (0.318)
GOVE	-0.410 (1.275)	1.278 (1.145)	-0.246 (1.345)	0.184 (1.275)
POSTMATERIALISM:polity_Demo	-0.488 (0.337)			
POSTMATERIALISM:polity_Auto		3.579*** (1.080)		
MATERIALISM:polity_Demo			0.273** (0.128)	
MATERIALISM:polity_Auto				-0.288 (0.313)
Constant	0.314 (2.412)	4.867*** (1.718)	-2.034 (3.891)	-3.858 (2.818)
Observations	73	73	73	73
R2	0.492	0.563	0.442	0.438
Adjusted R2	0.445	0.524	0.391	0.387
Residual Std. Error (df = 66)	5.378	4.983	5.636	5.652
F Statistic (df = 6; 66)	10.637***	14.198***	8.701***	8.584***
Note:	*p<0.1; **p<0.05; ***p<0.01			

Effects of Materialism on CO2 Emissions by Regime Types



Effects of Postmaterialism on CO2 Emissions by Regime Types



<Figure 1> Interaction Effects of Polity on CO2

<Table 5> Interaction Effects of Polity on CO2T

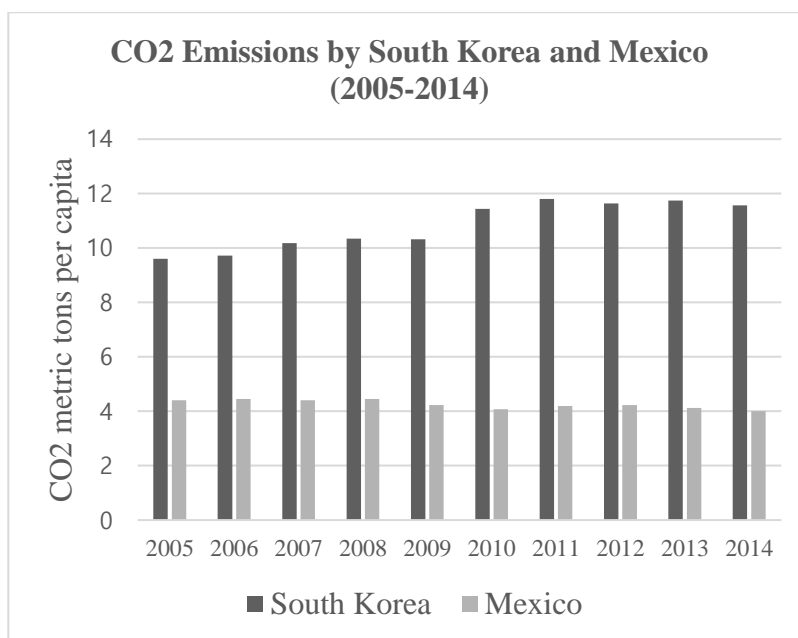
Dependent variable:				
	CO2T			
	(1)	(2)	(3)	(4)
-				
POSTMATERIALISM	0.026 (0.173)	-0.032 (0.074)		
MATERIALISM			-0.043 (0.041)	-0.012 (0.032)
polity_Demo	-1.260 (1.370)		-2.617 (2.589)	
polity_Auto		-0.509 (2.910)		-7.411 (6.749)
GDPG	-0.0001** (0.00003)	-0.00004 (0.00004)	-0.0001** (0.00003)	-0.0001 (0.00003)
GDPG	0.498*** (0.158)	0.758*** (0.165)	0.496*** (0.155)	0.742*** (0.163)
GOVE	0.998 (0.707)	0.300 (0.670)	1.111 (0.707)	0.342 (0.659)
POSTMATERIALISM:polity_Demo	0.0004 (0.186)			
POSTMATERIALISM:polity_Auto		-0.563 (0.632)		
MATERIALISM:polity_Demo			0.034 (0.067)	
MATERIALISM:polity_Auto				0.116 (0.162)
Constant	0.685 (1.339)	-0.839 (0.986)	2.559 (2.047)	-0.439 (1.453)
-				
Observations	74	74	74	74
R2	0.330	0.362	0.340	0.359
Adjusted R2	0.270	0.305	0.281	0.301
Residual Std. Error (df = 67)	2.988	2.916	2.966	2.923
F Statistic (df = 6; 67)	5.509***	6.336***	5.749***	6.251***
Note:	*p<0.1; **p<0.05; ***p<0.01			

2.3. Case Study: Comparison between South Korea and Mexico

In this section, South Korea and Mexico are compared to show how (post)materialism demonstrates the divergent climate mitigation performances that other factors do not seem to explain. This section first illustrates climate performances of the two countries from 2005 to 2014 and gives an overview of industrial and political characteristics, before delineating figures of materialist-postmaterialist values. The next parts track climate change policies of each country up to 2014 and then seek to explain the effect of (post)materialist values by examining climate discourse in government documents and presidential speeches in each country.

1) Climate Change Mitigation Performance

Despite sharing similar structures of industries and politics, the two countries' CO₂ emissions and indicators of climate change differed significantly from 2005 to 2014. Throughout the period, South Korea produced an average of 11 tons of CO₂ per capita while Mexico's production was about 4 tons – South Korea emitted 2.75 times more CO₂ than Mexico. The average growth rate of CO₂ per capita by South Korea was 2.15% over the same period whereas Mexico's rate was -1.11%.



< Figure 2> CO2 Emissions by South Korea and Mexico

In terms of their overall climate change performance, South Korea's average Climate Change Performance Index (CCPI) score was 48 (0 to 100 scale) throughout the same period, whereas Mexico's score was 62. When it comes to ecosystem vitality (EV), there was not much difference between the two countries, and South Korea's performance on environmental health (EH) was much better than Mexico.

	CCPI*	EV*	EH*
Mexico	62.4	42.6	63.7
South Korea	48.2	43.7	89

*All the indicators are 0 to 100 scale

<Table 6> Environmental Indicators (average of 2005-2014)

2) Industrial and Political Structure

South Korea and Mexico have similar industrial structures as they both rely on heavy industries that consume high volumes of energy. Both countries have gone

through industrialization from the 1970s to 1990s and were seen as advanced developing countries as they joined the OECD in the mid-1990s. In 2005, South Korea's GDP was 935 billion dollars (current US\$), and it was composed of 60% service, 28% manufacturing, 38% secondary industries (construction, mining, energy resource management), and 3% agriculture and fishery while Mexico's 877 billion dollars GDP consisted of 60% service, 16% manufacturing, 33% secondary industries, 3% agriculture and fishery.³² Thus, share of heavy industries in 2005 was 66% in Korea and 49% in Mexico.

Both countries are heavily dependent on fossil fuels as shown in Table 7. South Korea's energy supply in 2000 consisted of 53% oil, 22% coal, 9% natural gas, 15% nuclear power, 1% clean energy (hydro, wind, solar, biofuels and waste), whereas Mexico's was made up of 59% oil, 5% coal, 24% natural gas, 1.42% nuclear power, 11% clean energy.³³ As an oil producing country, Mexico supplies more than half of its energy from oil and rely relatively less on coal. South Korea, on the other hand, heavily depends on energy imports and supplied about 15% of its energy from nuclear power plants in 2000. From 2005 to 2010, the proportion of oil decreased in both countries, while the proportions of coal and natural gas instead increased. Throughout the period, Mexico's share of clean energy was larger than South Korea's, but it began to decrease while South Korea's share slowly increased over the period.

Yet regarding economic growth of each country, South Korea's annual growth rate was about 3 times higher on average from 2005 to 2009 and 0.5% higher from 2010 to 2014. Thus, it is still possible that South Korea's higher rates of CO₂ emissions are partly attributed to its higher economic growth rates instead of value orientation. This aspect should be considered in the rest of this case study.

³² KOSIS. "경제활동별 국내총생산(당해년가격)(OECD)[GDP by economic sectors(Current Prices)]," www.kosis.kr, accessed on April 21st, 2021.

³³ IEA. "World Energy Balances 2020," <https://www.iea.org/subscribe-to-data-services/world-energy-balances-and-statistics>, accessed on April 21st, 2021.

Mexico	2000	2005	2010
Oil	59.26%	56.45%	52.87%
Coal	4.56%	6.73%	7.42%
Natural gas	23.54%	25.51%	30.36%
Nuclear	1.42%	1.56%	0.86%
Hydro	1.89%	1.32%	1.79%
Wind, solar	3.40%	3.52%	2.16%
Biofuels and waste	5.93%	4.92%	4.54%

South Korea	2000	2005	2010
Oil	52.64%	43.98%	38.06%
Coal	22.29%	23.61%	29.39%
Natural gas	9.04%	13.02%	15.46%
Nuclear	15.09%	18.19%	15.49%
Hydro	0.18%	0.15%	0.13%
Wind, solar	0.02%	0.02%	0.09%
Biofuels and waste	0.73%	1.02%	1.39%

<Table 7> Mexico(top) and South Korea(bottom)'s total energy supply by source in 2000, 2005, 2010

Source: IEA World Energy Balances 2020

Both countries have adopted a presidential system of government and division of powers between three branches (executive, legislature, and judiciary). Mexico has a bicameral legislature whereas South Korea adopts a unicameral system. Though both governments are regarded as democracy, South Korea tends to score a little higher in indicators of democracy than Mexico. According to the democracy score released by the Economist Intelligence Unit (EIU), the average score throughout 2006-2014 was 7 whereas South Korea's score was 8. South Korea's democracy levels in major principles of democracy (electoral, liberal, participatory, and egalitarian) by Varieties of Democracy(V-Dem) are also higher than that of Mexico by 0.1 point out of 0 to 1(low to high) scale except for the level of egalitarian

democracy (the difference is 0.4).³⁴ Additionally, the countries' Polity IV scores, which focuses on characteristics of political regimes, were both 8.³⁵

South Korea and Mexico's international stance at the UNFCCC Conference of the Parties (COP)³⁶ is quite similar due to their unique position. When the UNFCCC was signed in 1992, the countries were both classified as non-annex I countries, which are not obligated to reduce GHG emissions under the Kyoto Protocol. Yet since joining the OECD in the mid-1990s, their position as developing nations was no longer guaranteed as they began to receive pressures from developed countries to set binding targets. Thus, they created a negotiation group, called the 'Environmental Integrity Group (EIG)' with Switzerland in 2000 to respond to the international pressure as a joint group.

3) (Post)Materialist Values

There are noticeable differences in terms of (post)materialist values between South Korea and Mexico. From 2005 to 2014 on average, the South Korean sample population consisted of 31% materialists, 63% mixed, 5% postmaterialists, whereas Mexican sample population consisted of 24% materialists, 59% mixed, 14% postmaterialists. Except for the early 2000s, the proportion of postmaterialists in Mexico has been larger than that of South Korea, and the gap between the countries was the largest in the 5th wave and it became smaller on the next survey as the proportion of postmaterialists in South Korea went up.

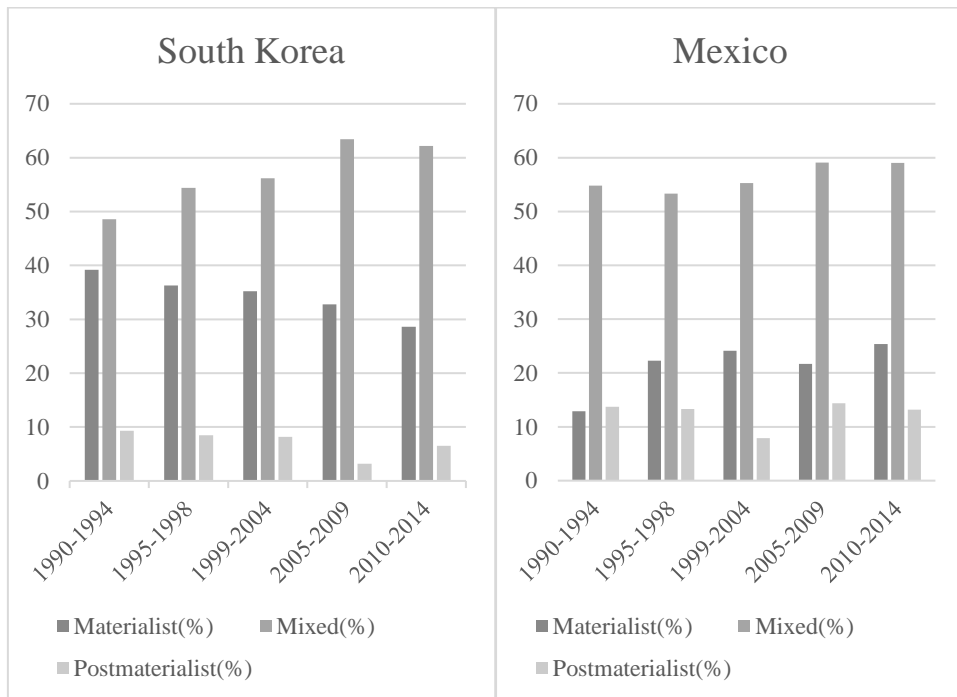
³⁴ The data is based on the period from 2005 to 2014. Michael Coppedge, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, David Altman, Michael Bernhard, M. Steven Fish, Adam Glynn, Allen Hicken, Anna Lührmann, Kyle L. Marquardt, Kelly McMann, Pamela Paxton, Daniel Pemstein, Brigitte Seim, Rachel Sigman, Svend-Erik Skaaning, Jeffrey Staton, Agnes Cornell, Lisa Gastaldi, Haakon Gjerløw, Valeriya Mechkova, Johannes von Römer, Aksel Sundtröm, Eitan Tzelgov, Luca Uberti, Yi-ting Wang, Tore Wig, and Daniel Ziblatt, "V-Dem Codebook v10" Varieties of Democracy (V-Dem) Project (2020).

³⁵ Center for Systemic Peace, "Polity5: Regime Authority Characteristics and Transition Datasets," <http://www.systemicpeace.org/polityproject.html>, accessed on April 26th, 2021.

³⁶ Conference of the Parties (COP) is a decision-making body of the United Nations Framework on Climate Change (UNFCCC) and serves as an annual summit of the parties to the Convention.

Year	Country	Materialist(%)	Mixed(%)	Postmaterialist(%)
wave2(1990-1994)	South Korea	39.2	48.6	9.3
	Mexico	12.9	54.8	13.7
wave3(1995-1998)	South Korea	36.3	54.4	8.5
	Mexico	22.3	53.3	13.3
wave4(1999-2004)	South Korea	35.2	56.2	8.2
	Mexico	24.1	55.3	7.9
wave5(2005-2009)	South Korea	32.8	63.4	3.2
	Mexico	21.7	59.1	14.4
wave6(2010-2014)	South Korea	28.6	62.2	6.5
	Mexico	25.4	59	13.2

<Table 8 > Distributions of materialists, mixed, and postmaterialists



< Figure 3> Distributions of materialists, mixed, and postmaterialists

4) Climate Change Policies

South Korea and Mexico set up entities to respond to the UNFCCC as early as late 1990s up to early 2000s. After the inauguration of President Kim Daejoong in 1998, South Korea began to formulate policies and plans that focus on

climate change.³⁷ Under Kim administration (1998-2003), South Korea joined the Kyoto Protocol in 1998, which was ratified four years later in 2002, and Ministerial Conference on the Convention on Climate Change (MCCC) was established to respond to the UNFCCC. Moreover, the first Comprehensive Action Plan for the UNFCCC(CAP-UNFCCC), which lay out projects to reduce greenhouse gas emissions was released in 1998.³⁸ The MCCC later became Committee for Responding to the Convention on Climate Change (CRCCC) in 2001 and developed the second CAP-UNFCCC a year later. Efforts to respond to the UNFCCC in Mexico took off under the administration of President Vicente Fox Quesada (2000-2006) as legal and administrative institutions such as Inter-Ministerial Commission for Climate Change and a National Strategy for Climate Change (NSCC) began to be set up.

After the Kyoto Protocol officially became effective in 2005, both countries sought to integrate efforts to reduce GHG emissions in their policies. Under President Roh Moohyun (2003-2008), South Korea released the third CAP-UNFCCC (2005 to 2007) in 2005 and its modified version a year later in response to the Kyoto Protocol. It contained 3 policy directions – building a foundation for implementing the UNFCCC, reducing GHG emissions, and adaptation. Likewise, Mexico updated its National Strategy for Climate Change (2007) and issued National Development Plan (2007), which emphasized environmental sustainability as one of its main criteria for formulating policies³⁹ and Mexico’s role as an intermediary

³⁷ Sungjin Kim, *The Politics of climate change and national responses: comparing policy actions to the Kyoto Protocol of the United Kingdom, The United States and Republic of Korea*, Ph.D Dissertation, Seoul National University, 2013, pp. 206; Kyungjun Yun and Esook Yoon, “The International Climate Change Regime and Evolution of South Korea’s Climate Change Policy,” *Journal of Environmental Policy and Administration*, Vol. 24, No. 1 (2016), pp. 84.

³⁸ Jaehoon Hwang, “기후변화협약 대응 종합대책[Comprehensive Action Plan for the UNFCCC(CAP-UNFCCC)],” *Yonhap News* (Dec. 22nd, 1998), <https://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=100&oid=001&aid=0004344182>, accessed on April 28th, 2021.

³⁹ Gustavo Sosa-Nunez and Simone Lucatello, “Analyzing Political Discourse: Mexico’s Climate Change Policy,” *L’Europe en Formation*, No. 380 (Feb 2016), pp. 45.

between developed and developing countries.⁴⁰ Moreover, the Mexican government under President Felipe Calderon (2006-2012) developed initiatives for Reducing Emissions from Deforestation and Forest Degradation (REDD+),⁴¹ and the initiatives were facilitated by environmental laws reforms.⁴²

In late 2000s, both governments strengthened their efforts to tackle climate change by publicly announcing voluntary mitigation targets in COP 15, held in Copenhagen in 2009. Mexico pledged to reduce GHG emissions by 30% in 2020 and by 50% in 2050 from the level of 2000,⁴³ while South Korea announced to reduce GHG emissions 30% below the business as usual (BAU) level by 2020.⁴⁴ South Korea under the presidency of Lee Myungbak (2008-2013) presented a new national vision, called ‘Low Carbon, Green Growth’ and released its first Five-Year Plans for Green Growth (FYPGG, 2009-2013) in 2009, which delineates a plan to adapt to climate change and improve energy independence by creating new sources of growth, improving quality of life and international standing as the main three strategies and 10 policy directives to implement the vision.⁴⁵ The vision was further consolidated through the enactment of Framework Act on Low Carbon, Green Growth in 2010 and followed by the foundation of the Greenhouse Gas Inventory and Research Center of Korea (GIR) in the same year. Moreover, the CRCCC that

⁴⁰ Presidency of the Mexican United States, “National Development Plan 2007-2012,” (Mexico City: Government of the Mexican United States), accessed 12 June 2016, as cited in Sosa-Nunez and Lucatello, 2016, pp. 81.

⁴¹ Arturo Balderas Torres, Priscila Lazaro Vargas, and Jouni Paavola, “The systemic and governmental agendas in presidential attention to climate change in Mexico 1994-2018,” *Nature Communications*, Vol. 11 (Jan. 2020), pp. 3; The World’s Carbon Markets, “Mexico: A Market Based Climate Policy Case Study,” (Jan. 2018), pp. 3.

⁴² IUCN, “Finding balance: perceptions of REDD+ in Mexico,” (Sep. 24th, 2018), <https://www.iucn.org/news/forests/201809/finding-balance-perceptions-redd-mexico>, accessed on April 20th, 2021.

⁴³ Torres, Vargas, and Paavola, 2020, pp. 75~76.

⁴⁴ Republic of Korea, “Korea’s Third National Communication under the United Nations Framework Convention on Climate Change: Low Carbon, Green Growth,” (2011), pp. 6.

⁴⁵ 녹색성장위원회[Green Growth Korea], “녹색성장 국가전략 및 5개년계획 요약본[Executive Summary of National Strategy for Green Growth and 5 Year Plan],” (2009), pp. 21, https://www.greengrowth.go.kr/menu001/sub002/GRG_001_202.do, accessed on May 1st, 2021.

used to be under ordinance of Prime Minister was incorporated into the Presidential Committee on Green Growth (PCGG) in 2009.

Likewise, Mexico's climate change policies took off under President Felipe Calderon as the administration regarded them as a cornerstone of Mexico's foreign policy.⁴⁶ For instance, Mexico organized several dialogues before hosting COP16 at Cancun to smoothen the process of reaching agreements.⁴⁷ As a result of the COP 16, Cancun Agreements, which establish the Green Climate Fund along with a new technology mechanism and adaptation framework were made.⁴⁸ Mexico was also one of the very first countries to adopt a general law on Climate Change (GLCC), which was issued in 2012 and it further consolidated voluntary mitigation targets that were announced at COP15 and were followed by the establishment of policy instruments, including the National Climate Change System, Special Program for Climate Change, and related local level programs.⁴⁹

Under President Enrique Pena Nieto (2012-2018), Mexico's proactive stance on climate change has relatively weakened. According to Torres *et al*, the issue of "climate change was deemphasized and subordinated to strategies promoting green growth and low carbon development."⁵⁰ Nonetheless, climate policies continued under the framework of the GLCC. A national strategy for climate change was updated in 2013 and it emphasized economic instruments as a way of building climate policies.⁵¹ President Nieto also introduced plans to impose carbon tax on production of fossil fuels in 2012(enforced a year later) and a voluntary mechanism (MEXICO2) to trade carbon credits. Mexico further sought to cooperate with its

⁴⁶ Sosa-Nunez and Lucatello, 2016, pp. 76.

⁴⁷ Sosa-Nunez and Lucatello, 2016, pp. 76.

⁴⁸ UNFCCC, "Cancun Agreements," <https://unfccc.int/process/conferences/pastconferences/cancun-climate-change-conference-november-2010/statements-and-resources/Agreements>, accessed on April 20th, 2021.

⁴⁹ Sosa-Nunez and Lucatello, 2016, pp. 81.

⁵⁰ Torres, Vargas, and Paavola, 2020, pp. 4.

⁵¹ The World's carbon markets, 2018, pp. 3

neighbouring countries, the United States and Canada, as they had announced a goal to generate 50% of electricity in North America from clean energy by 2025.⁵²

5) Discourse of Climate Change

This section demonstrates whether and how (post)materialist values affect climate change mitigation in South Korea and Mexico in the late 2000s by examining the main discourse of climate policies under the administration of President Lee and President Calderon. The two presidents presided over the period when Kyoto mechanisms became effective and proactively pushed climate policies.

Discourse consists of language of what is appropriate and logical way of action thus, revealing the way in which different claims of rationality and standpoints are presented as ‘truth.’⁵³ As mentioned in chapter 1, postmaterialists tend to prioritize self-expression, personal freedom, and quality of life over physical security and economic prosperity and vice versa for materialists. Therefore, it is expected that Mexican government uses the language that either emphasizes the postmaterialist values, whereas South Korean government is likely to focus more on economic and physical stability in its address of climate change.

Admittedly, climate change has recently become as an issue that threatens humanity and many governments around the world are conflating senses of security and economic development in their pledges of achieving carbon neutrality by 2050. But the issue was not as mainstream in mid 2000s, and the concept of sustainable development, or also known as ecological modernization, was not as universal especially for developing nations. The Kyoto mechanism epitomizes the distinction between the developed and developing nations as it differentiates commitments

⁵² Danielle Ola, “US, Canada & Mexico joint pledge to source 50% of electricity from clean energy by 2025,” (June 28th, 2016), <https://www.pv-tech.org/us-canada-mexico-joint-pledge-to-source-50-of-electricity-from-clean-energy/>, accessed on April 20th, 2021.

⁵³ Gard Lindseth, *Political Discourse and Climate Change: The Challenge of Reconciling Scale of Impact with Level of Governance*, Ph.D. Dissertation, Norwegian University of Science and Technology, 2006, pp. 19

based on the level of development. As non-Annex I countries, South Korea and Mexico did not have binding reduction targets yet they both saw opportunities of raising their international stature by using their unique position as an intermediary between the developed and developing nations. This is evident in their policies from the late 2000s.

Despite having similar rationale, the discourse of climate change the two countries used differed with one another. South Korea's climate policies, represented by 'Low Carbon, Green Growth' strategy under Lee administration, shows prevalence of materialist values. For instance, in his speech at commemoration of the 60th anniversary of National Foundation Day, President Lee announced the new national vision and then defined green growth as "sustainable growth that reduces greenhouse gases and pollution" and also as "a new development paradigm that creates a new engine for growth and jobs through green technologies and clean energy."⁵⁴ He then continued by stating "...Green technologies will cure the problem of 'jobless growth' by creating jobs. Renewable energy industry will make even more jobs than traditional industries. The gap between the rich and the poor during the IT era will be narrowed down in the era of green growth."⁵⁵ It is apparent from the speech that green growth is emphasized for its potential for securing more employment and wealth rather than for positive effects of reducing CO₂.

On the other hand, Mexican President Felipe Calderon's address at the United Nations General Assembly in 2012 shows a judgement based on postmaterialist values as he stated:

In Mexico, we are experiencing a false debate which took place here in the UN, which takes place all the international fora. The debate seems to be either we grow, or we tackle climate change. We either end poverty or we put an end to

⁵⁴ 『이명박 대통령 연설문집. 1』[The Speeches of President Myungbak Lee], (서울: 대통령실, 2009), pp. 369~370.

⁵⁵ 『이명박 대통령 연설문집. 1』[The Speeches of President Myungbak Lee], 2009, pp. 370.

global warming...You can't do both things at the same time and yes you can. I would say we must tackle both at the same time. We have to overcome this false dilemma that exists between protecting the environment or promoting economic development, between fighting poverty or fighting climate change. In Mexico, we are doing both things at the same time.⁵⁶

The underlying assumption behind his claim is that climate change and economic development should go hand in hand and that both things are important, and neither should come forth than another. His other remark at Clinton Global Initiative Meetings further indicate that he does not necessarily prioritize economic stability by stating as following:

My concern is that the economic problems we are looking around are so big and there is very few attention to the problem and the challenge of climate change and the COP17. And we need to raise leadership and public opinion to mobilize... in order to promote another step, bold step in favour of a battle against climate change.⁵⁷

It is observable from the remark that President Calderon is concerned about climate change as much, or even more than economic issues. Therefore, Mexico under his administration implemented policies that did not necessarily put economic gains before climate mitigation. And this proactive stance was arguably derived from postmaterialist value orientation, in contrast to more materialistic South Korea.

⁵⁶ C-span, "Mexican president Felipe Calderon United Nations General Assembly Address," (Sep. 26, 2012), <https://www.c-span.org/video/?308405-105/mexican-president-felipe-calderon-united-nations-general-assembly-address>, accessed on May 6th, 2021.

⁵⁷ Presidencia Felipe Calderon Hinojosa, "Sesión inaugural de la Clinton Global Initiative 2011," <https://www.youtube.com/watch?v=B5N7kzTCmPc>, accessed on May 6th, 2021.

Chapter 3 Perception as World Citizens

3.1. Model 2: Perception as World Citizens

$$(3) y = \beta_0 + \beta_1 \text{world_a} + \beta_2 \text{GDPC} + \beta_3 \text{GDPG} + \beta_4 \text{GOVE} + \varepsilon$$

$$(4) y = \beta_0 + \beta_1 \text{world_a} + \beta_2 \text{polity_Democ} + \beta_3 \text{world_a} * \text{polity_Democ} + \beta_4 \text{GDPC} + \beta_5 \text{GDPG} + \beta_6 \text{GOVE} + \varepsilon$$

3.2. Results

Regressions were run for a sample of countries for which all data are available. The results from Table 9 show that self-perception as a world citizen do not have significant effect except for ecosystem vitality (EV). Although the effect on CO2 is not significant at 0.05 level, the effects are still constant with the hypothesis. On the other hand, the effect of CO2T is positive in contrast to the H3. Possible reasons for the opposite signs might be countries with more people identifying as world citizens do not necessarily reduce CO2 on annual basis yet tend to have lower levels of CO2 at any given point in time. Overall, the result shows that countries with higher level of perception as a world citizen are better at preserving ecosystem and natural resources but not at reducing CO2 emissions.

<Table 9> Effects of perception as world citizens

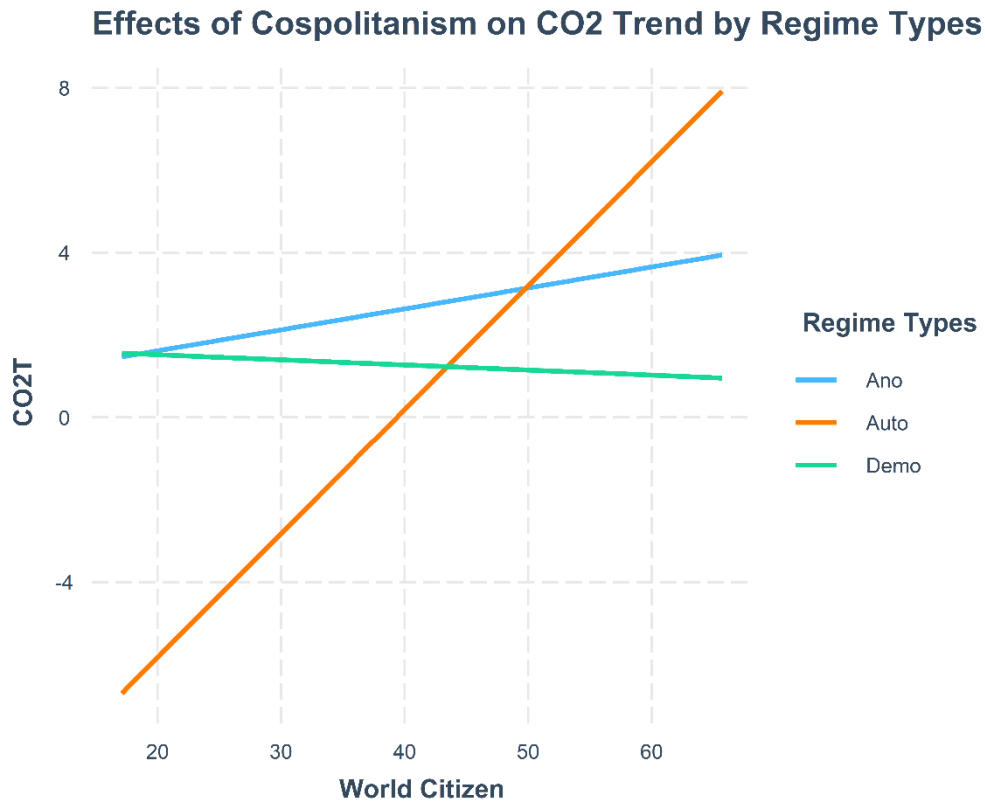
	CO2 (1)	CO2T (2)	EV (3)	CCPI (4)
world_a	-0.139* (0.074)	0.063* (0.035)	0.324** (0.127)	-0.116 (0.104)
GDPG	0.0003*** (0.0001)	-0.0001** (0.00003)	-0.00001 (0.0001)	0.00001 (0.0001)
GDPG	0.520* (0.300)	0.580*** (0.142)	-0.080 (0.506)	-0.455 (0.515)
GOVE	-0.167 (1.420)	0.135 (0.675)	2.509 (2.401)	1.053 (2.228)
Constant	5.691 (3.794)	-2.913 (1.800)	30.272*** (6.386)	52.446*** (4.783)
Observations	73	74	72	38
R2	0.403	0.341	0.218	0.093
Adjusted R2	0.368	0.303	0.171	-0.017
Residual Std. Error	6.109 (df = 68)	2.903 (df = 69)	10.230 (df = 67)	5.948 (df = 33)
F Statistic	11.495*** (df = 4; 68)	8.927*** (df = 4; 69)	4.659*** (df = 4; 67)	0.841 (df = 4; 33)
=====				
Note:	*p<0.1; **p<0.05; ***p<0.01			

Nonetheless, Table 10 shows that interaction effects of political regime types on the relationship between perception as a world citizen and performance of climate change are only significant for CO2 trend. A possible reason for the partial significance might be because CO2T that captures changes in CO2 reductions reflect the differences caused by regime types where democracies tend to implement policies at request of their cosmopolitan constituents, contrary to autocracies. Emission levels, on the other hand, are affected by the existing proportions and behaviour of cosmopolitan constituents that might not significantly differ due to regime types.

According to the results, a unit increase of perception as a world citizen in democratic regimes lowers CO2 trend by 0.002, while in authoritarian regimes, the effect of increasing the trend is further amplified by 0.305. As shown in Figure 4, the upward trend of CO2T in autocracies could be because the regime tends to satisfy the needs of a small (possibly cosmopolitan) group of elites by providing private benefits that improve nearby environment, instead of public goods intended to mitigate climate change.

<Table 10> Interaction Effects of Regime Types

Dependent variable:				
	C02		C02T	
	(1)	(2)	(3)	(4)
world_a	-0.203* (0.111)	-0.061 (0.081)	0.150*** (0.050)	0.004 (0.037)
polity_Demo	-6.078 (6.475)		5.105* (2.927)	
polity_Auto		18.213** (7.615)		-14.070*** (3.423)
GDPG	0.0002*** (0.0001)	0.0002*** (0.0001)	-0.00005 (0.00003)	-0.00001 (0.00003)
GDPG	0.473 (0.330)	-0.035 (0.341)	0.535*** (0.149)	0.872*** (0.153)
GOVE	0.186 (1.645)	0.878 (1.461)	0.306 (0.743)	-0.270 (0.658)
world_a:polity_Demo	0.137 (0.150)		-0.152** (0.068)	
world_a:polity_Auto		-0.299 (0.189)		0.305*** (0.085)
Constant	8.812 (5.326)	4.985 (3.801)	-5.548** (2.408)	-1.946 (1.710)
Observations	70	70	71	71
R2	0.412	0.485	0.396	0.476
Adjusted R2	0.356	0.436	0.340	0.426
Residual Std. Error	6.294 (df = 63)	5.892 (df = 63)	2.847 (df = 64)	2.654 (df = 64)
F Statistic (df = 6; 64)	7.369*** (df = 6; 63)	9.891*** (df = 6; 63)	7.006*** (df = 6; 64)	9.670***
Note: *p<0.1; **p<0.05; ***p<0.01				



< Figure 4> Interaction Effects of Polity on CO2T

Mixed results from hypothesis (3) and (4) had me question other potential variables that could moderate the effect of world citizen on the performance of climate change mitigation. While cosmopolitanism has become somewhat universal due to the increased connectivity through globalization, it is likely that behaviour associated cosmopolitan orientation turn out differently depending on the level of industrial development because cosmopolitans in industrialized nations are likely to have more resources and opportunities to engage in sustainable practices than those in developing countries. To find out the moderating effect of industrialization, multiple regression was conducted by classifying countries into three categories (industrialized economies, emerging industrial economies and developing

economies)⁵⁸ by using the grouping by the United Nations Industrial Development Organization (UNDIO). Columns (1) and (2) from Table 11 respectively show that the negative effect of world citizen become positive in developing countries, thus increasing the level CO2. On the other hand, the negative effect of perception as world citizens is further amplified in industrialized economies, thus reducing even more CO2. Overall, the results show that the moderating effect of industrialization level is significant while political regime types are held constant.

⁵⁸ The classification follows the grouping by the United Nations Industrial Development Organization (UNDIO). I categorized 'Other developing economies' and 'Least developed countries' into one category called 'developing economies.'

<Table 11> Interaction Effects of level of industrialization

Dependent variable:		
	CO2	
	(1)	(2)
world_a	-0.271*** (0.096)	-0.020 (0.092)
economy2_Developing	-15.189** (6.220)	-1.824 (2.069)
economy2_Industrialized	6.418** (2.536)	22.609*** (6.696)
polity2	-0.352** (0.142)	-0.347** (0.140)
GVE	2.278 (1.525)	2.456 (1.500)
world_a:economy2_Developing	0.316** (0.157)	
world_a:economy2_Industrialized		-0.371** (0.146)
Constant	18.378*** (4.255)	7.511* (4.163)
Observations	70	70
R2	0.429	0.448
Adjusted R2	0.375	0.396
Residual Std. Error (df = 63)	6.205	6.100
F Statistic (df = 6; 63)	7.886***	8.528***

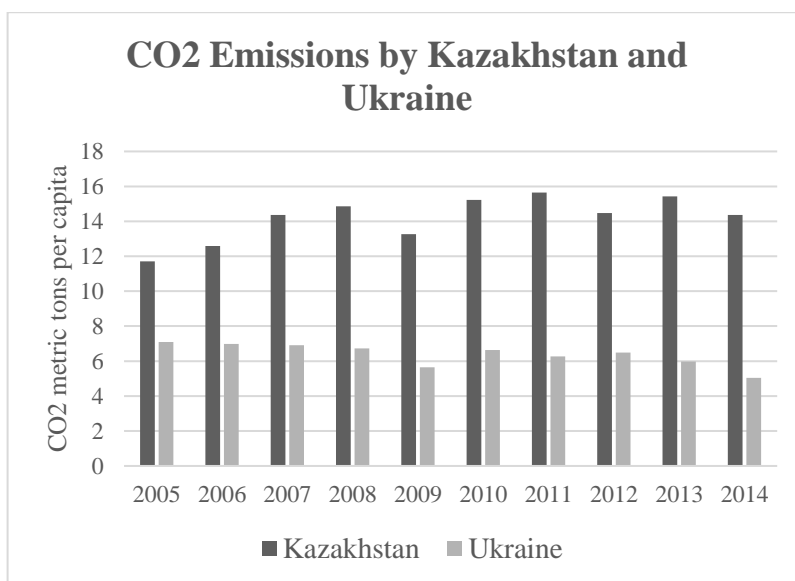
Note: *p<0.1; **p<0.05; ***p<0.01

3.3. Case Study: Ukraine and Kazakhstan

In this section, Ukraine and Kazakhstan are compared to demonstrate the interplay of political regime types in the relationship between the world citizen variable and annual trend of CO₂ (CO₂T). The two countries were chosen because they had similar cosmopolitan orientation and are both economies in transition from planned economy as former Soviet republics. This section first illustrates climate performances of the two countries from 2005 to 2014 and gives an overview of industrial and political characteristics, cosmopolitan orientation, and materialist-postmaterialist values in each country. The next parts track climate change policies of the two countries up to 2014 and then seek to explain the moderating effect of regime types by examining the activities of civil society and their interaction with the government.

1) Climate Change Mitigation Performance

Throughout 2005 to 2014, the annual trend of CO₂ in Ukraine was an average of -3.4% while Kazakhstan's rate was about 2.8%. The average amount of CO₂ per capita by Ukraine was 14 tons over the same period whereas Kazakhstan's was 6 tons.



< Figure 5> CO2 Emissions by Kazakhstan and Ukraine (2005-2014)

When it comes to their overall climate change performance represented by CCPI and EV, Ukraine scored higher than Kazakhstan throughout the same period of 2005-2014 as following:

Country	CCPI*	EV*	EH*
Kazakhstan	35.3	22.2	64.9
Ukraine	45.8	34.1	72.7

*All the indicators are 0 to 100 scale

<Table 12> Environmental Indicators of Kazakhstan and Ukraine (average of 2005-2014)

2) Industrial and Political Characteristics

Ukraine and Kazakhstan both gained independence in the aftermath of the dissolution of the Soviet Union in 1991 and since their mitigation efforts were influenced by the remnants of energy-intensive planned economies. Recently they are regarded as emerging industrial economies according to the UNIDO. In 2005,

Ukraine's GDP (current US\$) was 86 billion dollars and roughly consisted of 10% agriculture, 30% industry (17% manufacturing), and 60% service⁵⁹ whereas, Kazakhstan's 57 billion dollars GDP⁶⁰ consisted of 6% agriculture, 12% manufacturing, 30% secondary industries, and 52% service.⁶¹ Both countries supply most of their energy from fossil fuels. Ukraine's energy supply in 2000 consisted of 29% coal, 46% natural gas, 9% oil, 15% nuclear, 1% clean energy (hydro, wind, solar, biofuels and waste), whereas Kazakhstan's was made up of 56% coal, 19% natural gas, 24% oil, 2% clean energy.⁶²

It is noticeable that Kazakhstan supply more than half of its energy from coal despite being an oil producing country. From 2005 to 2010, the energy mix of Ukraine had not changed much, while Ukraine's share of oil is being replaced by natural gas. Clean energy takes about 1-2% of total energy in both countries and the figures in Ukraine show an upward trend, while Kazakhstan's share had decreased.⁶³

Ukraine	2000	2005	2010
Coal	28.74%	26.30%	28.80%
Natural gas	46.42%	46.31%	41.61%
Nuclear	15.02%	16.31%	17.61%
Hydro	0.72%	0.75%	0.85%
Biofuels and waste	0.20%	0.18%	1.20%
Oil	8.90%	10.14%	9.92%
Wind, solar	0.00%	0.00%	0.00%

⁵⁹ 황지영[Jiyoung Hwang], 김하민[Hamin Kim], “우크라이나의 주요 산업: 자동차 및 자동차부품 산업, IT 산업, 항공우주 산업[Major Industries in Ukraine: Automobile and Auto parts Industry, IT Industry, Aerospace Industry],” KIEP-KOTRA (2009), pp. 18

⁶⁰ World Development Indicators, The World Bank, <https://datacatalog.worldbank.org/dataset/world-development-indicators>, accessed on May 8th, 2021.

⁶¹ 황지영[Jiyoung Hwang], 이철원[Chulwon Lee], 최진형[Jinhyung Choi], “카자흐스탄의 주요 산업: 석유, IT, 건축자재, 의약[Major Industries in Kazakhstan: Petroleum, IT, Building Materials, and Medicine],” KIEP-KOTRA(2018), pp. 20.

⁶² IEA, “World Energy Balances 2020,” <https://www.iea.org/subscribe-to-data-services/world-energy-balances-and-statistics>, accessed on May 7th, 2021.

⁶³ IEA, “World Energy Balances 2020.”

Kazakhstan	2000	2005	2010
Coal	55.80%	55.99%	50.00%
Natural gas	18.56%	24.49%	32.33%
Nuclear	0.00%	0.00%	0.00%
Hydro	1.83%	1.33%	1.00%
Biofuels and waste	0.21%	0.02%	0.07%
Oil	23.61%	18.18%	16.60%
Wind, solar	0.00%	0.00%	0.00%

<Table 13> Ukraine(top) and Kazakhstan(bottom)’s total energy supply by
source in 2000, 2005, 2010

Source: IEA World Energy Balances 2020

Both countries have a presidential system of government yet different regime types. Since the Orange Revolution in 2004, Ukraine’s legislature gained relatively more power⁶⁴ and was considered as democracy according to the average score released by Polity IV Project and Freedom House, and ‘flawed democracy’ by the EIU throughout 2005 to 2014. The same sources classified Kazakhstan as an authoritarian regime due to the prolonged ruling of former President Nursultan Nazarbayev. Under the UNFCCC, Ukraine is grouped as an Annex I country, while Kazakhstan is part of the non-Annex I parties.

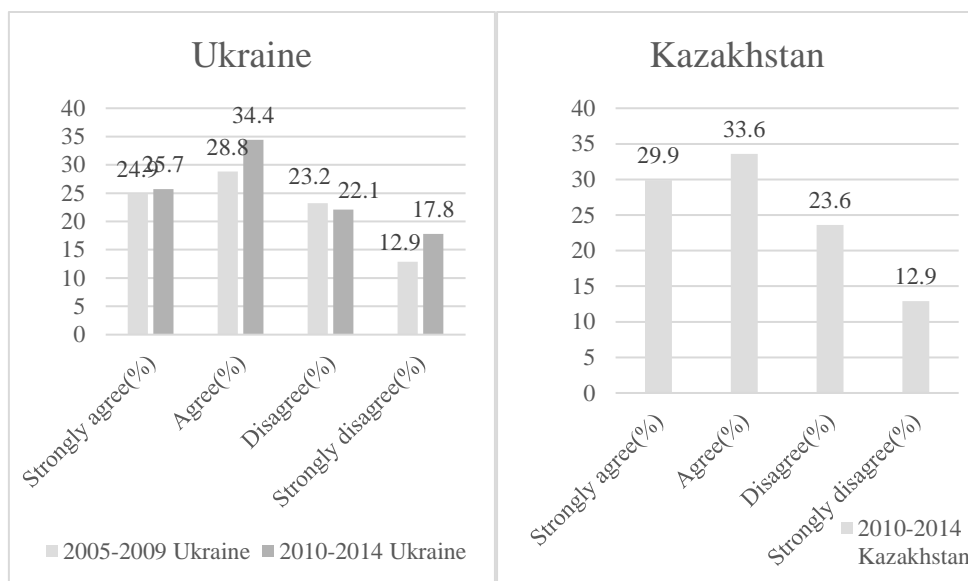
3) Ideational Variables

Ukraine and Kazakhstan have similar figures of cosmopolitan orientation according to the WVS conducted from 2005 to 2014. 64% of the sample population in Kazakhstan perceived themselves as a world citizen in early 2010s,⁶⁵ and an average 57% of Ukrainians identified themselves as a world citizen in World Values

⁶⁴ European Bank for Reconstruction and Development, “Special Report on Climate Change: The Low Carbon Transition,” (2011), www.ebrd.com, accessed on May 1st, 2021, pp. 66.

⁶⁵ Kazakhstan’s data for wave5 (2005-2009) is not available.

Survey conducted throughout the period 2005-2014.⁶⁶ When it comes to (post)materialist values, the Ukrainian sample population consisted of 40% materialists, 54% mixed, 4% postmaterialists on average, while the Kazak sample population consisted of 53% materialists, 44% mixed, 3% postmaterialists in the early 2010s.



<Figure 6> Distribution of Perception as world citizens

4) Climate Change Policies

Ukraine's climate policies have largely been shaped by the Kyoto Protocol, which was ratified in 2004.⁶⁷ As an Annex I country, Ukraine had pledged to limit its emissions to 1990s level for the first commitment period of 2008 to 2012. In 2005, the Ukrainian government adopted 'National Plan of Measures on Fulfilment of Provisions of Kyoto Protocol to the UNFCCC' to respond to the Kyoto Protocol.⁶⁸

⁶⁶ Inglehart *et al*, 2014.

⁶⁷ Anna Korppoo and Olga Gassan-Zade, "Lessons from JI and GIS for post-2012 carbon finance mechanisms in Russia and Ukraine," *Climate Policy*, Vol. 14, No. 2 (2012), pp. 228.

⁶⁸ Ministry of Environmental Protection of Ukraine, "Ukraine's Report on Demonstrable Progress Under the Kyoto Protocol," (2006), pp. 4, <https://unfccc.int/resource/docs/dpr/ukr1.pdf>, accessed on May 12th, 2021.

Some of the plans included establishing an inventory system for GHGs and an infrastructure to manage Joint Implementation (JI) projects.⁶⁹

Ukraine actively hosted projects derived from the Kyoto mechanisms, including the JI and Green Investment Scheme (GIS) because they provided the country with opportunities to receive finance and technologies from other developed economies.⁷⁰ Having restructured the economy since the independence, Ukraine's emissions were already 59% below the 1990s level in 2010 and were able to sell the surplus amount (Assigned Amount Units, AAU), which was essentially a permit to emit 1 metric tons of CO₂ per unit, to other countries.⁷¹ Ukraine thus actively hosted GIS and JI projects. GIS allowed the host country to receive funds for projects, designed to reduce GHG emissions, in return for sales of AAU.⁷² JI allowed countries that have binding targets (Annex B Party) to earn emission reduction units (ERUs) which can be counted for meeting their own target for reducing emissions or conducting projects for emission removal in another Annex B Party.⁷³ According to National Ecological investment agency of Ukraine, half of the ERUs that were issued around the world up to 2010 were from Ukraine⁷⁴ and by 2015, Ukraine ranked 1st in the number of ERUs issued.⁷⁵ Other climate policies from the late 2000s to early 2010s included policies to promote renewable energy and energy efficiency in

⁶⁹ Ministry of Environmental Protection of Ukraine, 2006, pp. 4.

⁷⁰ UNFCCC, "Mechanisms under the Kyoto Protocol," <https://unfccc.int/process/the-kyoto-protocol/mechanisms#:~:text=The%20Kyoto%20mechanisms%3A&text=Help%20countries%20with%20Kyoto%20commitments,contribute%20to%20emission%20reduction%20efforts>, accessed on May 4th, 2021.

⁷¹ Korppoo and Gassan-Zade, 2012, pp. 229.

⁷² National Fund for Environmental Protection and Water Management, "Green Investment Scheme," <http://nfosigw.gov.pl/en/priority-programmes/green-investment-scheme/>, accessed on May 9th, 2021.

⁷³ UNFCCC, "Joint implementation," <https://unfccc.int/process/the-kyoto-protocol/mechanisms/joint-implementation>, accessed on May 4th, 2021.

⁷⁴ National Environmental Investment Agency of Ukraine, "Joint Implementation Projects in Ukraine," (2010), https://seors.unfccc.int/applications/seors/attachments/get_attachment?code=ACUB04NLQTTSRB902QX9874HM4YH5ZKX, accessed on May 9th, 2021.

⁷⁵ UNFCCC, "Emission Reduction Units (ERUs) issued," (2016), https://ji.unfccc.int/statistics/2015/ERU_Issuance_2015_10_15_1200.pdf, accessed on May 9th, 2021.

late 2000s.⁷⁶ The government introduced feed-in tariff (Green Tariffs) policy for renewable energy in 2009⁷⁷ and reforestation program containing targets for carbon capture in 2010.⁷⁸ Ukraine has also imposed a carbon tax on industry, energy and building sectors beginning from 2011.⁷⁹

Unlike Ukraine, Kazakhstan was unable to take advantages from the Kyoto mechanisms due to its unique position under the protocol. Despite being classified as a non-Annex I country under the UNFCCC, Kazakhstan became an Annex I party under the Kyoto Protocol in 2000 by announcing its intention to take voluntary commitment, as specified by Article 4.2.⁸⁰ Yet the protocol only allowed Annex B countries to engage in JI projects and International Emission Trading scheme and required a status of non-Annex for being able to host CDM projects. Thus, Kazakhstan initially had tried to become a party to Annex I under the UNFCCC from 1999 by proposing an amendment but failed.⁸¹ And 10 years later, it sought to amend Annex B of the Kyoto Protocol to be listed as Annex B, yet the attempt was unsuccessful until the entry of the Doha Amendment in 2012.

Having signed the Kyoto Protocol in 1999, the Kazakh government established an Inter-Agency Commission on Ratification of the Kyoto Protocol that consisted of members from nine ministries in 2000, and Climate Change Coordination Center served as a working group of the commission.⁸² Although Kazakhstan formally announced its target of reducing 100% of its emissions from the 1992 level for the first commitment period in 2008,⁸³ climate policies at domestic

⁷⁶ Ministry of Environmental Protection of Ukraine, 2006, pp. 18.

⁷⁷ Liv Arntzen Løchen, “Small hydro in Ukraine: to invest or not to invest?” FNI Report 12 (2011), pp. ii

⁷⁸ European Bank for Reconstruction and Development, 2011, pp. 69.

⁷⁹ Climate Action Tracker, “Ukraine Current Policy Projections,” <https://climateactiontracker.org/countries/ukraine/current-policy-projections/>, accessed on May 9th, 2021.

⁸⁰ Climate Focus, “Option Review for Kazakhstan to Participate in the International Carbon Market,” (2010), pp. 22.

⁸¹ Theresa Sabonis-Helf, “Catching air? Climate change policy in Russia, Ukraine and Kazakhstan,” *Climate Policy*, Vol. 3, No. 2 (2003), pp. 166.

⁸² Sabonis-Helf, 2003, pp. 168.

⁸³ UNFCCC, FCCC/CP/2008/5 (November 25th, 2008).

level began to be presented in early 2010s after the ratification of the protocol in 2009. For instance, Development Strategy of Kazakhstan 2050, presented by President Nazarbayev in 2012, laid out policies to introduce low carbon green economy by mentioning the importance of green economy for sustainable growth.⁸⁴ Furthermore, the strategy included efficient management of energy and natural resources, and renewable energy.⁸⁵ Kazakhstan also proposed an initiative called ‘Green Bridge Partnership’ that promotes international cooperation in capacity building for green growth in Europe, Asia-Pacific region in 2010,⁸⁶ and it officially began since approval by the UN Economic and Social Commission for Asia and the Pacific and the UN Economic Commission for Europe.⁸⁷ The initiative was accompanied by the presentation of Concept of transfer to the Green Economy and Action Plan to Implement the Concept by the decree of the president in 2013.⁸⁸

5) Moderating Effect of Regime Types

Regime types will influence the effect of cosmopolitan orientation on the trend of CO₂ by serving as a mechanism that shapes different political actors’ attempts to influence policymaking. In democratic system, popular concerns and priorities are expressed and adopted into the process of policymaking, whereas the head of the state and small groups of elites control policymaking in authoritarian system. Though different actors affect the process of policymaking, when it comes to cosmopolitan orientation exerting influence on the CO₂ trend, the two main actors of importance are the executive and the civil society because the effects of

⁸⁴ Ji-eon Lee, “Study on Kazakhstan’s Green Growth Policy: Focusing on the ‘Kazakhstan 2050 Strategy and Renewable Energy Policy,” *The Journal of Eurasian Studies*, Vol. 12, No. 4 (Dec 2015) pp. 149.

⁸⁵ Lee, 2015, pp. 150.

⁸⁶ Lee, 2015, pp. 151.

⁸⁷ Green Academy, “Green Bridge Partnership Program Discussed in Astana,” <https://green-academy.kz/en/green-bridge-partnership-program-discussed-in-astana/>, accessed on May 11th, 2021; Ji-eon Lee, 2015, pp. 151.

⁸⁸ World Bank, “Kazakhstan Nationwide Assessment of Climate-Change Related Risks and Formulation of Mitigation Strategy: Policy and Institutional Directions for Bolstering Climate Resilience in the Agriculture, Forestry and Energy Sectors,” (2015), pp. 2, <https://openknowledge.worldbank.org/handle/10986/22488>.

cosmopolitan orientation are most likely to arise through the domestic constituents who pressure the government to take actions. Thus, this paper will focus on comparing how environmental NGOs in Ukraine and Kazakhstan operate and channel their opinions under the political space bounded by the state.

Ukraine's civil society, including environmental NGOs have emerged since independence in 1991⁸⁹ and they have served as channels that raise awareness on the issue of climate change and advocate the need to take mitigation measures.⁹⁰ In the early 2000s, the NGOs working on climate change were largely divided into those, such as Arena-Eco and the Ukrainian Society for Sustainable Development, that presses the government to meet commitments under the UNFCCC and to build capacities for GHG mitigation, and more radical groups such as NGO Network on Climate Change, which protests the country's endorsement of market-driven Kyoto mechanisms.⁹¹

Several studies show that NGOs have been able to influence the process of policymaking. Activities of the NGO Network, for example, was very active in their attempts to affect climate policies. Their activism is evident in their proposal of adding 6 representatives of the Network to the working groups that support the executive national organization responding to the UNFCCC, Interministerial Commission.⁹² Minister of Environment and Natural Resources then, Serhiy Kurkin, approved the proposal, thus allowing NGOs more access to the policymaking.⁹³ Representatives of the Network also showed up at COP6 to dissuade the Ukrainian delegations from joining the Umbrella Group.⁹⁴ The Ministry also has held Public Council, which was an initiative suggested by an environmental NGOs in the first

⁸⁹ World Bank, "Ukraine Country Environmental Analysis,"

<https://openknowledge.worldbank.org/handle/10986/24971>, (2016), pp. 1.

⁹⁰ European Bank for Reconstruction and Development, 2011, pp. 67; Scott D. Orr, "Ethnic Identity and Civil Society in Latvia, Poland and Ukraine: The Case of Environmental NGOs," *Ethnopolitics*, Vol. 11, No.2 (2012), pp. 171.

⁹¹ Sabonis-Helf, 2003, pp. 164.

⁹² Sabonis-Helf, 2003, pp. 164-165.

⁹³ Sabonis-Helf, 2003, pp. 165.

⁹⁴ Sabonis-Helf, 2003, pp. 165.

place, to provide a platform for NGOs' participation at governance and for informing the public of the policy process.⁹⁵ Other environmental NGOs have also participated in drafting legislation and have been hired by local governments to conduct environmental impact assessments.⁹⁶ After the Orange Revolution, political power of civil organizations increased and they have been largely free from political meddling and enjoyed pluralistic media.⁹⁷ As of 2009, there were about 18,000 NGOs despite the arduous process of NGO registration and the absence of tax benefits for donation.⁹⁸

In the case of an authoritarian regime such as Kazakhstan, for cosmopolitan orientations to take effect, it is likely that the leadership plays more significant role than the civil society because the authoritarian regime controls the very channels the constituents have access for political bargaining. Under the President Nazarbayev who stayed in power for almost 30 years, the country was ruled by the central government "based on patronage and closed factional royalties" and the appointed officials.⁹⁹ Kazakhstan's political system is thus characterized as corporatist where "the constituent units are limited in number, compulsory, non-competitive, hierarchically ordered, and are granted 'representational monopoly' by the state."¹⁰⁰

The participation of Kazakh civil society at the process of policymaking were highly limited compared to Ukraine up to early 2010s despite some progress over the years. The civic movement, which had been built around the issue of testing nuclear weapons as early as 1989, was hindered throughout the decade due to

⁹⁵ Orr, 2012, pp. 173.

⁹⁶ Orr, 2012, pp. 173.

⁹⁷ European Bank for Reconstruction and Development, 2011, pp. 67

⁹⁸ Sarah D. Phillips, "Civil Society and Disability Rights in Post-Soviet Ukraine: NGOs and Prospects for Change," *Indiana Journal of Global Legal Studies*, Vol. 16, No. 1 (2009), pp. 278, pp. 282

⁹⁹ Sally N. Cummings, *Kazakhstan: Centre-Periphery Relations*, (London: The Royal Institute of International Affairs, 2000), pp. 28, as cited in Dennis Soltys, "Challenges to the Institutionalisation of Environmental NGOs in Kazakhstan's Corporatist Policy Arena," *Journal of Contemporary Asia*, Vol. 44, No. 2 (2014), pp. 345.

¹⁰⁰ P. Schmitter and G. Lehmbruch, *Trends towards Corporatist Intermediation*, (London: SAGE, 1979), pp. 13, as cited in Soltys, 2014, pp. 345.

measures that suppress political opposition, the constitutional ban on state funding for civic organizations and the high costs of registration.¹⁰¹ Yet from the early 2000s, the government began to lift the restrictive measures by legalizing funding for civic organizations and increasing the budget for NGO projects throughout the years.¹⁰²

Despite the revisions, activist groups nonetheless suffered from the lack of accountability in the process of winning contracts for social projects because the state officials tended to favour government-organized NGOs (GONGOs), some of whom were created just to receive foreign funding.¹⁰³ Most of all, NGOs were not treated as an equal political force, but rather as “junior partners” in local service provision.¹⁰⁴ This treatment is present in the process of holding Civic Forum, which began by the initiative of the President from 2003. The forum was participated by NGO representatives who were selected “under the aegis” of state and provincial officials and hosted by the state.¹⁰⁵ These practices show that Kazakh civil society could not have had much impact on the country’s CO2 mitigation efforts.

While Kazakhstan’s active climate policies coordinated by the executive for the period of 2005-2014 could possibly indicate cosmopolitan leadership that is concerned about climate change, its CO2 trend, which is higher than that of Ukraine, nonetheless shows that authoritarian regimes are less likely to provide environmental public goods. According to selectorate theory, public goods, provided by democracies and autocracies, vary due to the differences in the size of the coalition required to stay in power.¹⁰⁶ Autocracies tend to have smaller winning coalitions than democracies, thus maintaining the coalition through provision of private goods

¹⁰¹ Soltys, 2014, pp. 348.

¹⁰² Soltys, 2014, pp. 353

¹⁰³ Soltys, 2014, pp. 352, pp. 355

¹⁰⁴ Colin Knox and Sholpan Yessimova, “State-Society Relations: NGOs in Kazakhstan,” *Journal of Civil Society*, Vol. 11, No. 3 (2015), pp. 312

¹⁰⁵ A. Ladin, “Kazakhstan: Vstrechalis’ NPO Almaty,” accessed on November 2, 2009. <http://www.seu.ru/members/ucs/eco-hr/1149.htm>, as cited in Soltys, 2014, pp. 303.

¹⁰⁶ Bruce Bueno de Mesquita, Alastair Smith, Randolph M. Siverson, and James D. Morrow, *The Logic of Political Survival*, (Cambridge: MIT Press, 2003), as cited in Cao and Ward, 2015, pp. 265.

are less costly than public goods.¹⁰⁷ Based on these hypotheses, the government's environmental policies are likely to be derived from the need to secure foreign aid, which then would be used for provision of private goods. The Kazakh government has been indeed criticized for the policies that were intended to raise its "democratic profile on the international stage with developed countries" from which they receive international fund.¹⁰⁸ Moreover, one study even claimed that the President's participation at 2002 World Summit on Sustainable Development was to receive aid for the Aral and Caspian Seas, and described his environmental rhetoric at the Summit as "subordinating the politics of ecology to the need for inter-ethnic and inter-religious stability in Kazakhstan, that is, to the stability of his own rule."¹⁰⁹

¹⁰⁷ Bueno de Mesquita *et al*, as cited in Cao and Ward, 2015, pp. 265.

¹⁰⁸ Knox and Yessimova, 2015, pp. 310.

¹⁰⁹ Soltys, 2014, pp. 350-351.

Chapter 4 Conclusion

This study began with the question of whether ideational factors have impacts on the countries' efforts of mitigating climate change. And it found out that national performance of climate mitigation was indeed affected by ideational factors, specifically (post)materialist values and cosmopolitan orientation, and further examined how these variables interacted with regime types. Statistical analysis in chapter 2 showed that countries with higher levels of postmaterialism correlate with climate mitigation performance, represented by CO₂ emissions and environmental indicators.

Additionally, this study found out that the effect of postmaterialism that decreases CO₂ was reversed in authoritarian states thus, increasing the emissions, while the effect of materialism that increases CO₂ became much greater in democratic states. South Korea and Mexico were compared to demonstrate the effect of postmaterialist-materialist value orientation on national performance of climate change mitigation. By examining climate discourse used in presidential remarks, it argued that Mexico's mitigation performance was better than South Korea's due to the differences of postmaterialism-materialism scale.

This study also found out that countries with higher level of perception as a world citizen have higher level of performance at preserving ecosystem and natural resources but not necessarily at reducing CO₂ emissions. Nonetheless, the positive effect of cosmopolitanism on CO₂ trend decreased in democracies, thus leading to better outcome and vice versa in autocracies. Cosmopolitan orientation's effect on CO₂ emissions became significant when interacting with the level of industrialization. Negative effect of cosmopolitanism on CO₂ emissions became weak to the point where it increases the level of CO₂ in developing countries, whereas the effect becomes stronger in industrialized economies, thus reducing even more CO₂.

Ukraine and Kazakhstan were compared to illustrate how political regime

types moderate the effect of cosmopolitanism on annual trend of CO₂ (CO₂T) by examining the activities of civil society and their interaction with the government. The Kazakh civil society was unable to participate at the process of policymaking under the centralized system that manages the very channels that NGOs have access to and thus, it was difficult for cosmopolitan constituents to affect climate mitigation policies. On the other hand, Ukraine's democratic institutions allowed NGOs who were concerned about climate change to participate at the process of policymaking. Based on the differences between the two countries, this paper argued that Ukraine's mitigation performance was better than Kazakhstan.

Limitations of this study is that it only showed correlation between ideational factors and climate mitigation by countries. Although case studies were conducted, they relied on indirect evidence instead of demonstrating the causal link and thus, were limited in explaining the way in which domestic constituents and policymakers formulate and implement climate policies, which will in turn lead to environmental performance. Another limitation is that this paper focused on two types of ideational variables as a preliminary step, but later studies could apply more systematic approach in distinguishing ideational variables. Moreover, this paper relied on data from WVS, which was not a systemic measurement of cosmopolitan orientation for the second dependent variable, perception as world citizens.

Nevertheless, findings of this study imply that ideational factors should be included in the efforts of formulating policies and contemplating strategies to achieve NDC goals under Paris Agreement and carbon neutrality along with economic and socio-political factors. Responses to climate change are more urgent than ever not only because the Earth is rapidly warming but also, because some governments are seeking to further expand carbon pricing to achieve net-zero carbon emissions. Since the inauguration of Biden administration, the United States has begun to actively push climate agenda, including a plan to impose carbon taxes. Moreover, the European Commission has released a package proposal called 'Fit for 55' which delineates a plan to introduce carbon border adjustment mechanisms

(CBAM)¹¹⁰ and to further extend the areas where emissions trading system is applied. Recent initiatives to impose carbon taxes by the European Commission and the United States thus pressure many exporting countries to use renewable energy and reduce greenhouse gases emissions. Yet generating clean energies alone would not suffice for mitigation because social approval and active participation by prosumers are required for energy transition and transformation into a low-carbon society. Some countries, for instance, are having challenges in installing solar panels and offshore/onshore wind power because they face oppositions by locals.

Accounting for value orientations and attitudes can be helpful in solving political gridlock that impedes climate mitigation. For example, in countries made up of materialistic constituents, policies that provide and emphasize economic incentives for activities that reduce GHGs could be more effective for climate mitigation. Expanding the scope of carbon pricing and ETS can incentivize businesses to choose renewables over fossil fuels. On the other hand, in countries made up of postmaterialist constituents, policies that emphasizes benefits for improved quality of life, such as Japan's Future City Initiative, could lead to more effective outcome. Environmental organizations could also lead their advocacy more effectively if they coordinate their campaign messages in ways that gear to post-materialist values and cosmopolitan orientation. Finally, follow-up studies could further develop the preliminary framework on the process of ideational variables leading to environmental outcome and further specify the differences between types of ideational variables and regime types.

¹¹⁰ CBAM imposes taxes on imported goods that produces extensive amount of carbon dioxide.

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Appendix A. Questions used to aggregate the 12-item measure¹¹¹

V60. People sometimes talk about what the aims of this country should be for the next ten years. On this card are listed some of the goals which different people would give top priority. Would you please say which one of these you, yourself, consider the most important? (*Code one answer only under “first choice”*):

V61. And which would be the next most important? (*Code one answer only under “second choice”*)

A high level of economic growth

Making sure this country has strong defense forces

Seeing that people have more say about how things are done at their jobs and in their communities

Trying to make our cities and countryside more beautiful

V62. If you had to choose, which one of the things on this card would you say is most important? (*Code one answer only under “first choice”*):

V63. And which would be the next most important? (*Code one answer only under “second choice”*):

Maintaining order in the nation

Giving people more say in important government decisions

Fighting rising prices

Protecting freedom of speech

V64. Here is another list. In your opinion, which one of these is most important? (*Code one answer only under “first choice”*):

V65. And what would be the next most important? (*Code one answer only under “second choice”*):

A stable economy

Progress toward a less impersonal and more humane society

Progress toward a society in which Ideas count more than money

The fight against crime

¹¹¹ World Values Survey, “WV6_Official Questionnaire,”

www.worldvaluessurvey.org/WVSDocumentationWV6.jsp, pp. 5, accessed on May 17th, 2021.

국문초록

본 학위논문은 기후변화 완화성과에 대한 기존연구가 경제적 수준과 사회정치적 요인에 한해 이루어진 것에 대해 문제의식을 가지고 관념적 요인이 국가들의 기후변화 완화성과에 영향을 미치는지의 여부를 탈물질주의-물질주의 가치관과 세계시민의식의 요인을 중심으로 살펴보았다. 이를 위해 본 연구는 통계분석과 사례연구를 통하여 그 효과를 파악하고, 관념변수와 정치체제변수가 결합될 시 나타나는 영향을 확인하고자 하였다.

제 2장에서 회귀분석을 통해 탈물질주의 가치관과 기후변화 완화 성과가 상관관계가 있음을 증명하였으며, 이러한 탈물질주의의 긍정적 효과는 권위주의 국가에서 작아지는 것으로 나타나는 것으로 나타났다. 탈물질주의 가치관의 효과를 심도 깊히 파악하기 위해 한국과 멕시코를 비교분석하였다.

제 3장에서 본 연구는 지구시민의식이 생태계 활력 수준을 제외한 기후변화 완화 성과에서 유의미한 상관성이 없음을 확인하였으며, 이산화탄소 증감률에 대한 지구시민의식의 효과는 정치체제에 따른 조절효과를 가지는 것을 입증하였다. 이러한 효과는 우크라이나와 카자흐스탄 간 비교분석을 통해 파악되었다.

주요어: 기후변화, 완화, 탈물질주의, 물질주의, 세계시민의식, 세계시민주의, 환경성과
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