

# Climate Policy Support in a Comparative Perspective: Exploring the Meaning and Significance of Political-Economic Contexts.

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## *Abstract*

While many countries have pledged to reduce GHG-emissions, the choice of national climate policy measures demonstrates a widespread variation. Although system of government, path-dependency and economic entanglements can explain a certain amount of variation in policy choice, research also points specifically towards the highly politicized nature of climate policy instruments and their sensitivity to public support as explanatory factors for cross-national differences. Previous studies have demonstrated that country-specific contextual factors determine both general preferences for environmental protection and public preferences for types of policy instruments. In particular, a country's prevailing political culture and its level of quality of government (QoG) is expected to have significant consequences for the prospects of gaining public support for different policy measures and will thus be key to understanding the viability of different climate policy designs. However, since countries also differ in their relative climate impact due to varying economic dependency on climate detrimental industry, this might also be a significant factor determining both public attitudes and subsequent political decisions. This paper applies unique, original survey-data from two countries with significant variation to explore how, and to what extent, economic context interacts with and moderates the effect of individual-level factors on public support for climate policy measures. By applying a two-case comparative design, the paper explores variations in this regard. Two small, Scandinavian states (Sweden and Norway), each accounting for only a fraction on global GHG emissions, but with clearly different economic dependencies, are compared. Thus, the paper provides important knowledge about how differences in political-economic context affect the prospects for diverse routes to increased public support for climate policy measures.

## Introduction

To what extent are domestic economic dependencies determining public attitudes, and thus also governmental responses, in relation to climate mitigation policy? Several recent studies show that although public concern about climate change is consistently high in both the developing and developed world (Kim & Wolinsky-Nahmias 2014) and many countries equally have pledged to reduce GHG-emissions, both the level of emission reductions (or at least the levelling out of the emissions) as well as the choice of national climate policy measures, demonstrate a widespread variation (cf. Jordan 2005, IPCC 2014). When considering, for example, the differences in policy output among EU member-states, it is evident that some countries are far more successful than others both in designing and implementing effective climate policies. How can this variation be understood?

Previous research points specifically towards the highly politicized nature of climate policy instruments and their sensitivity to public support as explanatory factors for cross-national differences. The findings in the rather rich literature on the opinion-policy nexus, suggesting both that the public actually notices what policy-makers do and responds accordingly (e.g. Jacobs 1993, Wlezien 1995) and that policy-makers take public opinion into account when making decisions (Page & Shapiro 1983, Stimson, MacKuen & Erikson 1995, Glynn et al. 1999, Burstein 2003, Wallner 2008), imply that *public attitudes* matter for policy choice and contribute to the cross-country variations that we see in regard to choice of climate policy measures. A range of *individual-level* factors have been shown to influence public attitudes towards climate policy measures, including values, ideology, personal norms, environmental concerns and beliefs, as well as the degree of political, institutional, and interpersonal trust.

But single-handedly, individual-level factors can hardly explain the country-specific differences that we see on the aggregate-level. It is reasonable to assume that also contextual factors contribute to this variation. Previous research propose that several contextual attributes, such as political culture, system of government, path-dependency, and the informal institutional structure, help explain cross-country variation in both outcome and policy choice (cf. Cherry et al 2014, Harrison & Sundstrom 2010, Lachapelle & Paterson 2013). However, we here focus on a less explored factor for empirical

analysis: a country's *economic dependencies on fossil fuel production*. This, we argue, may potentially impact public attitudes towards mitigation policies and -measures and, in prolongation, thus also the observable variation in countries attempts to combat climate change.

More specifically, this paper aims at exploring if, how, and to what extent the context of fossil fuel economic dependency determines public support for climate policy measures. To do so, we apply unique, original survey-data from two small European states that share a vast number of contextual features, including an almost identical political culture, but simultaneously differ greatly in their economic dependency on climate-detrimental industry: Sweden and Norway. As these two countries are indeed highly similar judging by other relevant contextual factors, we thus propose that potential differences found in policy support reasonably are attributable to the fact that the Norwegian economy is fundamentally dependent on fossil fuel production, whereas Sweden's is not.

The article proceeds as follows. In the next section, we first discuss our dependent variable, support for climate policy measures, and we then theorize how economic dependency may affect support more directly. In order to explore the causal link between context and public policy support, we subsequently introduce personal outcome expectancy/economic self-assessment, hypothesizing that this individual-level factor can either serve a mediating or a moderating function in our model. Thereafter we introduce our two cases, Sweden and Norway, and we more thoroughly explain the logic behind our selection of countries. In the next section, we account for our data, provide econometric details of how we make our variables operational and finally we introduce our methodology. This section is followed by our results, a discussion and finally a concluding remark in which we discuss policy implications of our findings and suggest new paths beyond this study.

## Theory and Hypotheses

In his seminal work *The Logic of Collective Action* (1965), Mancur Olson argues that without “coercion or some other special device”, rational individuals will not voluntarily cooperate in collective action situations “unless the group is very small”. Although this claim has been partly refuted (e.g. Lubell et al. 2007), examples of people voluntarily cooperating on a larger

scale are still strikingly rare. This is particularly tangible in large-scale settings, such as climate mitigation, involving a vast number of anonymous actors and significant gaps between causes and effects. Therefore, the predominant pattern is that a third party, typically the State, must introduce measures to create collective action, for example by lowering uncertainties, producing behavioural regularities, and altering the costs of defective behaviour (cf. North 1990, Mansbridge 2014). A growing body of research therefore suggests that the relationship between the third party and those making up the collective, and in particular the specific policy measures the third party uses to create cooperation, must be accounted for when attempting to better understand and theorize the prospects for governing collective behaviour. Of particular interest here is the degree to which involved actors will support the implementation of new, coercive policy measures, as this is believed to significantly affect the effectiveness and efficiency of the third party involvement. For example, public policy support reduces the government's cost for monitoring and enforcing compliance, as those affected by the policies will refrain from attempts to cheat or free-ride to a greater extent. If, on the other hand, measures introduced to govern cooperation are perceived as inappropriate, unjust or disproportional, the cost for monitoring will rise rapidly, making it increasingly difficult for the state to maintain collective action (Ostrom 2005).

### Individual-level approaches to policy support

Over the past decades, increased scholarly attention has been directed towards better understanding the conditions under which policy measures in general, and climate policy measures in particular, enjoy public support. In this endeavour, a number of studies explore the individual-level mechanisms behind environmental sentiments and how they subsequently translate into policy attitudes, equating policy support with other forms of low-cost pro-environmental behaviours (Stern 2000).

Going beyond traditional socio-economic explanations to public opinion, ample evidence points in the direction of psychological factors as key to understanding how policy attitudes develop and vary on the individual level, both in general (cf. Brewer & Gross 2005, Feldman 1988) and in the environmental field specifically. These motivational models, focusing personal

value-priorities (e.g. Jagers et al. 2014, Nordlund & Garvill 2003, Schultz & Zelezny 1999), environmental beliefs (e.g. Lubell et al. 2007, Finkel et al. 1989; Dunlap et al. 2000) or personal norms (Stern et al. 1995, Guagnano et al. 1995, Widegren 1998, Nordlund & Garvill 2002) assert that pro-environmentalism is primarily anchored in collective interests (e.g. Sagoff 1988) and that moral and normative concerns thus play a significant role in guiding behavioural choice. Empirical applications demonstrate that motivational factors contribute significantly to explain a range of low-cost behaviours, such as general policy support (e.g. Steg & Vlek 2009). However, their explanatory strength nevertheless varies considerably across specific policy measures, both in terms of policy design and type of behaviour being targeted (Nilsson & Martinsson 2012; Jagers et al, 2016, Jagers & Matti 2010; Steg et al 2005). These apparent variations suggest that ambitions to elucidate factors influencing the level of support for policy measures need to go beyond personal motivation and also consider perceptions of individual and collective consequences of the proposed policy measure as potential explanatory factors.

As of late, therefore, increasing interest have been directed towards policy-specific beliefs, or the perceived characteristics of the policy measure, as mediating the effect of personal motivation on policy attitudes. The significance of personal perceptions for the formation of attitudes is evident in research on traditional political behavior (e.g. Fiske & Taylor 1991; Zaller 1992; Caprara et al. 2006; Tversky & Kahneman 1986). For environmental policy support in specific, Reinstra and colleagues (1999) focus the perceived effectiveness of a policy instrument; Jacobsson and colleagues (2000) incorporate perceptions of the policy measures effect on fairness and personal freedom; and Schade and Schlaug (2003) add to these frameworks by opening up for personal outcome expectations as a possible factor. Other studies (e.g. Eriksson et al 2006; Kallbekken and Saelen 2011; Kallbekken et al 2013) propose more comprehensive models where several different policy-specific beliefs are combined. Following the multiattribute evaluation model (Samuelsson & Messick 1995), the individual's evaluation of a policy measure is thus hypothesized to be based on at least three dimensions: the extent to which the measure is perceived as (a) effective; (b) fair; and (c) limiting freedom of choice.

## The importance of context

Apart from individual-level motivation, there are strong indications also that country-specific contextual factors matters for the possibilities of gaining support for public policy measures. The mere fact that policy choice varies considerably between countries seems supportive of this assumption. Researching cross-country variation, communal preferences for environmental protection in general is typically attributed to levels of environmental concern triggered by economic affluence (Franzen & Vogl 2013) or Inglehart's (e.g. 1990) post-materialism (but see Gelissen 2007; Marquart-Pyatt 2007; Dunlap and York 2008 for a critique). Furthermore, recent studies have linked a country's quality of government both to policy choice and to the public's attitudes toward these choices. For instance, Svallfors (2013) demonstrates how people living in countries with high levels of institutional quality are generally more supportive of taxes, and Haring (2014a) shows that corruption drives public support for stricter use of legal regulations. Lastly, cross-country differences in political culture, that is the dominant norms and values in a society (e.g. Eckstein 1996), have proved decisive for both individuals' policy attitudes and governmental action (e.g. Cherry et al 2014, Inglehart & Baker 2000, Schwartz 2006, Bardi & Sagiv 2003). For example, in societies where individual autonomy and active self-assertion is highly valued, policy preferences are likely to favor less governmental regulation and more market-based instruments. In contrast, a cultural emphasis on group well-being and egalitarianism is likely to be expressed in more cooperative systems with a significant element of state power.

Another prominent claim in the research on cross-national environmental attitudes is that economic factors serve as to explain a great deal of variation among countries' propensity to take political action. Although the evolutionary psychology-hypothesis of Inglehart (e.g. 1974, 1990), suggesting that rising affluence leads individuals to emphasize self-expressive and pro-social values over basic economic and physical security, have been refuted in empirical research focusing the antecedents of environmental attitudes (cf. Brechin & Kempton 1994, Brechin 1999, Dunlap et al. 1993, Dunlap & Mertig 1995, Dunlap & York 2008, Givens & Jorgenson 2011, Kidd & Lee 1997, Mostafa 2011), economic factors remain a key factor in studies attempting to explain cross-national variation in environmental

policy output. In particular, several studies suggest that fear of negative economic consequences on both the overall national-, as well as on the individual-level, arising from increased environmentally protective measures affects environmental policy attitudes in a negative direction. Thus, similar to the distinction between collective concerns and rational self-interest as competing explanations to policy attitudes on the individual level, explanations related to collective beliefs (i.e. political culture or quality of government) are also on a contextual level challenged by explanations rather focusing economic costs and benefits.

Looking towards political practice, the latter seems to have certain merits. For example, a common conclusion from studies of global climate negotiations is that oil-producing countries are reluctant to support the introduction of forceful emissions-targets and restrictions on the use of fossil fuels both domestically and on a global level, reasonably by fear of losing out economically if a transition to other energy sources becomes a widespread reality. Analysing the outcomes of early global environmental negotiations, Sprinz and Vaahoranta (1994) found that a country's economic capacity, alongside its vulnerability to environmental degradation, significantly explain preferences for international environmental regulations. Furthermore, Borick (2010) demonstrates how perceived high costs for addressing climate change regularly have delayed political decisions on strengthened climate mitigation in the US. In line with this, there should be strong reasons to expect that a country's relative economic dependency on climate detrimental industry also affect the formation of policy preferences among the individuals living there. Based on the above discussion, we propose as our first, overarching hypothesis to be tested that a context of economic dependency on fossil fuel production affect climate policy support negatively:

*H<sub>1</sub>: Context (country economic dependency) affect public support for climate policy measures.*

Furthermore, since the reasons for the negative effect of economic dependency on policy support is linked to a fear of economic losses due to infringements on important industrial ventures, we also add a second hypothesis, proposing that:

*H<sub>2</sub>: The negative effects of context (country economic dependency) on policy support are more tangible when the policy measure in question is directed specifically towards oil-producing industry.*

### The moderating effect of self-assessment

As mentioned above, previous research on political preference-formation suggests that attitudes towards a policy measure, for example support for the introduction of CO<sub>2</sub>-taxes rather than carbon trading schemes or increased emission-regulations, are linked to the measure's perceived characteristics, or policy-specific beliefs. Put shortly, the attributes of a policy instrument moderate the effect of individual motivation on policy support (cf. Eriksson et al. 2006, Kallbekken et al. 2013). Indeed, although pro-environmental behaviors are usually governed by a value-based sense of collective benefits, an individual's decision *not* to support the introduction of a specific policy instrument rather tends to be motivated by consequences for personal utility (cf. Frey 1997, Guagnano et al 1995). Apart from the perception of the policy measure's consequences for personal freedom, its effectiveness and distributional effects, studies have also demonstrated how personal outcome expectations, or *economic self-assessments*, strongly affect policy support. This refers to the extent to which an implementation of a policy instrument is expected to imply consequences for the individual, e.g., in terms of higher costs, either for not changing behavior despite the policy, or for committing to behavioral change (Jakobsson et al 2000, Schuitema et al 2010, Joireman et al 2001).

That personal outcome expectancies influence policy attitudes and behavior is not a new discovery per se. For example, models drawing on standard rational choice theory (e.g. Arrow 1951, Olson 1965) generally assume that individuals are motivated by a rational self-interest to maximize personal utility and minimize personal costs. This leads proponents of neoclassical economics and public choice to suggest that individuals will support the introduction of a policy instrument, or engage in collective action, in so far as their behavior is perceived to further these goals. The weighing of costs and benefits is also a main element within both the Theory of Planned Behavior (Ajzen 1991) as well as the collective interest model of collective action (Lubell et al 2007), predicting that decisions to engage in collective

action are preceded by a calculation of the expected value and cost of cooperation. Seen from this perspective, we assume, in accordance with hypotheses 1 and 2, that the more the level of general welfare in a country stem from industries or production activities known to be detrimental to the climate, the more likely it will lead people to perceive climate mitigation policy as implying also indirect individual costs, and thus affect their willingness to support policy measures to this effect.

However, to open up for the possibility that the reality of a country's economic dependencies not is decisive for how country- (and in prolongation also individual-) consequences are perceived by the individual, and allowed to affect policy support, we also include a third hypothesis. This rather suggest that the extent to which economic context affect policy support is conditioned by whether or not the individual actually perceives strengthened climate mitigation policies as yielding negative effects on the domestic economy:

*H<sub>3</sub>: The effect of context on public support for climate policy measures is moderated by self-assessment of economic consequences.*

In other words, although we cannot statistically confirm a direct effect of context on policy support, this might be due to aggregate differences in self-assessment between the two countries.

## Selection of cases

As indicated, for the purpose of this article we use a two-country comparative design to test our hypothesis. Selecting Sweden and Norway as cases allows us to compare public attitudes to climate policy measures in two countries that are culturally and politically highly similar, although differs greatly in their dependency on fossil fuel production for the domestic economy. Although neither Sweden nor Norway is dependent on fossil fuels for electricity, the Norwegian economy is highly sensitive to a global phasing out of fossil fuels. With some temporal fluctuations, the Norwegian production and export of oil and gas from off-shore wells in the North Sea have accounted for up to above 20 % of the GDP, 25% of the governmental revenues and close to 50% of all the export since 1969 (Swedish national mediation office 2016, Haussmann & Hidalgo 2012). During the same period, Sweden has had no proceeds from fossil fuels. Thus, it is quite plausible that, compared to Swedes, Norwegians

are less supportive to policy instruments aimed at lowering the consumption of fossil fuels (both in Norway and elsewhere), since a maintained high living standard in Norway today is dependent upon a continued global consumption (and consequently production) of oil and gas.

Furthermore, the significant political and cultural similarities between Sweden and Norway allow us to isolate the possible effect of the economic dependency-context and thus ruling out that other contextual variables, such as political culture, drive any differences in aggregated policy support. Both countries are highly profiled as global environmental leaders, going back at least to the Stockholm summit of 1972 and the Brundtland declaration of 1989. Empirical measures of political culture consistently place Sweden and Norway in the same cluster of countries sharing a Scandinavian political culture, i.e. a strong emphasis on value-orientations of harmony, intellectual autonomy, and egalitarianism, as well as a low emphasis on value-orientations suggesting preferences for embeddedness, mastery and hierarchy (cf. Schwartz, 2006). Similarly, the both countries share high scores on the World Values Survey's secular-rational as well as self-expression dimensions (e.g. Inglehart & Baker, 2000). In practical politics, these similarities are manifested through, among others, a long tradition of social democratic rule, a build-up of a universal welfare state during the mid-1900s and onward, as well as a tradition of a strong international presence on issues such as peace and the environment.

Some of these cultural similarities are doubtless a result of a still ongoing process of diffusion of values, norms, practices, and institutions (cf. Naroll, 1973), due to geographical closeness. But, shared history, language, religion, and level of development between the two countries also play a part. Since before the formation of the modern States, the two neighboring countries share a common history and have during periods even been under the same rule. Between 1814 and 1905, Sweden and Norway formed a union (*The United Kingdoms of Sweden and Norway*). At present time the exchange between the two countries in terms of trade, culture and politics are extensive. Also the political-administrative systems in Sweden and Norway are highly similar, both being established constitutional monarchies and unitary states with a unicameral parliamentary system elected through proportional representation (cf. Lijphart 1974), and a, perhaps somewhat

declining, corporatist model of policy-making (Molina & Rhodes 2002). A tangible difference is that Sweden since 1995 is part of the formal institutional structure of the EU. However, we do not expect the EU-membership to affect individual climate policy attitudes in any significant way.

## Data and Methods

Data was collected through web-surveys administered by the Laboratory of Opinion Research (LORE) at the University of Gothenburg, Sweden. In Sweden, data collection was included in wave 14 of the Swedish Citizen Panel, run by LORE (see more on [www.lore.gu.se](http://www.lore.gu.se)). The fieldwork lasted 27 days between February 5 and March 5, 2015. After two sets of reminders, the participation rate in this study was 78.5 %, resulting in a total of 2708. The Citizen Panel sample in these studies are combinations of non-probability and probability respondents (56/44) and is pre-stratified on four dimensions: gender, age, education and geographical location. Simultaneously with the end of the Swedish field-period, data collection in Norway, repeating the questions asked in Sweden, was commenced through the sample provider Cint ([www.cint.com](http://www.cint.com)). The aim for the Norwegian quota sample, based on a combination of gender and age, was 2,000 responses. After 16 days of fieldwork, from March 16 to March 31, a total of 1942 responses had been collected. The socioeconomic characteristics for the two samples are displayed in Table 1.

Table 1: Socioeconomic sample-characteristics (standard deviation in parenthesis)

	Norway	Sweden
Female (%)	46	50
Education	2.41 (.601)	2.44 (.599)
Income quartiles	2.2312 (.93039)	2.4845 (1.06517)
Ideology (1=far left, 10=far right)	5.04 (2.423)	4.46 (2.452)
Environmentalism (1=not green at all, 10=very green)	5.76 (2.482)	6.09 (2.512)
Personal environmental norm (index 1-7)	4.74 (1.307)	5.03 (1.240)
Sample size	1942	2708

Although small, the country differences are statistically significant for all socioeconomic characteristics. The Swedish sample contains a larger share of women, are slightly better educated and better paid. Ideologically, Swedish respondents identify themselves as slightly more to the left and as holding a more environmentalist ideological orientation than their Norwegian counterparts. This is also reflected in the strength of the personal environmental norm, which is more tangible in the Swedish sample. Based on these characteristics alone, we should expect Swedes to be slightly more positive towards environmentally protective measures in general and we therefore control for socioeconomic factors in all further analyses.

As further elaborated above, a variety of pro-environmental policy measures have been proposed, developed and implemented by governments across the world attempting to overcome large-scale environmental problems and, thus, induce positive individual-level behavioral changes. In this article, we analyze the antecedents of public support for a set of three different CO<sub>2</sub>-taxes, as this type of measure have a direct effect on the demand for fossil fuels and thus on the economy of the producing industry. CO<sub>2</sub>-taxes are also regularly put forward as one of the most effective means for climate change mitigation (e.g. Sumner et al. 2011) It should be noted, however, that certain forms of carbon taxes, e.g., directed towards personal consumption, have been in place in both Sweden and Norway since the early 1990s. As 25 years have passed since their introduction, this study amounts to a hard test for the significance of contextual factors, as we should expect both Swedes and Norwegians to be more positively inclined to CO<sub>2</sub>-taxes than to the introduction of a completely novel policy measure (cf. Hammar & Jagers 2009).

For measuring our main dependent variables, we asked the respondents to indicate their attitude towards (1) a CO<sub>2</sub>-tax on fossil fuels used by citizens, (2) a CO<sub>2</sub>-tax on fossil fuels used by the industry, and (3) a CO<sub>2</sub>-tax specifically directed towards the fossil fuel producing industry. Responses ranged from -3 (completely against) to +3 (completely for), with 0 labeled as neither against nor for. We expect that the support for CO<sub>2</sub>-taxes targeting citizens will be overall lower since they affect most the respondents more directly, but also that, relatively speaking, the economic context will have more tangible effects on support for CO<sub>2</sub>-taxes targeting fossil fuel producing

industry.

In order to tap the respondents understanding of the effects of climate change mitigation-policies on their country (economic self-assessment), two questions were asked. First, on a response-scale from very negative (1) to very positive (7), respondents were asked to indicate how they believed their country's economy would be affected by forceful political measures to deal with climate change. Second, on a scale between much less (1) to much more (7), they were also asked to compare the economic effects on their country with the effects on other comparable industrialized countries. Creating an index of these two self-evaluation questions is not possible, due to a all to low scale-reliability (Cronbachs  $\alpha=.093$ ). Therefore, we included them independently in the analyses. In addition, the analyses include a number of control-variables, previously demonstrated as being significant for pro-environmental policy support (e.g. Steg et al. 2005, Stern et al. 1995): *ideology* (self-reported on a scale from far left [1] to far right [10]), *environmentalism* (self-reported on a scale from not green at all [1] to very green [10]), and the strength of a *personal environmental norm*. The latter is an index composed of six questions tapping the respondents feeling of moral obligations to personally act in favor of the climate (Cronbachs  $\alpha=.833$ ). The context of *economic dependency* is included in the analyses as a dummy-variable (1 if the respondent is from Norway, 0 if the respondent is from Sweden). Thus, if the importance of economic context, as predicted in the theory-section, holds true, we should expect this coefficient to turn out negative (and significant) in our regressions.

## Empirical results

### *Descriptive data*

We start our analysis by first considering overall differences in policy support for our two cases. As expected, on average, our results suggest that Swedes are more supportive of CO<sub>2</sub>-taxes than Norwegians, although the differences are small and the overall support is unexpectedly high in both countries<sup>1</sup>.

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<sup>1</sup> In a couple of national Swedish surveys (representative samples) in the early 2000s (-02 and -03), the general support for a CO<sub>2</sub>-tax was only around 20% and the mean value considerably lower than in the current survey, together indicating that the support for these types of taxes have increased over the past ten years (see Hammar & Jagers 2009).

Furthermore, public policy support is lower for taxes directed towards private consumption than for taxes directed towards industry. When asking about CO<sub>2</sub>-taxes on fossil fuel producing industry, we get the strongest average support in both cases.

Table 2: Support for CO<sub>2</sub>-taxes. Mean values, standard deviation in parentheses.

	Norway	Sweden
1. CO <sub>2</sub> -tax on citizens	3.69 (1.930)	3.92 (1.888)
2. CO <sub>2</sub> -tax on industry	4.78 (1.858)	5.11 (1.732)
3. CO <sub>2</sub> -tax on fossil fuel producing industry	4.80 (1.883)	5.10 (1.761)

Note: Differences are significant on the 99%-level: 1.  $t(4126)=-4.154$ ,  $p<.001$ ; 2.  $t(4586)=-3.600$ ,  $p<.001$ ; 3.  $t(4586)=-7.166$ ,  $p<.001$ .

These results are as expected. The consistently lower support in Norway, although comparing two very similar countries that share a strong official environmental-policy record and common history of play, seems to indicate that economic context do matter. However, as discussed above, we also propose that the effect of economic dependency on the individual's policy attitudes is mediated by the perception that strengthened climate mitigation will have a negative impact of on the domestic economy. To further scrutinize the attitudinal differences and their antecedents, we therefore consider, first, how Swedes and Norwegians position themselves on these economic self-assessment questions.

Table 3: Economic self-assessment. Mean values, standard deviation in parenthesis.

	Norway	Sweden
1. Economic effects on own country by strengthened climate mitigation policies	3.93 (1.357)	3.83 (1.456)
2. Economic effects in a comparative perspective	4.09 (1.273)	4.03 (1.191)

Note: Differences are significant on the 99%-level: 1.  $t(4586)=2.459$ ,  $p<.001$ ; 2.  $t(4477)=1.492$ ,  $p<.001$ .

Although it seems reasonable to assume that Norway, being a major producer of fossil fuels, will be negatively affected by stronger efforts to mitigate climate change (which, for example, would imply considerably

reducing the use of fossil fuels), Norwegian respondents do not perceive these effects as particularly negative, but rather position themselves close to the scale-midpoint. What is more, in this sample, Swedes in average perceive stronger *negative* economic effects from strengthened climate mitigation policies. For the second self-assessment item, the country-comparative results are more expected, although mean-differences are very small and the average answer again is close to the scale-midpoint. Compared to Swedes, Norwegians perceive economic effects to be slightly larger for their own country than for comparable industrial countries.

In table 4 below, we explore whether the responses to these self-assessment questions are driven by the respondents' beliefs (i.e. left-right ideology, environmentalism and the strength of a personal environmental norm). As evident from the correlation coefficients, the relationship between beliefs and self-assessment is as expected for both countries: People positioning themselves to the ideological right tend to be more prone to perceive negative economic effects from climate mitigation policies, and, in parallel, a stronger environmentalism as well as a more pronounced personal environmental norm drive more positive perceptions. As we also see, the relationship between these variables is *slightly* stronger in Sweden compared to Norway.

Table 4: Correlations for economic self-assessment and beliefs (Norway/Sweden).

	Ideology	Environmentalism	Personal norm
Economic effects (own country)	-.213**/-.343**	.404**/.475**	.422**/.465**
Economic effects (comparative)	.035/.043	.077**/-.066**	.058**/-.097**
Ideology		-.328**/-.351**	-.342**/-.299**
Environmentalism			.650**/.685**

Note: All coefficients are Pearson's r. Significant correlations are labelled as \* =  $p < .05$ , \*\* =  $p < .01$  (two-tailed). Although significant ( $p < .01$ ), the relationship between the two self-assessment items are very weak,  $r = .096$ , suggestion that people perceive stronger or weaker effects on the own country compared to other countries independently of whether they see these effects as being negative or positive.

### *Econometric results*

To further analyse our data and the effects of context, self-assessment and beliefs on policy support, we use ordinary least squares (OLS) regressions. In table 5, we consider the factors driving support for CO<sub>2</sub>-taxes directed

towards citizens. Using the complete set of respondents from our two cases allows us to test the significance of context through the inclusion of a Norway-dummy in the regression-models.

Table 5: Regression for the effects of context, self-assessment, and beliefs on support for a CO2-tax on citizens. Standardized coefficients, standard error in parentheses.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Ideology	-.106*** (.010)	-.106*** (.010)	-.072*** (.010)	-.072*** (.010)	-.073*** (.010)	-.051*** (.008)
Environmentalism	.268*** (.013)	.269*** (.013)	.217*** (.013)	.217*** (.013)	.216*** (.013)	.081*** (.010)
Personal norm	.285*** (.025)	.285*** (.026)	.219*** (.026)	.218*** (.026)	.217*** (.026)	.083*** (.019)
Economic effects (own country)			.241*** (.019)	.230*** (.023)	.238*** (.019)	.083*** (.015)
Economic effects (comparative)			-.033** (.019)	-.034** (.019)	-.073*** (.026)	-.035*** (.014)
Norway (dummy)		.000 (.049)	-.021* (.048)	-.059 (.141)	-.164*** (.164)	-.026*** (.035)
Norway*Economic effects (own country)				.042 (.034)		
Norway*Economic effects (comparative)					.156*** (.038)	
PSB Fair						.503*** (.014)
PSB Freedom						.064*** (.016)
PSB Effective						.201*** (.014)
Constant	.899*** (.124)	.900** (.126)	.472*** (.148)	.542*** (.161)	.760*** (.169)	-.025 (.109)
N	4484	4483	4344	4343	4343	4299
R2 (adj.)	.307***	.306***	.348***	.348***	.350***	.668***

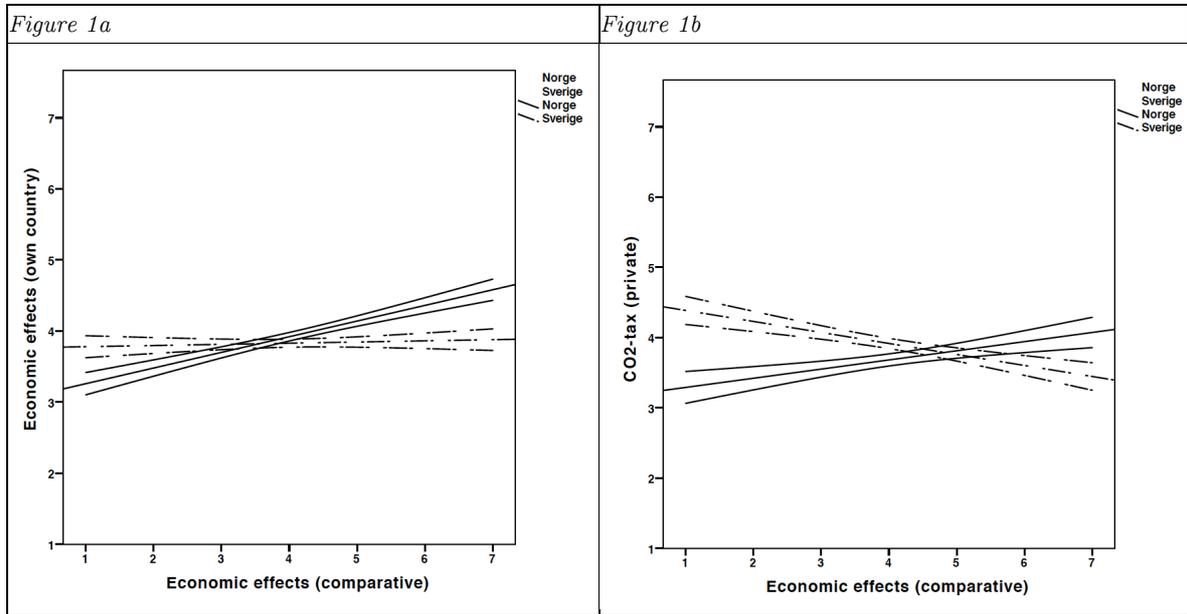
Note: \*\*\*  $p < .01$ ; \*\*  $p < .05$ ; \*  $p < .1$

In model 1, we test a traditional model where personal beliefs are used as predictors for policy support. Together, ideology, environmentalism and personal environmental norm explain about 30% of the variation in policy support, which is comparable with previous studies focusing individual-level effects (e.g. Steg et al 2005; Jagers et al 2016). In model 2, we add the contextual-factor to the list of independent variables in order to test the direct effect of economic dependency on policy support. As evident from the table, context have no significant direct effects on out dependent variable, nor does it contribute to the share of explained variance of the model as a whole. Model 3 adds the two economic self-assessment items to the model. Both items display significant effects on policy support, and, consequently, an increase in overall model-fit suggesting that these items contribute to determining policy attitudes. Although the effect of the individual-level factors decreases slightly when self-assessment is included, they remain significant and quite strong. When adding economic self-assessment to the model, economic context turns out significant at the 90%-level, affecting policy attitudes in the expected direction. These results seem to suggest that economic context on its own is a poor predictor of policy support, but that it is important for at least some categories of self-assessment responses.

In model 4 and 5, we explore this possibility further, i.e. that economic context, although not having a strong independent effect on policy support, might interact with economic self-assessment so that perceptions of economic consequences from strengthened climate policy affect support differently depending on context. Model 4 therefore includes an interaction-term for context and the assessment of economic effects for the own country, but without displaying any significant effects on policy support. In addition, the small effect of economic context now turns out insignificant. In model 5, however, adding the interaction-term for context and comparative economic effects, have tangible effects on our results. Although model-fit only increases slightly, the explanatory effect of the context-dummy becomes significantly stronger. However, the positive sign of the interaction-term suggests that perceiving the economic effects as comparatively larger in the own country affects policy attitudes in Sweden negatively, whereas the effect in Norway is positive. This, of course, should be a logical consequence of Norwegians overall having more positive views on possible economic effects following from

strengthened climate mitigation policies. In figure 1a below, the unstandardized predicted values of perceived economic outcomes for the own country are plotted against perceived comparative economic outcomes, and in figure 1b the unstandardized predicted values of policy support is plotted against perceived comparative economic outcomes. Here, we can clearly see differences between the two countries. *First*, suggesting that economic self-assessment attitudes in Norway become more positive as the comparative outcomes are seen as larger. *Second*, whereas a perceived comparative effect is affecting policy support positively in Norway, the effects are negative in Sweden.

Figure 1a & 1b: The significance of comparative economic effects



Lastly, model 6 includes three policy-specific beliefs that previously have been demonstrated as key determinants for policy attitudes (e.g. Eriksson et al 2006; Matti 2015). Including the PSBs in the analysis almost doubles model-fit, explaining almost 70% of the variation in policy support. Although all three PSBs display significant effects, perceiving a CO<sub>2</sub>-tax directed towards citizens as being fair present the strongest explanatory power. What is more, also the other factors in the model are affected by the inclusion of the PSBs. This is in line with theory, which suggests that evaluations of the specific traits of a policy measure are informed by personal values and beliefs. As the PSBs are included we thus note that they seem to

mediate the effect of left-right ideology, environmentalism and personal environmental norm, as the effect of these factors are clearly reduced. Moreover, the effect of economic context (Norway) is on about the same low level as in model 3. Clearly, however, there are several individual-level factors in our models that explain far more of the variations in policy attitudes than being in a context where the economic dependencies on fossil fuel production are substantial. Considering the small or even non-existent overall differences between Sweden and Norway on these policy-specific beliefs, as reported in table 7 below, further strengthens our conclusion that it is differences on the individual level, rather than on the contextual, that seems to drive policy attitudes.

In order to explore whether these results hold also for other types of policy tools, we conducted the same regression analyses on the support for CO<sub>2</sub>-taxes directed towards (a) industry in general, and (b) fossil fuel producing industry in particular. The results from these are displayed in table 6 below.

Table 6: Regression for the effects of context, self-assessment, and beliefs on support for a CO<sub>2</sub>-tax on industry. Standardized coefficients, standard error in parentheses.

	Industry			Fossil fuel producing industry		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Ideology	-.139*** (.010)	-.133*** (.010)	-.134*** (.010)	-.140*** (.010)	-.133*** (.010)	-.134*** (.010)
Environmentalism	.171*** (.013)	.172*** (.013)	.171*** (.013)	.157*** (.013)	.158*** (.013)	.157*** (.013)
Personal norm	.210*** (.025)	.204*** (.025)	.201*** (.025)	.236*** (.025)	.229*** (.025)	.227*** (.025)
Economic effects (own country)	.221*** (.018)	.227*** (.018)	.224*** (.018)	.221*** (.018)	.228*** (.019)	.226*** (.019)
Economic effects (comparative)	-.050*** (.019)	-.050** (.018)	-.094*** (.025)	-.051** (.019)	-.051*** (.019)	-.082*** (.025)
Norway (dummy)		-.050*** (.046)	-.212*** (.157)		-.061*** (.046)	-.172*** (.158)
Norway*Economic effects (own country)						
Norway*Economic effects (comparative)			.176***			.121***

			(.037)			(.037)
Constant	2.490***	2.554***	2.860***	2.391***	2.469***	2.683***
	(.142)	(.142)	(.162)	(.143)	(.143)	(.163)
N	4346	4345	4344	4348	4347	4346
R2 (adj.)	.319***	.321***	.323***	.332***	.335***	.336***

Note: \*\*\*  $p < .01$ ; \*\*  $p < .05$ ; \*  $p < .1$

Overall, we see the same pattern as for CO<sub>2</sub>-tax directed towards citizens. However, the model-fit in these industry-oriented models are somewhat reduced. Furthermore, we see that context is somewhat more important, as we expected, but still display rather weak effects on support and only marginally affecting model-fit. Thus, although context appear to matter on the marginal, our results quite clearly imply that individual-level effects are considerably stronger than context when it comes to explaining support for the different CO<sub>2</sub>-taxes. Culture matters in both Sweden and Norway; people are generally more positive to CO<sub>2</sub>-taxes in Sweden, and the differences are more likely due to individual traits common for both Swedes and Norwegians than consistent contextual patterns separating the two countries.

## Discussion

By selecting two highly similar small European states, Sweden and Norway, as our two cases, we indirectly control for a number of rivaling contextual factors such as general trust, quality of government, and political culture. At the same time, we have largest possible variation in the economic dependency variable, since Norway is heavily dependent upon oil and gas production, while Sweden completely lacks this kind of industry. Thus, if we do not find systematic attitudinal differences between Swedes and Norwegians, the economic dependency factor is perhaps not as significant as we (and others) previously have suggested.

Comparing the overall differences in policy support we find that Swedes are generally more supportive of CO<sub>2</sub>-taxes than Norwegians, although attitudinal differences are very small. We also find that public policy support is lower for taxes directed towards private consumption than for taxes

directed towards industry. All these results match our expectations. However, when we compare how Swedes and Norwegians position themselves on the more specific economic self-assessment questions, the results turn out a bit ambiguous. On the one hand, Norwegian respondents do not perceive the economic effects as particularly negative, but rather position themselves close to the scale-midpoint. Furthermore, Swedes perceive stronger negative economic effects from strengthened climate mitigation policies. For the second self-assessment item, though, the country-comparative results were more in line with what we would have expected. Although rather small mean-differences with the average answer close to the scale-midpoint, Norwegians perceive economic effects to be larger for their own country than for comparable industrial countries. As evident from the correlation coefficients, these self-assessment questions are, at least in part, driven by the respondents' beliefs. People positioning themselves to the ideological right are more prone to perceive negative economic effects from climate mitigation policies, and a stronger environmentalism as well as a more pronounced personal environmental norm drives more positive perceptions. However, in Norway, there is a positive relationship between the two self-assessment items, suggesting that Norwegians who perceive more positive effects from strengthened climate mitigation policies also foresee Norway to be comparatively more affected by these positive outcomes.

In the next step, we perform a number of OLS-regressions enabling us to better elucidate the explanatory power of the different independent variables and properly test our hypotheses. Analyzing data from both cases together, we find that the traditional individual-level factors; ideology; environmentalism; and personal environmental norm, together explain approximately 30% of all variance in the dependent variable. We then continue by including a test for contextual effects through our Norway-dummy, but without finding any significant effects. Similar patterns are also evident for all three types of CO<sub>2</sub>-taxes, where we only see a marginal effect of including the contextual variable. Thus, we find no convincing support for neither the first hypothesis saying that *context (country economic dependency) affect public support for climate policy measures*, nor for the second, suggesting that *the negative effect of context (country economic dependency) on policy support are more tangible when the policy measure is*

*directed specifically towards oil-producing industry.* Thus, at least in the case of Sweden and Norway, economic dependency on industry being detrimental to the global climate system does not appear to be a significant driver explaining whether or not individuals are supportive to climate change policy measures.

However, in order to further scrutinize the relationship between the economic context and policy support, we then include the two economic self-assessment items to the list of independent variables. This increases model-fit quite significantly, which imply that these additional variables also contribute to determining policy attitudes to a certain degree. However, the effect of the individual-level factors only decreases marginally, and remain significant and quite strong. When adding the self-assessment items, however, our context-item turns out both significant at the 90%-level and with the expected negative direction. It thus seems that the Norwegian context of economic dependency indeed do have an effect, but not the direct one as suggested by hypothesis 1 and 2.

In testing hypotheses 3, we therefore open up for the possibility that economic context adds explanatory value by interacting with economic self-assessment, i.e. that the Norwegian context do play a role for certain ranges of answers on these questions. To test this potential scenario, we first included an interaction-term for context and the assessment of economic effects for the own country. This operation did not display any significant effects on policy support. In addition, the small effect of economic context that we found before instead turned insignificant. However, when we added the interaction-term for context and comparative economic effects, the explanatory effect of the context-dummy did become significantly stronger. What is more, it changes direction so that perceiving comparatively larger economic consequences has a positive effect in Norway, but a small and negative effect in Sweden. Looking at the regression plots (figures 1a and 1b) further confirms that Norwegians have a more positive outlook on country consequences that might explain this effect. Thus, according to our analyses, we can confirm our third hypothesis, that *the effect of context on public support for climate policy measures is moderated by self-assessment of economic consequences.* Curiously, however, Norwegians are on average more positive despite their economic dependencies.

Given the overall rather small effects of economic context, we, lastly, test the strength of an additional set of individual-level factors: policy-specific beliefs. Our results clearly establish that a number of individual-level factors together explain more than 30% of the variation that we see in dependent variable, and adding the PSB-items almost doubles model-fit. An important conclusion, however, is that the variation in these items is mainly located at the individual level, between people who have certain ideological orientations, norms and environmental preferences regardless of where they live, as the systematic variations between the two countries are very small.

When conducting a comparison between Norwegians and Swedes support for CO<sub>2</sub>-taxes, we can rule out the argument that economic dependency is a contextual factor affecting people's propensity to be supportive, or not. Even though a major part of Norway's whole national economy is currently founded in and dependent upon oil and gas production, Norwegians are not significantly more hesitant to policy measures potentially threatening this "meal ticket" than Swedes are. Thus, even if context appear to matter on the marginal, our results quite clearly imply that individual-level effects are considerably stronger than context when it comes to explaining support for the different CO<sub>2</sub>-taxes. The variation in support that we find in the total sample, can instead be derived from various factors that are shared by both Swedes and Norwegians, e.g., those who are ideologically leaning to the right tend to be less supportive to CO<sub>2</sub>-taxes while environmentalists and individuals with strong personal environmental norms tend to be more supportive than others. In addition, those who believe that a CO<sub>2</sub>-tax is unfair, are simultaneously much more negative to CO<sub>2</sub>-taxes compared with other groups.

## Conclusions

We started off this paper asking to what extent economic dependency is decisive of public attitudes and therefore also to governmental response towards climate mitigation policy? Whereas we do not find any direct effects of economic context of policy support, we do find that context interacts with economic self-assessment. However, these effects go in the reversed direction

than what was expected, suggesting that context do not affect policy support in the proposed direction.

Rather than forwarding economic dependency as a contextual factor explaining variation in policy support among countries, our results imply that this variation is instead affected by variation that we find in a number of individual-level factors. Instead, almost all explained variance in our regression models are generated by a) differences in people's ideological orientation, personal norms and environmentalism (approx. 30% explained variance) together with b) specific beliefs about the policies (together amounting to almost 70% explained variance). Thus, if Swedes are somewhat more supportive to CO<sub>2</sub>-taxes than Norwegians, this is rather because some Swedes have a slightly different ideological orientation, slightly stronger personal norms and slightly stronger environmentalist views than Norwegians and not because Swedes are less concerned with how these policies will affect the national economy of theirs. Indeed, Swedes do have a more negative view on country effects compared to the rather positively inclined Norwegians.

These findings are quite intriguing and generate some food for thought. For example, is it really a good enough justification to say that economic dependency is never a major factor just because it did not turn out to be a significant factor in the two cases of Norway and Sweden? Probably not. We therefore suggest that the same type of analyses should be performed in additional countries where economic dependency is equally divided, e.g., in Venezuela and Colombia or between different US states sharing basically the same ideological and cultural abode. Furthermore, it is worth pondering upon what trigger or causes the differences that we see in the individual-level factors? A not too far fetched answer here would be political culture, which may both affect things such as social (and thus also personal) norms, ideological orientation (Anglo-Saxon political culture probably shift the ideological orientation to the right on a left-right scale, especially compared to egalitarian societies such as Sweden and Norway) and political culture possibly also affect both degree of environmentalism and what policy-specific beliefs people hold. Also such a line of reasoning calls for comparison. An interesting complement to the two cases of Sweden and Norway would be a systematic comparison with, e.g., Australia and New Zealand, who both share

a similar historical and cultural path while at the same time differ significantly in regard to economic dependency of fossil fuel production. Lastly, Sweden and Norway are both “small states” when considering overall contributions to global GHG-emissions. In comparatively larger states, the effects of personal norms on policy support might be even more tangible as also feelings of responsibility among the environmentally engaged increase with size.

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