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TRUST, VALUES, AND QUALITY OF GOVERNMENT

Exploring the interaction between individual and contextual level determinants of environmental tax support

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ABSTRACT

Environmental taxes are argued to be the key to more effective environmental protection in developing countries. This paper investigates whether such taxes have the necessary public support to be successfully implemented in different contexts, including countries outside the Western and European spheres. Applying a multilevel analysis approach, using data from the World Values Survey and International Social Survey Programme, interaction effects between values, political and social trust, and perceived quality of government (QoG) are explored. It is hypothesized that if people lack trust in public authorities to implement green taxes in an efficient, fair and uncorrupt manner, they will be less likely to support such taxes despite their strong pro-environmental values or trust in other people. The results show that people holding green values are more likely to support environmental taxes if they live in countries with high levels of QoG. Moreover, the effect of social trust on support for green taxes appears to be contingent on individual-level political trust rather than the quality of government institutions. These interactions need further exploration since they vary across countries and datasets. While support for environmental taxes is found to be relatively high in some developing countries, public aversion towards higher taxes for environmental protection is still relatively high internationally.

Introduction

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[1] This paper is based on the Master thesis: *Trust, values and quality of government. A multilevel cross-country investigation of public support for environmental taxes*, presented at the Department of Political Science, University of Gothenburg in May 2016. Available at: https://gupea.ub.gu.se/handle/2077/44852?locale=sv

Environmental problems in the form of climate change, environmental degradation of air, water and soil, as well as depletion of common pool resources such as fish stocks, timber and coal, are by many scholars perceived to be rooted in social dilemmas, or lack of collective action. Since the costs of polluting activities are shared by everyone collectively, while the benefits are received by each actor individually, there is a strong incentive for individuals to free-ride (or defect). That is, to benefit from emission reductions taken by others, and engage in activities that generate environmental pollution or overuse of natural resources instead of acting pro-environmentally and cooperate for the common good. In other words, the short-term benefits of individuals acting in an environmentally harmful manner tend to outweigh the long-term losses of everyone collectively – restricting cooperative behavior (Olson 1971; Ostrom 1990; Dawes 1980; Kollock 1998). Therefore, some kind of steering instruments from an external authority such as the state are needed since voluntary cooperation is not likely to come about easily (Mansbridge 2014; see also Palfrey & Rosenthal 1984; Saijo & Yamato 1999; Okada 1993; Dixit & Olson 2000).

Today, regular citizens' consumption patterns are argued to be the main sources of pollution responsible for environmental degradation rather than the activities of "big polluters" in the fossil fuel industry (Maniates 2001; Skill 2008; Micheletti 2003; Matti 2009). According to several environmental economists and policy experts, taxes are one of the most efficient policy tools to deal with today's environmental problems and change people's behavior from an economic perspective (Tietenberg 1990; Kallbekken & Aasen 2010; Sterner 2012). These market-based instruments have been advocated by various policy advisors and donors, including international organizations like the World Bank and OECD (OECD 2016) for many years, arguing that environmental taxes are the key to more effective environmental protection in developing countries (Coria & Sterner 2010). Whether such taxes are a suitable solution in different country contexts, and if people in these countries are actually willing to accept and pay higher taxes for environmental protection is one of the main interests of this paper.

Environmental taxes have been proven to work well as policy tools to reduce environmentally harmful behavior in many contexts – particularly in developed countries in the Western and European spheres. However, in many cases environmental taxes are not imposed, and where they are imposed their design often differs from recommendations of economists (Kallbekken & Aasen 2010). There are several important reasons for this; public attitudes are one of them, especially when it comes to taxes that are imposed directly on individuals (Kallbekken 2008). It is important to understand public attitudes towards environmental taxes because in order to design taxes such that they are politically

feasible, they need to be both effective and considered acceptable among the public (Kallbekken & Aasen 2010). While extensive research on public support for green taxes has been conducted mainly in developed countries within the European or Western parts of the world (e.g. Hammar & Jagers 2006; Kallbekken & Sælen 2011; Kallbekken & Aasen 2010; Harring & Jagers 2013; Harring 2014a; Konisky et al. 2008; Clinch & Dunne 2006; Deroubaix & Leveque 2004; Dresner et al. 2006; Jagers & Hammar 2009; Alm & Torgler 2006), there appears to be a lack of comparative research that includes countries outside these contexts (Harring 2016; Kollmann & Reichl 2013; Harring & Lapuente 2016 are a few exceptions).

Given that previous research has shown that corruption, and political and social trust, matters for people's attitudes towards environmental taxes (see e.g. Hammar & Jagers 2006; Harring 2014a; Harring & Jagers 2013; Harring 2013; Kallbekken & Sælen 2011; Kollmann & Reichl 2013), such taxes could be expected not to work as properly in developing countries in Africa, Asia, South America or Latin America where levels of corruption are usually higher. In fact, studies have shown that people in corrupt countries (generating low trust in government and in other people) have a lower tax-morale[2]; causing low compliance with public policies and demands for stricter regulations instead (Frey & Torgler 2007; Aghion et al. 2010). Thus, the level of quality of government appears to matter not only for effective implementation, but also for public demand for state policies before the policies are implemented in the first place.

Environmental taxes may have been efficient in many developed countries, but implementing this category of policy tools in developing countries or emerging economies can meet various obstacles and public resistance for different reasons. While previous research has investigated a range of explanatory factors, including social trust, political trust, economic and political factors, ideological preferences, sense of fairness, environmental concern, values, beliefs and social and personal norms to explain support for green taxes and other climate policies (see Drews & Van den Bergh 2015 for overview), none or at least very few studies have looked at potential interaction effects (Fairbrother 2016 and Harring & Lapuente 2016 are two exceptions). This might be a reason why the existing

[2] A term that is often used when referring to individual's intrinsic willingness to pay taxes (Alm & Torgler 2006).

literature has been unable to identify what factors matter the most in explaining public attitudes towards environmental taxes, and more importantly whether the same factors apply similarly in different country contexts.[3]

Fairbrother (2016), investigating support for environmental protection, finds that the effects of social trust and political trust vary cross-nationally, but does not provide any explanations. By exploring interactions, we can discover whether some factors matter more in certain contexts, and why this is the case. There are theoretical and empirical reasons to believe that the effects of people's values and trust vary across countries, depending on institutional context. In this paper, it is argued that the effects of people's green values and social trust on environmental tax support is contingent on the perceived quality of government (QoG): If people do not trust public authorities to implement taxes in an efficient and uncorrupt manner, they are likely to be less supportive of the taxes despite their pro-environmental values or trust in other people. Exploring these relationships is crucial for the successful and effective implementation of climate policies, if green taxes will be increasingly imposed internationally to enhance climate change mitigation and prevent large-scale environmental degradation. It is also important from a political science perspective since successful policies can increase satisfaction with and trust in political leaders, creating an environment where leaders can succeed (Hetherington 1998).

The aim of this paper is to explore potential interaction effects between individual-level and country-level variables that can contribute to findings from previous research and help explain public support for environmental taxes internationally. Assuming that interactions are possible and that the impacts of individual-level factors are contingent on other individual- or country-level factors, could lead to other conclusions about their importance in different country contexts. Exploring interactions will contribute to broaden our understanding of the effects of factors that have been identified as crucial for public support of environmental taxes including values and trust. Political and social trust have mainly been studied separately in previous research, while people's value orientation has not received much attention in the literature on trust and policy acceptance (Harring & Jager 2013 and Konisky et al. 2008 are two rare exceptions). This paper brings two large literatures together; the environmental psychology literature on values and the political-sociological literature on trust.

[3] Drews and Van den Bergh (2015) refer to the relative importance of factors as a question left unanswered in their review of existing research and highlight that little is known about the effects in other geographical areas and cultural contexts (other than in Europe, North America and Australia).

The overarching research question asked is: Do the effects of values and social trust on public support for environmental taxes vary depending on country context? Specifically, does QoG explain this variation? In order to investigate the contingent effects, data from the Fifth Wave (2005-2009) of the World Values Survey (WVS) and the Survey Environment III (2010) from the International Social Survey Programme (ISSP) is used. These two datasets are used partly as a robustness check to see if we find similar effects, and to be able to investigate whether different operationalizations of the main variables of interest matters for the results. The main interest of the study is not to investigate country effects, rather to see whether differences in individual-level relationships across countries are determined by contextual factors. For these purposes a multilevel analysis approach is used.

The rest of the paper is organized as follows. The second section provides a short background to environmental taxes and the importance of public support. The third section provides the theoretical framework and literature review, leading to the theoretical models and hypotheses. The fourth section discusses the methodological approach, the data and operationalizations of variables. The fifth section discusses the limitations of the study. The sixth section provides the results of the analysis, and in the seventh section the results are analyzed and related to the hypotheses and theoretical models. The final section concludes by returning to the research question and aim of the paper and provides some suggestions for future research.

Environmental taxes and why public support[4] matters

The use of market-based economic instruments such as environmental taxes, permit schemes and subsidies as policy tools to reduce environmentally harmful behavior of both individuals and businesses has been common for the past decades mainly in developed countries around the world, but they have also been implemented in numerous developing countries in Asia, South America, Latin America and most recently in Africa – especially in the form of taxes (Bluffstone 2003; Sterner 2012). These policy instruments are considered to be more efficient than traditional command-and-control measures, such as legislation or coercive regulations, in dealing with environmental degradation and pollution of today (Connelly et al. 2012; see also Tietenberg 1990; Sterner 2012). The latter measures are still considered the dominant tools in environmental policy, while the former are mainly discussed

[4] In this paper, *support* and *acceptance* are used interchangeably. They are defined in terms of attitudes, and partly measured as willingness to pay for environmental protection. An attitude is commonly defined as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken 1993). In this case, it is the evaluation of environmental taxes in general and to what degree people agree or disagree with taxes as policy tools for environmental protection.

in terms of distributional effects and influences on competitiveness in the market (OECD 2006, 2010, in Kollmann & Reichl 2013). It is argued, however, that there has been an increased focus on designing efficient, incentive-based pro-environmental policy tools directly targeted at the behaviors of individuals (Harring 2014b). This is seen as a result of a general shift in interpretation of the responsibility for causes of environmental problems as well as the best way to solve these problems. Economic instruments are often considered a universal solution to environmental collective action problems, and environmental taxes are one such popular solution. However, in many countries their use is still relatively limited (OECD 2016).

An environmental tax or a "green" tax is considered to be a market-based push-strategy aimed at increasing the price of environmentally harmful activities and changing people's behavior. The former is done by internalizing environmental and social costs (externalities) caused by polluting activities into market transactions. As such, green taxes are argued to help correct for the market failures that cause environmental problems by attaching a price to polluting activities, that is equal to the damages caused by these activities (Endres & Radke 2012). The logic behind imposing the tax is that as the price for certain activities increases, people's incentive to change their behavior in a more sustainable direction will also increase (Harring & Jagers 2013; Harring 2014a). The argument, based on economic theory, is that imposing taxes on polluting activities will reduce environmental damage in the most efficient way, by encouraging households and firms that can reduce pollution at the lowest cost to change their behavior (OECD 2010). The efficiency criterion alone might not be a reason enough for policymakers to adopt green taxes, however. It is argued that public preferences towards such policies are at least as important as economic efficiency (Brännlund & Persson 2012).

In many contexts, there has been strong opposition against these kinds of policy tools. In the process of designing policy tools, decision-makers often face a challenge in striking the right balance between what is perceived efficient by policy experts and what is perceived legitimate by the public. Both the level and direction of public support for a certain policy instrument can have major implications for its following performance (Matti 2009). Moreover, unless there is sufficient public support for a suggested policy tool it is not likely to be advocated within the political arena and will therefore fail to be implemented (Page & Shapiro 1983). Thus, policies that reflect public preferences are more likely to become efficient when, or if, they are implemented in practice (Brännlund & Persson 2012). For these very reasons, it is important for policymakers to understand which factors influence public attitudes towards (environmental) policies in general and environmental taxes in particular. This can

help reveal under what conditions taxes are considered legitimate to the public, making them politically feasible (see Kallbekken & Aasen 2011). In some contexts, green taxes may not be politically feasible, however, considering the effects of individual- and country-level factors. Moreover, some economists have argued that green taxes will not work as well in developing countries compared to in developed countries due to institutional and economic constraints limiting the ability of regulators to monitor compliance and/or punish violations of imposed measures (Blackman & Harrington 2000; Bell & Russell 2002, in Coria et al. 2011).

Theoretical framework and literature review

Social dilemmas and willingness to pay taxes for environmental protection

Environmental protection, or the provision of a clean and healthy environment, is considered a public good and can be described in terms of *first-order* and *second-order* social dilemmas or free-riding problems (Ostrom 1998; Kollock 1998; Berigan & Irwin 2011; Oliver 1980; Yamagishi 1986; Okada 2008). The first-order dilemma occurs when individuals choose not to cooperate and solve the public good provision problem and engage in activities that are harmful to the environment instead. Voluntary actions that will provide for environmental protection are not likely, particularly in large-scale collective action dilemmas, and those actions that are taken by individuals, households and firms are not adequate, since they will undersupply pollution abatement if the individual costs of such efforts exceed the benefits enjoyed by themselves and others (Fairbrother 2016). In order to induce actors to undertake more substantial efforts, organized coordination or sanctioning systems provided by a third, external party such as the government is needed. Implementing policies aimed at changing actors' behavior and overcoming the original social dilemma can cause a second-order social dilemma. The second-order dilemma occurs when individuals refuse to comply with policies or sanctioning systems imposed by the state. If the sanctions or costs of non-compliance are low, actors might choose to enjoy the collective benefits while simultaneously ignoring to pay a tax or comply with a set regulation (Harring 2014b).

This division between first-order and second-order dilemmas is captured by Ostrom's (1990) concept *polycentrism*, saying that decision-making by individuals at the local level needs to be "nested" within state structures at a higher level. This higher level provides the necessary tools or resources to make local negotiations on common-pool resources efficient. State action at the higher level is argued to be an often necessary solution to complex collective action problems, including the provision of

public goods.[5] One of the state functions is to threaten to impose a solution if local negotiating parties fail to reach an agreement. Mansbridge (2014) takes things a step further by arguing that today there is a need for state-like overarching institutions at the international level, due to issues such as climate change and environmental degradation taking place at large scales. These overarching institutions should, according to Mansbridge, provide state-like functions to facilitate efficient cooperation on a level where one state with legitimate coercion power does not exist. The take-home point is that voluntary cooperation to protect the environment is not likely to come about easily, rather some kind of strong external authority is needed.

From an individual's perspective, costly abatement efforts are only meaningful when they are outweighed by equivalent contributions made by others, but such contributions can never be guaranteed. Instead of taking part in collective actions for environmental protection actors, including individuals, firms and households, might choose to cheat through violating costly regulations or avoid paying a pollution tax (UNEP 2004, in Fairbrother 2016). So why then would individuals, or other actors, be willing to pay taxes to provide a public good despite it (i.e. environmental protection) being costly to them? Contrary to the beliefs of rational-choice theorists that individuals' actions are motivated purely by their own self-interests, others have argued that individuals are not self-interested but rather strong reciprocators (Fehr et al. 2002; Gintis 2000; Gintis et al. 2003). They are willing to sacrifice resources in order to be kind to those who are being kind and to punish those who do not obey by the rules and being unkind. The former is referred to as "strong positive reciprocity" and the latter is referred to as "strong negative reciprocity". Assuming that most people are strong positive reciprocators, we might come to understand why people are willing to pay higher taxes to provide a public good even if it is costly to them. The benefits provided to participants of any system that is designed for protecting the environment will depend on the probability of compliance by others, which in turn will depend partly on the quality of how the system is being enforced (Fairbrother 2016). Put differently, individuals will pay taxes for environmental protection if they believe that other individuals will pay their fair share (i.e. if the level of social trust is high), and if they believe that the taxes will be managed efficiently and fairly by the government implementing the taxes (i.e. if the level of political trust is high) (Scholz & Lubell 1998; Svallfors 2013).[6]

[5] This is Mansbridge's (2014) interpretation of Ostrom's argument about state action.

[6] Important to note is that Scholz and Lubell, and Svallfors (and Rothstein and Uslaner 2005 below) discuss tax compliance or support for taxes in general, and not compliance with environmental taxes specifically.

The problem of a second-order dilemma could be considered to be more severe in countries where levels of social trust is low and taxes can be more easily evaded, that is, where levels of QoG are low. In a country like Sweden, for example, where the level of QoG is high it would be nearly impossible for people to cheat on fuel taxes and other taxes related to consumption patterns considering how the tax-system is designed and enforced. If there is low social trust in these contexts people might demand more policies since they believe in the state capacity to enforce the tax-system and punish free-riders. In high QoG countries, it is more likely that people will comply with imposed policies and that implementing authorities will provide something good by, for example, putting the revenues from taxes to their rightful use. In low QoG countries, on the other hand, this is less likely largely because of high corruption levels. Moreover, economic and institutional constraints in these countries can contribute to overall poor enforcement of tax-systems by government authorities. Investigating public support for environmental taxes in low QoG countries is of crucial importance since the implementation of bad reforms in these contexts can result in even more corruption (e.g. Damania 2002).

The context or social structure in which people live has been argued to be crucially important for people's tendency to engage in cooperation or not, and it can be argued to be of similar importance when it comes to policy acceptance. To get the support of individuals to pay taxes for environmental protection, there is a need for relatively high levels of both social trust and political trust in the societies they live in (Scholz & Lubell 1998; Rothstein & Uslaner 2005). I will elaborate further on both these types of trust, and the importance of people's values, in the following sub-sections. At this point it is enough to say that reciprocity, social trust, and political trust (including confidence in government quality) appear to be important incentives for individuals to refrain from free-riding and engage in cooperative behavior, as well as to comply with taxes for environmental protection.

Previous research: theories, findings and shortcomings

In this section, the theories on the importance of social trust, political trust and people's value orientation for public acceptance of green taxes are discussed, and some findings of previous research presented. In addition, gaps in existing research are identified that open up for more elaborate studies on the effects of values and social trust in relation to QoG.

Social trust as a determining factor of public support and QoG

Generalized social trust in other people, or interpersonal trust, is considered an important factor in order for people to solve collective action problems and engage in cooperative behavior (Ostrom 1998), as well as for people's willingness to comply with different policy measures aimed at dealing with collective action problems (Janoski 1998; Uslaner 2003, in Hammar & Jagers 2006). Sønderskov (2009) argues that generalized social trust[7] helps in solving large-scale collective action problems, since people's propensity to cooperate largely depends on whether they trust most other actors involved in the social dilemma to cooperate as well. Testing the theory his analysis shows that generalized social trust has a strong positive effect on public good provision, but not in a joint product situation[8], indicating that social trust enhances cooperation in collective action dilemmas in particular. If people in fact decided to act collectively and protect the environment from polluting activities, there would be no need for government intervention and less need for different policies such as taxes to try to change people's behavior. Social trust can thereby indirectly explain attitudes towards environmental policy instruments, since they impact actions taken collectively by individuals to protect the environment (Harring 2014b). If people cannot agree to act collectively, or if they do not trust most other actors to cooperate for the common good, they are likely to support some kind of policy instrument that is imposed by the state.

While low trust in others to cooperate and engage in activities for environmental protection could generate demand for environmental taxes, low social trust in others to comply with the taxes generates less support for taxes. If people feel that their fellow citizens are dishonest and do not believe that other people will comply with an environmental tax, they are less likely to support such a tax (Harring & Jagers 2013). Hammar and others (2009), for example, find in their study that people's tendency to accept higher taxes for environmental protection depends on the degree to which tax-evasion is possible. The more difficult it is to escape from paying the taxes, the more willing people are to accept them. This leads us to the importance of QoG and its relationship with social trust and collective action. QoG is argued to generate trust (social and political trust) and hence, cooperation. Some argue that citizens trust each other since they perceive the state as a credible enforcer of contracts (e.g. Offe 1999; see also Levi & Stoker 2000). Others argue that citizens who perceive public

[7] Refers to trust in people one does not generally know (i.e. not trust in friends, family members or relatives).

[8] Sønderskov tests his hypothesis that generalized social trust has a larger effect in collective action dilemmas which involve a *pure* public good (recycling), against a joint product situation (consumption of organic foods) that involves both private and public benefits.

employees as trustworthy also believe that most people are trustworthy (e.g. Rothstein & Stolle 2008). QoG implies that public authorities such as courts and the police will enforce government law incorruptly, impartially and efficiently. As such, the risk of being cheated by others will be lower, since people believe in the competence of public institutions to punish those who try to cheat while loopholes within the system (allowing for tax-evasion and corrupt practices) are minimized, which in turn increases trust. It has been shown by, for example, Hammar and others that the lower trust people have in their fellow citizens, the stronger is their belief that taxes are being systematically evaded (Hammar et al. 2009).

From this, we can expect people with higher social trust to be more supportive of higher taxes to protect the environment, but we could also ask whether social trust has different effects in different country contexts. That is, in contexts with varying levels of QoG. Keeping in mind that QoG is believed to generate higher levels of social and political trust, it could also be argued that the effect of social trust on public support for green taxes is contingent on the quality of government institutions. Aghion et al. (2010), for example, show that people living in corrupt countries are more likely to support strict legal regulations, which is explained by a lack of trust in other actors to voluntary contribute to public goods provision. It is reasonable to believe that the same applies to environmental taxes; people with low levels of social trust will demand more taxes only in high QoG countries where the state is perceived as a credible enforcer (D'Arcy & Nistotskaya 2013). In contexts with low social trust they are more likely to support strict legal environmental regulations instead.

A different interaction effect could also exist when it comes to acceptance of green taxes. I would argue that social trust will have a stronger positive effect on public support for green taxes in high QoG countries. Instead of demanding regulations people will be more open to taxes, due to higher levels of social and political trust (see next sub-section). People who live in countries with low levels of QoG or trust in implementing institutions are not likely to be supportive of higher taxes to protect the environment, since they can believe that tax-revenues will be wasted or stolen following corrupt practices, or that the tax-system has been designed with loopholes allowing for tax-evasion or unfair tax-loadings (Fairbrother 2016). If this is the case, people's general trust in others should not even matter because even if they trust others to comply with the taxes the money can still be wasted by corrupt and unreliable government officials. From this, we would expect social trust to have a stronger positive effect on public support for environmental taxes in countries with high levels of QoG.

Political and institutional trust[9] as a determining factor of public support and QoG

The way people perceive political institutions that implement policies to steer their behavior is important for all kinds of pro-environmental policy instruments used, regardless of whether it concerns regulations, information or economic incentives (Harring 2014a). Although people might have very strong green sympathies or concern for the environment, they can still choose to refuse to accept pro-environmental policy instruments. People's attitudes towards political steering and their view of the authorities that are implementing the specific policy instrument also matter for people's willingness to accept pro-environmental, political initiatives (Hammar & Jagers 2006; Harring & Jagers 2013). There is an extensive literature on how political trust, or QoG, affects public support for state intervention where it is argued that people's perceptions of public officials as uncorrupt, efficient and fair explains attitudes towards redistribution, taxes and government spending (Svallfors 2013; Hetherington 1998; Scholz & Lubell 1998; Rothstein et al. 2012; Rudolph & Evans 2005).

Svallfors (2013), investigating attitudes towards higher taxes and government spending, finds that people's perceptions of the effectiveness and fairness of government officials has a strong independent effect on such attitudes. He shows that support for welfare and redistribution policies is stronger in countries with high levels of QoG. People who live in societies with low levels of QoG, however, may not believe that the government and public administration have the capacity or necessary bureaucratic discretion required to carry out certain policies or reforms. It is argued that policies requiring more bureaucratic discretion and government capacity, such as complex market-based policy tools (including taxes), are less likely to be imposed by governments in corrupt countries, partly since the level of QoG affects public support for these policies (Dahlström et al. 2013). At low levels of QoG, people might be unsure of how revenues will be spent or believe that they will be wasted due to inefficiency and corrupt practices. This, following how the issue is framed, can be related to political trust or institutional trust at the individual level or perceptions of QoG at the country level.

Market-based policies and reforms in particular have been argued to be contingent on rule-based and well-functioning bureaucracies, in order to build trust between various actors (e.g. individuals and businesses) and to enhance the predictability in market transactions (Pierre & Rothstein 2011). Furthermore, it has been argued that unless there is a rule-based, trustworthy public administration in

[9] Institutional trust is defined as trust in the effectiveness and fairness of public institutions (Rothstein 2005) and is used interchangeably with the term political trust in this paper.

place, people will not support implementation of taxes[10] despite their strong pro-environmental beliefs (Harring 2014b). For example, people might believe that public administrators engage in arbitrary enforcement and impose greater compliance costs on some polluters, but not on others. Policymakers could also have designed a system that allows certain individuals to escape their tax-obligations, or they might end up using tax-revenues for corrupt practices instead (Fairbrother 2016). Research has to some extent confirmed these arguments by showing that corrupt political institutions generate aversion towards economic incentives (e.g. Harring 2016), and several studies have found that in countries with corrupt and inefficient public institutions there is a strong demand for regulations instead (Aghion et al. 2010; Di Tella & MacCulloch 2009; Dimitrova-Grajzl et al. 2011; Pinotti 2011). In this case, people's desire to punish free-riders with regulations that are strong and coercive seems to outweigh concern about public officials being corrupt.

Other research shows that there will be less aversion towards market-based instruments and redistributive policies if the state is perceived as a credible enforcer. This will make the need for regulations smaller and open up for more complex policies such as taxes, since the ability of the state to punish possible free-riders is considered credible (i.e. free-riding is less likely) and political trust and social trust is higher (D'Arcy & Nistotskaya 2013).[11] From this, we would expect people in high QoG countries to be more supportive of taxes for environmental protection, due to generally higher levels of political and social trust in these societies.

The importance of political trust for public attitudes towards environmental policy tools has been confirmed by the findings in many studies that have looked at public attitudes towards market-based policy instruments, including taxes (e.g. Hammar & Jagers 2006; Hammar et al. 2009; Harring & Jagers 2013; Kallbekken & Aasen 2010; Kallbekken et al. 2013; Kallbekken & Sælen 2011; Deroubaix & Leveque 2004; Dresner et al. 2006; Clinch & Dune 2006; Matti 2009; Kollmann & Reichl 2013; Fairbrother 2016). These studies have found that people with higher levels of political trust are generally more supportive of environmental taxes. If people do not believe in the competence of politicians to recognize whether taxes are the right option for climate change mitigation, or if they question whether revenues from taxes will be spent in an effective and appropriate manner, they will not be

[10] Or other *market-based or redistributive policies,* as is explicitly stated by Harring (2014b).

[11] One usual assumption is that in countries where levels of QoG are high, social and political trust is also high. The latter two are often considered to be a product of QoG, while a few scholars have argued for the reverse.

able to accept an increase in taxes to protect the environment (Hammar & Jagers 2006, in Harring & Jagers 2013).

Pro-environmental values[12] as a determining factor of public support and QoG

There is an existing literature on people's value orientation that has received attention from several scholars when trying to explain the acceptance of environmental policy instruments. This particular branch of research usually departs from Schwartz's value scheme (Schwartz 1992), from which the value-belief-norm (VBN) theory or chain has developed (Stern et al. 1999), or Inglehart's post-materialist values scale (Inglehart 1995).

Scholars in previous research have measured people's values using Schwartz's value scheme as part of capturing the components of the VBN chain. The VBN theory has mainly been used within the field of environmental psychology, to help explain people's general environmental attitudes or behaviors, why they join environmental movements, concerns for environmental problems, and their willingness to make sacrifices for environmental protection (Hansla et al. 2008; Poortinga et al. 2004; Stern et al. 1999; Schultz & Zelezny 1999). Following the VBN theory[13], scholars have argued that holding different values (e.g. egoistic or altruistic values) creates certain beliefs about environmental conditions that affect the formation of attitudes in general and attitudes towards environmental policy tools. Supportive evidence of the theory can be found in many studies focusing on various pro-environmental actions, including pro-environmental policy acceptance (e.g. Schuitema et al. 2011; Steg et al. 2005; Hansla et al. 2013; Eriksson et al. 2006).

Other scholars have measured people's values using Inglehart's post-materialist values scale[14] (Kidd & Lee 1997; Franzen & Meyer 2010; Gelissen 2007; Inglehart 1995; see also Brechin & Kempton 1997; Dunlap & Mertig 1997; Abramson 1997; Pierce 1997). It is assumed that values affect people's general environmental concern, and therefore their acceptance of pro-environmental policy tools. This literature takes the distinction made between materialist and post-materialist values as a point of departure. The former emphasize economic well-being and national security, and the latter emphasize quality of life and self-expression as important for a society (Stern et al. 1999). The theory of post-

[12] Refers to post-materialist values, and is used interchangeably with *environmental values* in this paper.

[13] See, for example, Stern (1999) to learn more about the VBN theory.

[14] The post-materialist scale has not been used to measure values in relation to the VBN theory.

materialism holds that post-materialist political and social values and attitudes have emerged in industrialized (Western or European) countries, resulting from an increase in affluence and security. According to Inglehart, people (or initially generations) have developed different values that can be explained by their life experiences. Those who have experienced material insecurity develop materialist values, and those who have not develop post-materialist values or priorities like environmental protection (Inglehart 1971, 1977). While it is important to highlight that increased post-materialism in societies is not only about development of pro-environmental values[15], post-materialist values have been found to be directly related to support for environmental protection internationally, measured as willingness to make economic sacrifices for the environment (Gelissen 2007).

Values can be considered as the root of people's attitudes. Attitudes are formed through people's personal norms, which in turn can be seen as derived from environmental values (Nordlund & Garvill 2002). From these values certain beliefs about environmental conditions are created, which can affect people's attitudes towards environmental taxes.[16] The existing literature has not looked at potential interactions when evaluating this effect, however. It could be argued that the effect of values on public support for taxes varies across country contexts.[17] Svallfors (2013), investigating public attitudes towards higher taxes and government spending, finds that the effects of people's egalitarian values (i.e. their beliefs in equality for all people) is contingent on perceived effectiveness and fairness of government institutions. He shows that the effect of such values is stronger in countries with high levels of QoG, and that people with egalitarian values are generally more supportive of higher taxes and spending. At low levels of QoG, his study shows that people with egalitarian values in some cases want lower taxes than people with less egalitarian values. That is, people with egalitarian values that are usually supportive of welfare and distribution policies are not prepared to support such policies if they live in low QoG societies.

If the same holds true for people's pro-environmental values, we can expect the positive effect of post-materialist values to be stronger in countries with high levels of QoG. We could also expect people with green values to support environmental taxes only if there is a trustworthy public administration in place. As indicated by Svallfors study, and translated to this context, green values could

[15] It also affects, for example, political tolerance, racial attitudes and political participation (see Davis 2000).

[16] Environmental values are considered to be linked to altruistic values, and contrary to egoistic values. People holding altruistic or environmental values are expected to be more positive towards such policy instruments.

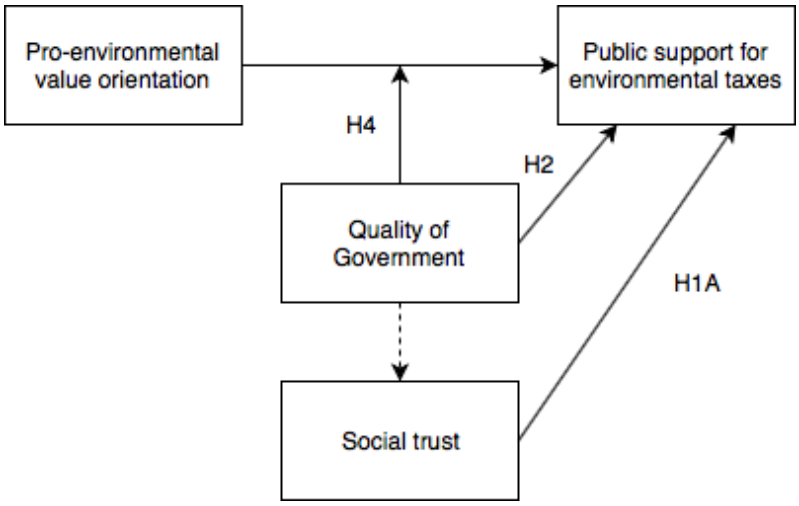
[17] Pierce (1997), for example, stresses the importance of taking into account political culture within countries when evaluating the effect of post-materialist values on environmental concern.

have a negative effect on public support for environmental taxes in low QoG contexts. In this case, QoG would be expected to convert green values into support.

Theoretical models and hypotheses

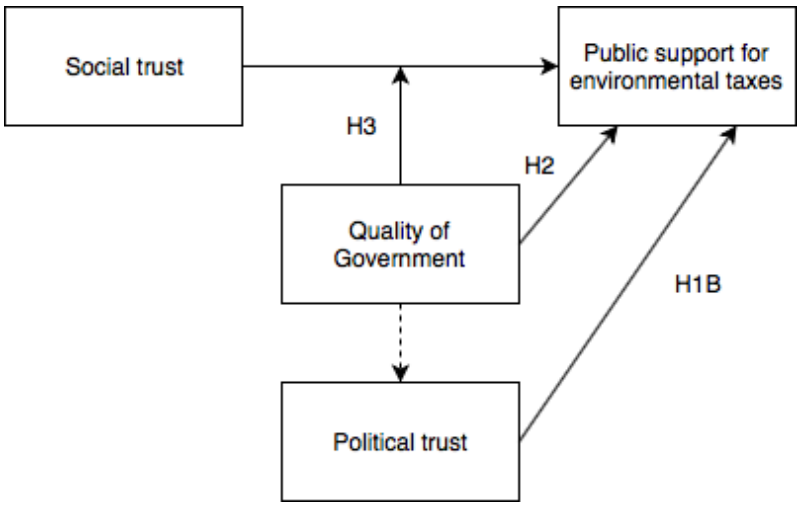
The literature review and theoretical discussion above highlights the possibility of interaction effects. Based on the findings in previous research and theoretical arguments, we could expect the effects of social trust and values to vary across country contexts. That is, across countries with varying levels of QoG. QoG is suggested to be a moderator that impacts the relationship between pro-environmental values and public support for environmental taxes. QoG is also expected to moderate the impact of social trust on environmental tax support. Political and social trust are assumed to be affected by QoG, and they are all expected to have direct effects on public support for environmental taxes. The relationships are illustrated in figures 1 and 2.

FIGURE 1. PRO-ENVIRONMENTAL VALUES, QOG, SOCIAL TRUST AND ENVIRONMENTAL TAX SUPPORT.



Note: the figure shows the moderating effect of QoG on the link between pro-environmental value orientation and public support for environmental taxes, and the direct effects of social trust and QoG on environmental tax support.

FIGURE 2. SOCIAL TRUST, QOG, POLITICAL TRUST AND ENVIRONMENTAL TAX SUPPORT.



Note: the figure shows the moderating effect of QoG on the link between social trust and public support for environmental taxes, and the direct effects of political trust and QoG on environmental tax support.

From the two theoretical models, four hypotheses can be derived.

$H_{1(A)}$: Individuals with high levels of social trust are generally more supportive of higher taxes to protect the environment than individuals with low social trust.

$H_{1(B)}$: Individuals with high levels of political trust are generally more supportive of higher taxes to protect the environment than individuals with low political trust.

H_2: Individuals living in countries with high levels of QoG are generally more supportive of higher taxes to protect the environment than individuals in countries with low levels of QoG.

H_3: The positive effect of social trust on public support for environmental taxes is stronger in countries with high levels of QoG.

H_4: The positive effect of pro-environmental values on public support for environmental taxes is stronger in countries with high levels of QoG.

The first hypothesis has been tested by several scholars in previous research, but it is rarely shown whether the same effects hold across a range of country contexts internationally. In relation to the first hypothesis, a second hypothesis is derived. Keeping in mind the relation between QoG and trust, people living in high QoG countries can be expected to be generally more supportive of environmental taxes. The third hypothesis concerns the contingent effect of social trust and as theorized this effect may depend on the perceived quality of government institutions. Taking Svallfors (2013)

as a main point of departure, the fourth hypothesis on the contingent effect of values can be derived. As suggested by his findings, and translated to this context, green values can be expected to have a stronger effect in high QoG countries. It was also suggested that green values could have a negative effect on low levels of QoG, but at this point there is not enough theoretical and empirical reason to derive such a hypothesis.

The main contribution of this paper is the exploration of interaction effects. Thus, the main interest is the effects of values and social trust on public support for environmental taxes in relation to QoG. I do not intend to investigate the effects of QoG on trust (the dotted arrows in figures 1 and 2); I simply assume that a causal link exists. I will, however, investigate both the effects of QoG and political trust when testing H_3 and H_4 to see if it produces different results.

Methodology, data and measures

Method: Multilevel analysis

In order to test the main research hypotheses, I need to take into account two levels of analysis – the first level being individuals and the second being country context – to see if the effect of individual qualities are contingent on country-level factors. This cannot be done using normal OLS regression and calls for a hierarchical regression model. Hierarchical regression models or multilevel analysis should be used when the data is nested or has a hierarchical structure, as in this case, where individuals are considered to be nested within countries.[18] If clustering of individuals is ignored, there is a risk that estimated regression parameters and standard errors will be biased (Guo & Zhao 2000; Hox 2002), usually causing underestimated standard errors and overestimated significance levels (Allison 2009, in Svallfors 2013).

To see whether there is clustering within countries, or if country context has had an effect on individual-level characteristics, we need to study the intraclass correlation coefficient (ICC). The ICC helps estimate the nested effect, that is, the dependency in the data, by exploring within and between country variance. For the ISSP dataset, the variance that exists between countries in public support for higher taxes to protect the environment is estimated to 5.8%, and for the WVS dataset to 8.1%.

[18] The units of analysis in this study are individuals living in different country contexts.

This means that about 5% and 8 % respectively of the total variation in public support for environmental taxes is between countries and can be explained by country specific effects at the higher level.[19] There appears to be greater variance between individuals *within* countries than between countries, but the cross-country variation in both datasets is still large enough for a multilevel analysis to be meaningful.

Multilevel analysis is suitable in this case since it allows us to take into account the fact that individuals are embedded in different country contexts, and to deal with dependence in errors. Individuals sampled from one country could be affected by factors in that particular context, providing them with similar patterns of behaviors and attitudes – different from individuals in other countries. Previous research on cross-country differences in support for environmental protection and attitudes towards environmental policy instruments shows that such contextual effects or clustering of individuals within countries exists (e.g. Aghion et al. 2010; Harring 2014a; Franzen & Meyer 2010). One advantage with using multilevel analysis is that we can allow regression parameters to vary, including intercepts and slopes of variables. This method thus allows us to assume that countries have different starting points in the level of support for environmental taxes (random intercepts), and that the effects of different predictors (in this case, values and social trust) might vary across countries (random slopes). To model the latter variation, interaction terms are used in the multilevel regression models to try to explain these varying effects. The main benefit of using this method, applying hierarchical models, is that it allows us to investigate interactions between individual-level qualities and contextual factors, which is necessary to test H_3 and H_4.

Provided that measures of the dependent variable used in this study are categorical, containing more than two ordered categories, and that there is a possibility that the distances between the categories vary, a multilevel *logistic* regression analysis is perhaps a more suitable method to use (Harring 2014a; Fairbrother 2016; Harring & Lapuente 2016). However, this would make the interpretation of interaction terms difficult. As an initial test, this study therefore applies an ordinary multilevel analysis approach, treating the categorical dependent variable as a continuous variable.[20] Yet, this comes at the cost of making the interpretation of the outcome variable more difficult, since we have to make

[19] The rest of the contextual-level variation is explained by individual-level factors.

[20] With at least five categories, and symmetrically distributed observations, the bias introduced by treating a categorical variable as continuous is small (Bollen & Barb 1981; Johnson & Creech 1983, in Hox et al. 2010). With four or fewer categories regression parameters and standard errors usually have a downward bias.

a rather arbitrary decision about at what point on this new scale aversion towards green taxes turns into support.

Data

To investigate cross-level interactions of individual characteristics and country characteristics, we need to have more than 20 contexts at the higher-level variable (in this case countries), and the group sizes (i.e. the number of individuals living in each country) should not be too small (Kreft & de Leeuw 1998). Using data from the survey Environment III by the ISSP, we have a sample of 26 countries with 14479 respondents (with answers on all variables included in the analysis). In this sample, 22 countries belong to the European or Western spheres, while only four countries can be considered to be outside these contexts (South Africa, Philippines, Chile and South Korea). The data from the Fifth Wave of the WVS includes 32 countries and 26374 individuals.[21] Exactly one half of the countries (16) can be considered as Western or European country contexts, while the other half covers countries outside these contexts. Considering the scopes of both datasets, a multilevel analysis is meaningful and can be performed. Testing the models in this paper on both datasets acts like a robustness check and strengthens our ability to test if the explanations of public support for green taxes from previous research hold across various country contexts.

The data from the ISSP was collected in 2010 through self-completion questionnaires or face-to-face interviews, or both. The dataset originally includes answers from 45199 individuals on survey questions related to people's personal views on environmental issues and the degrees of environmental concern, as well as trust in politicians, government and other people. The data from the WVS was collected using face-to-face interviews during the time period 2005-2009, covering a number of topics including the environment, politics and society. The WVS conducts nationally representative surveys in almost 100 countries containing close to 90% of the world's population, using a common questionnaire to capture people's beliefs and values in life. The advantage of the WVS data over the ISSP data is that it covers a broader number of countries; using both datasets thus gives a wider representation of countries from different contexts. One advantage of the ISSP survey is its specific focus on measuring attitudes related to the environment, whereas the WVS survey measures attitudes and values across many different areas, trying to capture "large trends".

[21] For complete lists of countries and number of respondents see Appendix C.

There are enough survey questions in the ISSP and WVS datasets to capture the individual-level variables of interest. To capture country-level variables, these datasets were merged with the QoG Basic Cross-Section Data (2015). The availability of survey questions in the ISSP and WVS data, makes it is possible to measure the main independent variables using different indicators to see if differing operationalizations affects the results of the analyses. The WVS has in some respects "better" indicators, at least when it comes to measuring political trust. Apart from that, the same indicators can be found in both datasets. Important to highlight is that the paper will not discuss which measures are the "best" ones to use, based on the results of the analyses. The operationalization of variables is outlined and discussed next, along with the motivations of why these particular measures and variables were included. What should be evident from this discussion is that there are no perfect measures, and that in some cases we have to use the best measures or proxies available in existing datasets.

Operationalization of variables

Dependent variable

The dependent variable in this study is public support for environmental taxes, measured as support for higher taxes to protect the environment. Two different survey questions from the ISSP and WVS datasets are used to capture this variable: "How willing would you be to pay much higher taxes in order to protect the environment?" with responses ranging from "very unwilling" (1) to "very willing" (5), from the ISSP, and "I would agree to an increase in taxes if the extra money were used to prevent environmental pollution"[22] with responses ranging from "strongly disagree" (1) to "strongly agree" (4), from the WVS. The former of the two survey questions has a clear reference to current tax-levels. This is true for the latter as well, but it also refers to a dramatic increase in current tax-levels by asking for willingness to pay *much* higher taxes. Furthermore, the latter survey question could be capturing opinions that someone else should pay the taxes. These small differences in nuance between the two survey questions could potentially affect the outcome.[23] In any case, controls for current tax-levels are needed, mainly because the survey questions used to capture this variable are relativistic; they

[22] Similarly to Svallfors (2013), using willingness to provide existing institutions with resources to redistribute.

[23] Research shows that one word in a survey question is enough to make a difference in the outcome, but the difference here should be viewed as a strength since we are testing different operationalizations of variables.

depend on current tax-levels of individual countries. To make them comparable I include a country-level control for current tax-level.

Since the variable is treated as continuous, we have to make a decision about on what point at the scale opposition against green taxes turns into support. The most reasonable "cut point" would be the value on each scale where individuals explicitly state that they *agree* with an increase in taxes, or are *willing* to pay higher taxes for environmental protection. In the WVS data values ≥3 should indicate support and in the ISSP data values ≥4 should indicate support. An alternative cut point would be right in the middle of each scale; 2.5 in WVS data and 3 ("neither willing nor unwilling") in the ISSP data, but this would provide for a less accurate picture. In contrast to previous research, the survey questions are used as concrete measures of support for green taxes.[24] There have been various uses of these questions before, including measuring general support for environmental policy, willingness to make economic sacrifices for the environment and willingness to pay for environmental protection. I believe that they can be used to measure support for environmental taxes specifically, that is, a specific type of government intervention, considering the clear reference to taxes. One could ask whether they really measure support for taxes, but they are still the best measures available.

An alternative measure from the WVS (without a reference to taxes) was considered: "The government should reduce environmental pollution, but it should not cost me any money".[25] Generally, environmental taxes impose higher costs on individuals, even if they often come with promises of reductions in other taxes to level out any extra costs. This particular question has been used in previous research to measure support for environmental state intervention, capturing attitudes that the government is responsible for environmental protection (Harring & Lapuente 2016). The survey question from the WVS used in this paper captures a shared responsibility and attitudes towards a policy imposing individual costs and risks of free-riding (ibid). Since the main interest in this study is not to capture people's attitudes on government responsibility, I believe that the alternative question would be a poor fit for what we are trying to measure. The two survey questions that have been chosen here are more appropriate to measure support for green taxes, because both are stated in a sense that captures the second-order, free-riding dilemma of complying with an imposed policy.

[24] Kollmann and Reichl (2013) are one exception, using the same survey question from the ISSP to measure acceptance of environmental taxes.

[25] If assuming that a respondent who agrees with the statement implies tax aversion.

Independent variables

Political trust

To measure political trust various survey questions have been used by scholars in previous research to explain attitudes towards environmental policy instruments, but most common are measures of trust in "politicians", "the government" or "the parliament" (see Harring & Jagers 2013; Hammar & Jagers 2006; Konisky et al. 2008; Kollmann & Reichl 2013). For example, one could ask people to state how much confidence they have in the government in their nation's capital, with responses ranging from "a great deal of confidence" to "none at all".[26] As has been argued, however, (Harring & Lapuente 2016) political trust is a difficult concept to measure since it can imply many different things; for example national pride or support for the current political party in office (Levi & Stoker 2000), or trust in implementing authorities or the quality of government institutions (Rothstein & Stolle 2008). Moreover, trust in implementing institutions has been argued to be considerably different from trust in representative institutions, including "the government", "political parties" or "the parliament".

The main interest in this study is to capture trust in implementing authorities, and whether individuals believe that environmental taxes will be managed in an efficient, fair and non-corrupt (i.e. impartial) manner. It has been claimed that trust in implementing institutions is less dependent on things like partisanship and captures perceived quality of public institutions instead (ibid). Following Harring and Lapuente (2016), this study uses an index that combines three measures (index 1)[27] in order to capture political trust defined as trust in implementing institutions: "confidence in the police", "confidence in the justice system", and "confidence in the civil services" (Cronbach's alpha: 0.773) from the WVS. For each of the survey questions, respondent answers range from "none at all" (1) to "a great deal of confidence" (4). Since the enforcement of a tax-system will depend on all three of these public institutions, I believe that this index is the best suitable measure of political trust considering available data. To see whether the outcome differs when a different operationalization is used, an index combining trust in government, parliament and political parties (Cronbach's alpha: 0.843) is also used (index 2).[28] For both these indexes higher scores indicate higher political trust.

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[26] This survey question is available in e.g. the Fifth Wave of the WVS.

[27] There is a weak correlation (0.23) between this index and QoG.

[28] There is no correlation (0.01) between this index and QoG.

To capture political trust using the ISSP dataset two measures are combined representing the common way of measuring political trust: "Most politicians are in politics only for what they can get out of it personally", with responses ranging from "agree strongly" (1) to "disagree strongly" (5), and "Most of the time we can trust people in government to do what is right", with responses ranging from "disagree strongly" (1) to "agree strongly" (5). High scores on this index (Cronbach's alpha: 0.497) indicate high levels of political trust. It has been argued that the measure of trust in people in government might unintentionally capture trust in the current government, whereas trust in politicians captures trust in political representatives in general and has been shown to be much more highly correlated with QoG (Harring 2016). In this study, political trust is defined as trust in implementing institutions and perceptions of these as uncorrupt, efficient and fair, which is closely related to QoG. Therefore, a different measure of political trust only including trust in politicians is also used.

Social trust

To measure social trust, defined as trust in people one does not generally know, there are two options. The first option is: "Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?". Respondents can position themselves on a scale ranging from "would take advantage" (1) to "try to be fair" (10). Despite this particular operationalization of social trust being criticized (e.g. Thöni et al. 2012) it is considered an established way of measuring social trust (Harring & Lapuente 2016). According to others (Gächter et al. 2004) this is a better measure of actual trust and cooperative behavior, than the commonly used trust question. This is the second option: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?", with responses ranging from "you can't be too careful" (1) to "most people can be trusted" (5). Since both these measures of social trust have been criticized, both are used in this study to see if a different operationalization affects the results. For the analysis with the WVS dataset I use the established measure of whether people would take advantage or try to be fair, while from the ISSP dataset I use the common trust question. In addition, following Harring (2015), a combination of both these measures is used when analyzing ISSP data. This index was proven reliable (Cronbach's alpha: 0.703). The same index was created with WVS data, but it was proven unreliable (Cronbach's alpha: 0.362) and is therefore not used. All different measures of political and social trust were centered and standardized, to help reduce correlations between the interaction terms and their component variables, and to allow for comparisons of covariances across the two datasets. Comparisons should still be done with caution since the dependent variable is measured slightly differently.

Pro-environmental value orientation

To capture value orientation, scholars in previous research have used either Schwartz's value scheme, as part of capturing the components of the VBN chain, or Inglehart's post-materialist values scale. Both Schwartz's value scheme and Inglehart's post-materialist values scale have been used to explain attitudes towards environmental policy instruments – measuring people's pro-environmental values. In this study, the latter measure is used. The post-materialist value scales from both the WVS and ISSP data consist of four items, where respondents are asked to state what two issues should be the most important for their country. In the WVS, those who selected "giving people more say in important government decisions" and "protecting freedom of speech" are coded as having post-materialist values (2), while those who selected "maintaining order in the nation" and "fighting rising prices" are coded as having materialist values (0). Those who selected one materialist and one post-materialist item are coded as "mixed" (1). The data from two sub-questions in the ISSP survey was added into one variable to get the same structure in response categories, following the same classification criteria.

Quality of Government

To capture the level of QoG in a country there are several different measures that have been used in previous research. In this study, at least when it comes to QoG as a moderator in the hypothesized relationships, the main interest is the level of *perceived* QoG. This could be captured by political trust at the individual-level measuring trust in implementing institutions and thus also the belief in their fair, efficient and impartial performance. Alternatively, it can be captured with the International Country Risk Guide (ICRG) indicator of QoG consisting of three variables: "Corruption", "Law and Order" and "Bureaucracy Quality".[29] This measure of QoG is highly correlated with Transparency International's Corruption Perceptions Index (CPI) (Svensson 2005) and has been shown to produce similar results as both the CPI and the World Bank Estimate of Government Efficiency (WBE). Svallfors (2013) has found strong correlations between public perceptions of QoG and these (mainly) expert-based measures. The measures available on the individual level for this study are not enough to capture people's perceptions of QoG in a similar way (see Svallfors 2013); the closest being trust

[29] "Corruption" measures corruption within the political system. "Law" is a sub-component measuring the strength and impartiality of the legal system, whereas "Order" is a sub-component measuring popular observance of the law. "Bureaucracy Quality" measures the strength and expertise of the bureaucracy to govern without interruptions in government services or drastic changes in policy. Scores on the ICRG index indicate the mean value of these three variables. Higher values indicate higher QoG (Svallfors 2013: 371).

in implementing authorities. This trust does not necessarily mean high QoG, since people can have trust in corrupt institutions as well, if they are the ones being favored by the system. Therefore, both the ICRG index and political trust are used when investigating interactions to see if it produces different results. The ideal measure would be to have individuals' own perceptions of QoG, but as has been shown by Svallfors (2013) these are strongly correlated with expert-based judgments and appear to be driven largely by the same factors. One drawback with the ICRG indicator is that it does not take into account varying levels of corruption or QoG within countries; it provides an average measure. It is, for example, possible that people who live in areas that are more affected by corruption are more negative towards green taxes than people in less corrupt areas.

Controls[30]

Individual-level controls

One individual characteristic that is included in the analysis is personal or household income. Income is an important variable since it has been found to affect public support for economic instruments in particular (Hammar & Jagers 2006; Harring & Jagers 2013; Harring 2014, 2015; Harring & Lapuente 2016). It is assumed that people at higher income levels can afford the extra costs, which makes them less averse towards taxes and other economic incentives. Another reason to include income is that environmental concern, which has been shown to be closely related to post-materialist attitudes, is related to income. People with high incomes have more post-materialist attitudes and are more concerned about the environment (Franzen & Meyer 2010). The possible influence on post-materialist values and the dependent variable are two reasons for including income as a control variable. Personal income was only available in the ISSP dataset, while from the WVS dataset household income is used instead. The former was log-transformed due to a positively skewed distribution.

Another control variable that has been used in previous studies is political party affiliation or ideology. People's attitudes towards government steering are typically affected by ideological positioning. Some studies have found that both people to the left and right are more positive towards economic instruments than those who lack a clear left or right position. It has been suggested that people who consider themselves more to the left on the political scale are more positive towards taxation in general, whereas people to the right (if right means more market-oriented) are more positive towards the

[30] For the exact coding of control variables see Appendix A.

market-based mechanisms underlying such economic tools (Harring 2016). Other studies have found that environmental protection is a political ideology issue in some countries, while in many countries it is not. Many studies have shown that support for environmental protection is stronger in countries where people are more to the left, but recent studies have shown that it is rather the opposite if anything (Fairbrother 2016). Whether support for higher taxes to protect the environment depends on a person being left or right thus appears inconclusive based on findings in previous research.

Provided that individuals' perceptions of environmental conditions and whether they consider themselves and people close to them to be affected by environmental problems are argued to matter for their attitudes towards imposing policies to decrease pollution, controls for this are included. Country-level variables measuring the current state of the environment (e.g. GHG emissions per capita or the Environmental Performance Index), would not provide an accurate picture of people's perceptions of and whether they are affected by environmental problems. Pollution might be more concentrated to certain areas within a country, making some people more supportive of measures to decrease pollution than others. Thus, individual-level controls are included. From the WVS dataset an index combining three survey questions was created. The respondents were asked to rate the severity of different environmental problems in one's community, including poor air quality, poor water quality, and poor sewage and sanitation (Cronbach's alpha: 0.899). These particular issues were selected because they are more easily perceived and can pose direct health effects compared to, for example, loss of biodiversity or pollution of the world's great oceans, lakes and rivers, which most people perceive as less of a threat. From the ISSP data, a survey question asking respondents if environmental problems have a direct effect on their everyday life is used. As has been theorized and found in previous research, those who are most affected by pollution are more likely to be supportive of policies aimed at decreasing pollution (Schade & Schlag 2003; Cherry et al. 2012; Hammar & Jagers 2006; Kallbekken & Sælen 2011).

Demographic variables including education, age and gender are also included in the analysis. Previous research has shown that more highly educated people (e.g. those holding a university degree or at least have studied at universities/colleges) are likely to be more positive towards green taxes than less educated people (Hammar & Jagers 2006). Age and gender have been argued to matter for people's attitudes toward the environment and policies for environmental protection. Young people and women are assumed to be more positive towards environmental protection in general (Hornback 1974; Van Liere and Dunlap 1980, in Harring 2016). Age has been found to affect attitudes towards higher taxes for environmental protection, showing that people older than 30 are more negative than

people at lower ages and that younger people are more likely to be supportive. Gender has been found to have no considerable effect or no effect at all on support for (increased) taxes to protect the environment (see Hammar & Jagers 2006; Harring 2016). In many studies this variable has not been included at all. Given that a different dataset is used in this analysis (the WVS dataset), gender is included as a control.

Employment status was also included due to its potential effect on both the dependent and one of the independent variables (environmental values). Inglehart's 4-item post-materialist scale has been criticized to be affected by more temporary things like unemployment and inflation (Hansen & Tol 2003). It is possible that, for example, a person who recently lost one's job expresses more materialist values than he or she would if they had stayed employed (as they have been perhaps for many years prior). Employment status, which is related to a person's income[31], could also affect attitudes towards higher taxes for environmental protection held by respondents at the time of the survey. A person who states that one is currently employed is expected to be more positive towards green taxes, since he or she can afford the extra costs. For these reasons, employment status is an important control to include.

Country-level controls

Two variables are included as controls on the country level: real GDP per capita and current tax-level. Current tax-level is included as a control due to the phrasing of the survey questions used to measure the dependent variable; referring to an increase in taxes from the current tax-levels. Moreover, it is possible that people who live in countries where overall tax-levels are high; already having enough extra costs, are more averse towards tax-increases. To capture current tax-levels the best available proxy is used, measuring tax-revenues as the percentage share of GDP. This measure does not only include environmental taxes, which is good since it is the overall tax-level of a country that matters and not just environmental taxes.

Real GDP per capita is used as a control in some of the models in this study, as a proxy for economic development.[32] It is not included in the models with interaction terms since it would be difficult to disentangle the effects of QoG and economic development. People living in countries with high levels of economic development could be expected to be more supportive of green taxes than people

[31] The correlation with household income is weak (.205) and the correlation with personal income is moderate (.456).

[32] The advantage of real GDP per capita over normal GDP per capita is that it takes into account inflation.

in low income countries, due to more green values as a result of post-materialism (Inglehart 1995). Moreover, green taxes are expected to imply higher costs (i.e. some will not be able to afford them), but they might also be perceived as something that could impede economic growth. In countries where a certain level of economic development has not yet been reached, individuals might thus be more averse towards green taxes (Harring 2016).

Economic development could also have a negative effect on support for green taxes[33], since high-cost behaviors are more likely to be targeted in developed countries where most people can afford to own a car or engage in other polluting activities. Research shows that people who are affected by a policy (in terms of inflicting costs and requiring behavioral changes) are more averse towards imposed measures (Jakobsson et al. 2000; de Groot & Schuitema 2012; Hammar & Jagers 2006; Kallbekken & Aasen 2010). For these reasons real GDP per capita is an important control. It is problematic to exclude economic development from any analysis dealing with support for the environment, provided the effects that economic development has on people's values and the ability to pay higher taxes for environmental protection. However, it is necessary in this case to avoid blurring the picture showing the results of the interactions. Real GDP per capita was log-transformed.

Limitations and scope conditions

This study only looks at support for environmental taxes in general as policy instruments for protecting the environment, not choices between different instruments[34] (see Harring 2014a) that could provide for deeper understandings on people's underlying motivations. Contrasting support for taxes against support for regulations would be interesting. Furthermore, this study does not distinguish between what kinds of behaviors that are targeted by the environmental taxes. Following from this, different levels of coerciveness and perceived individual costs are not taken into account – two factors with influence on support for various policy instruments. With better data, and separation of targeted high- and low-cost behaviors, perceived individual costs could be included in the analysis. Other explanatory factors of public support that are not included in the analysis of this paper are the perceived fairness and effectiveness of taxes. The main focus here is on trust, values and QoG, while other explanations such as these are left aside for other research. Institutional context, or the quality of government institutions, is chosen as the moderating factor of individual-level relationships since

[33] Gelissen (2007), for example, applying a multilevel analysis on 50 countries using WVS data found that people in wealthier countries are less willing to pay for environmental protection.

[34] This would, however, significantly complicate the interpretation of the interaction terms used in this study.

this is a factor that has been discussed extensively in the literature and has strong theoretical reasons to be included in an analysis of green taxes in particular. The problem of excluding economic development is something that should be kept in mind, however, and trying to disentangle the effects between QoG and economic development is beyond the scope of this paper.

While the results of the study could be generalizable to a larger population of individuals and countries, given that we find the same effects in both datasets, we still cannot make any causal inferences based on the performed analysis since this requires the use of time-series or panel data. This is one of the drawbacks with the method used[35] (see Feller & Gelman 2015; Hill 2013). One limitation that could potentially affect the results of the analyses is that we cannot take into account whether environmental taxes are understood differently in different country contexts. In corrupt contexts, the tax-system might not be understood in the same terms as in high QoG contexts where people cannot escape from paying the taxes, or people might not comply with the taxes even if they have stated that they are supportive of them.[36] The second-order free-riding problem is most likely larger in low QoG countries, as explained above. This might be a valid explanation for the case of Mali, an identified outlier[37], where corruption has been described as being widespread and systematic across all levels of society (Transparency International 2008), and still remains a big problem (Freedom House 2015). Other limitations, mainly related to the measures used in operationalizing the variables of interest are discussed above. With these limitations in mind, we now turn to the results of the analysis.

Results

The results of the multilevel analysis using WVS data are presented in table 1 below. This analysis includes political trust measured as trust in implementing institutions and uses QoG as part of the

[35] We can only talk about associations, even if modeling varying effects can help in making causal inferences.

[36] In several developing countries (e.g. Ethiopia, Ghana, Peru, Thailand, Mali and Burkina Faso) support for green taxes is relatively high compared to developed countries or emerging economies (see figure 3 and 4, Appendix D), despite high corruption levels. While people in these poor countries might be supportive of green taxes since they are highly affected by environmental degradation, they might not be willing to pay the taxes in the end. In African countries, most people see government tax-revenues as important national development resources, but distrust in tax-officials causes high non-compliance with tax obligations and makes tax-evasion more acceptable among citizens (Afrobarometer 2013). In Latin American countries, state legitimacy, including corruption, is an issue that affects people's view of tax-obligations; making tax-evasion highly justified in some country contexts (Latinobarometer 2010). In low QoG countries in European contexts similar issues might exist due to corruption, but people might not be as affected by environmental degradation and climate change (related to geographic location), resulting in higher tax-aversion instead (e.g. Hungary, Romania and Ukraine).

[37] Mali scores high on the dependent variable compared to all other countries in the sample, despite having the lowest score on ICRG's indicator of QoG.

interaction terms. Results with the alternative operationalization of political trust are presented in table 1 and interactions with political trust are presented in tables 2 and 3 in Appendix B.

The first model includes fixed effects of trust and values without individual- and country-level controls; these are added in the second model. The third model includes a random effect of social trust and an interaction term without controls; the fourth model adds controls. The fifth model includes a random effect of post-materialist values and an interaction term without controls; the sixth model adds controls. Models 2, 4 and 6 include individual-level controls (household income, ideology/left-right political affiliation, affected by environmental degradation, education, age, gender and employment status). All six models include random intercepts.

The estimates of the fixed effects are interpreted as the average effect of each predictor across all countries in the sample, while the estimates of the random effects are interpreted as the variance from these average effects. Since some of the variables have been centered (see Appendix A), the intercept (constant) is interpreted as the mean of the dependent variable at the value that the predictor was centered on, which in this case is the country mean. The random intercept is in turn the variance from this intercept.

TABLE 1. MULTILEVEL ANALYSIS USING WVS DATA.

DV: Public support for green taxes	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Fixed effects						
Level 1						
Political trust *(index1)*	.08*** (.01)	.08*** (.01)	.08*** (.01)	.08*** (.01)	.08*** (.01)	.08*** (.01)
Social trust	.03*** (.01)	.02*** (.01)	-.01 (.03)	-.01 (.03)	.03*** (.01)	.02*** (.01)
Values						
Materialist[a]	-.06*** (.01)	-.04*** (.01)	-.06*** (.01)	-.05*** (.01)	-.06*** (.01)	-.05*** (.01)
Post-materialist[b]	.15*** (.02)	.12*** (.02)	.15*** (.02)	.12*** (.02)	-.10 (.07)	-.08 (.08)
Interaction effects						
Social trust*QoG			.06 (.05)	.05 (.05)		
Environmental values*QoG					.37* (.11)	.30* (.11)
Individual-level controls[c]	excluded	included	excluded	included	excluded	included

Level 2						
Current tax-level		-.004 (.007)		-.01 (.008)		-.01 (.008)
Real GDP per capita (log)		-.15** (.05)				
QoG		.44 (.29)	-.22 (.21)	-.20 (.20)	-.27 (.21)	-.24 (.21)
Constant	2.64*** (.04)	3.51*** (.34)	2.77*** (.13)	2.65*** (.18)	2.80*** (.13)	2.68*** (.18)
Random effects						
Constant (country intercepts)	.06*** (.01)	.04*** (.01)	.05*** (.01)	.05*** (.01)	.05*** (.01)	.05*** (.01)
Social trust			.002** (.001)	.002** (.001)		
Environmental values *(post-materialist)*					.01 (.004)	.01* (.004)
Log likelihood	-64022.84	-63632.37	-63979.34	-63599.04	-63986.10	-63608.80
AIC	64036.84	63680.37	64001.34	63651.04	64008.10	63660.80
N (Level 1)	26472	26472	26472	26472	26472	26472
N (Level 2)	32	32	32	32	32	32

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: World Values Survey – Fifth Wave (2005-2009) and QOG Basic Cross-Section Data 2015.*

We can see that social and political trust and people's values are highly significant predictors of support for environmental taxes. People with higher levels of social and political trust are more supportive of taxes. Political trust has a bigger effect size than social trust, and when using the traditional measure of political trust operationalized as trust in government, political parties and parliament the effect size is only slightly bigger (see table 1, Appendix B). The coefficients of social trust and political trust are interpreted as the effects of a one standard deviation difference on the mean of the dependent variable. The coefficients of values have the expected signs; individuals with post-materialist values are generally more supportive of higher taxes to protect the environment than people who prioritize materialist values. QoG is not statistically significant in any of the models.[38] The high correlation (.778) between real GDP per capita and QoG could cause multicollinearity in my models. Therefore, real GDP per capita is not included in the models with interaction terms. When running an analysis of model 2 without real GDP per capita QoG remained insignificant, and when excluding

[38] In models 3-6 this should not come as a surprise since QoG is part of the interaction term.

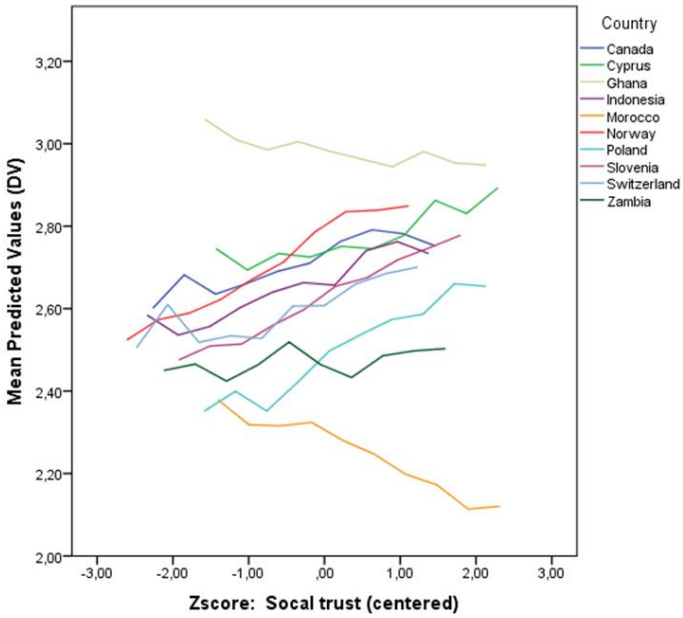
QoG the negative effect of real GDP per capita persisted. Nevertheless, the results of the second model that includes both QoG and real GDP per capita should be interpreted with caution. Following Svallfors (2013) argument not to include variables that are possibly endogenous to the variables of analytical interest[39], in this case QoG, a model was also run without political trust. This did not change the outcome results, therefore both variables are included.

As we can see in models 3 and 4, the random effect of social trust is significant, meaning that social trust has a varying effect across countries (see figure 3), but the interaction terms are not significant. When using political trust in the interaction instead, this term is significant however. From the results of model 4 in table 2 in Appendix B, we can derive that as political trust increases the positive effect of social trust on support for green taxes decreases.[40] This is also true for the alternative operationalization of political trust (see table 3, Appendix B). That is, social trust becomes less important at higher levels of political trust. The coefficient of social trust is now interpreted as the effect on public support when political trust is zero and, based on the results, social trust should thereby have a positive effect even at low levels of political trust. The varying effect of social trust across a sample of countries is illustrated in figure 3 (for graph including all 32 countries see figure 1, Appendix D).

[39] Including such variables in the model would, according to Svallfors, "completely blur the picture" (Svallfors 2013: 370).

[40] Adding the coefficients of the individual effect of social trust (.02) and the contingent effect (-.012), we can derive that the positive effect is decreasing.

FIGURE 3. THE RANDOM EFFECT OF SOCIAL TRUST ON SUPPORT FOR GREEN TAXES ACROSS 10 COUNTRIES.



Data: World Values Survey, Fifth Wave (2005-2009).

The graph shows the mean expected values on the dependent variable for each standardized score on the social trust scale for each country. From the graph, we can derive that people with similar scores on social trust in different countries have varying levels of support for green taxes. For example, individuals with a Z-score of 1 on the social trust scale in Indonesia are generally less supportive of (or more averse toward) green taxes than individuals with the same Z-score in Norway or Canada, but more supportive (or less averse) than individuals with the same Z-score in Slovenia or Poland.[41] We can also see that individuals with different levels of social trust *within* countries have different levels of support for green taxes, looking at the random slopes. A few of the countries in the total sample show downward slopes, as is illustrated by the cases of Ghana and Morocco.[42] In these countries, support for taxes is lower (or aversion is higher) at higher levels of social trust. Several countries in the sample show relatively plane, but crooked slopes with high and low peaks, as is illustrated by the case of Zambia. For cases like this, it is difficult to interpret whether support (or aversion) is

[41] Recalling that value 3 on the dependent variable (y-axis in the graph), indicates support for green taxes.

[42] Only Morocco was identified as a statistically significant outlier. Removing Morocco from the model did not make any changes to the final results – the decreasing positive effect of social trust at higher levels of political trust remains (see table 6, Appendix B).

higher or lower at higher levels of social trust in the country, unless one only looks at both ends of the slope. Most of the countries in the sample show upward slopes, as is illustrated by the cases of Canada, Cyprus, Indonesia, Norway, Poland, Slovenia, and Switzerland. In these countries, support for taxes is higher (or aversion is lower) at higher levels of social trust. Generally, the slopes do not appear to vary much across countries (see figure 1, Appendix D).

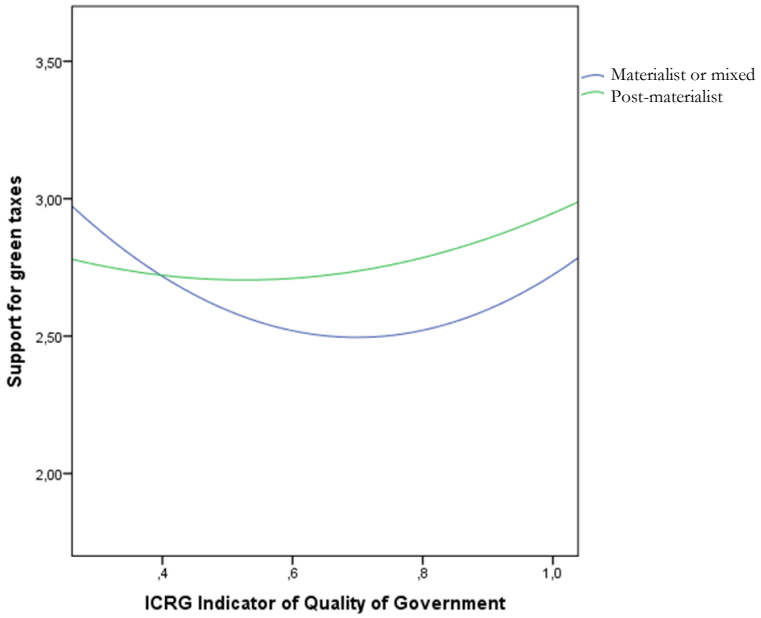
From models 5 and 6, we can see that the interaction terms of post-materialist values and QoG are significant.[43] This holds also when the alternative measure of political trust is used in the analysis (see table 1, Appendix B), and the interaction term is insignificant when any of the operationalizations of political trust are used as part of the interaction term instead of QoG (see model 6 in tables 2 and 3, Appendix B). Based on the results of model 6, we can see that post-materialist values have a negative effect on zero (low) levels of QoG. As QoG increases the negative effect decreases, and when higher levels of QoG are reached the effect becomes positive.[44] At higher levels of QoG, the positive effect of values on support for green taxes consequently gets stronger. The interaction effect between values and QoG is illustrated in figure 4 below. [45]

[43] Political trust can be considered an endogenous variable to QoG (Svallfors 2013), the same analysis was therefore performed without political trust included – the results remained the same however.

[44] The effect becomes positive when QoG is about 0.27; at this threshold the positive effect is weak (.001).

[45] Because of limitations in the software used, the marginal effect of values could not be displayed. Instead, the graph shows *trends*, that is, the general level of support for green taxes among individuals holding different values.

FIGURE 4. THE INTERACTION BETWEEN QOG, VALUES AND SUPPORT FOR GREEN TAXES.[46]



Data: World Values Survey, Fifth Wave (2005-2009), and QOG Basic Cross-Section Data (2015).

The green line (the upper line at score 1 on the x-axis) represents post-materialist values, and the blue line materialist or mixed values. While the negative effect of post-materialist values is not very clear from this graph, showing trends, we can see that people with post-materialist values in high QoG countries are generally more supportive of green taxes than people in low QoG countries. As countries reach score 1 on the ICRG indicator of QoG, the average effect of green values is positive.[47] Since the graph only shows trends and not the marginal effect of values on support, we cannot say that the effect gets any stronger; only that people holding similar (or different) values have varying levels of support for green taxes at different levels of QoG. From the graph, we can see that people with post-materialist values are generally *less* supportive of green taxes than people with materialist or mixed values at low levels of QoG (approximately below score 0.4 on the ICRG indicator). Past the intersection of the two lines, people with post-materialist values are generally more supportive of

[46] This graph was produced without Mali, which was found to be a statistically significant outlier. While removing Mali did not make any significant changes to the estimates of the analysis (see table 7, Appendix B), it did change the outlook of the graph. For the resulting graph with Mali included see figure 2, Appendix D.

[47] People with post-materialist values in high QoG countries are generally supportive of green taxes, but they *can* be supportive at lower levels of QoG as well.

(or less averse towards) environmental taxes than people holding materialist or mixed values. At higher levels of QoG, the difference in support for green taxes between the value types is larger.

In model 5, the random effect of post-materialist values is not significant. In another version of the fifth model, where only random slopes and no interaction was included, this random effect was significant however. Including the interaction term in the model made the variation in the effect of post-materialist values disappear (the random effect is no longer significant), which means that QoG successfully explains why the effect of values varies across countries.[48] In model 6, with controls, the random effect is still significant but the variance in the effect of values did decrease when the interaction term was added to the model.

The results of the multilevel analysis using ISSP data are presented in table 2 below. The six models follow the same structure as the above models with the WVS data. Models 2, 4 and 6 thus similarly include individual-level controls (personal income, ideology/left-right political affiliation, affected by environmental degradation, education, age, gender and employment status). Following the above analyses using WVS data, interactions using QoG are presented here. Results with alternative operationalizations of social and political trust and the models using political trust as part of the interaction terms can be found in table 4 in Appendix B. The alternative operationalization of social trust cannot be argued to be better, rather the two-item index should be able to capture social trust better than the one-item measure if anything. The political trust measure consisting of one item only could, on the other hand, be argued to be better than the two-item index, since it should exclude the risk of capturing trust in the current government. The results presented in table 2 below are from the analysis including both two-item indexes of trust.

[48] The high correlation with economic development should, however, be kept in mind.

Table 2. Multilevel analysis using ISSP data.

DV: Public support for green taxes	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Fixed effects						
Level 1						
Political trust *(index)*	.15*** (.01)	.15*** (.01)	.16*** (.01)	.16*** (.01)	.15*** (.01)	.15*** (.01)
Social trust *(index)*	.15*** (.01)	.13** (.01)	.15* (.07)	.16* (.07)	.15*** (.01)	.13*** (.01)
Values						
Materialist[a]	-.19*** (.02)	-.13*** (.02)	-.19*** (.02)	-.14*** (.02)	-.18*** (.02)	-.13*** (.02)
Post-materialist[b]	.32*** (.03)	.22*** (.03)	.31*** (.03)	.21*** (.03)	.42 (.22)	.39 (.23)
Interaction effects						
Social trust*QoG			-.01 (.01)	-.05 (.09)		
Environmental values*QoG					-.12 (.27)	-.20 (.28)
Individual-level controls[c]	excluded	included	excluded	included	excluded	included
Level 2						
Current tax-level		-.002 (.01)		-.002 (.01)		.003 (.01)
Real GDP per capita (log)		.005 (.14)				
QoG		.65 (.49)	.57* (.27)	.67* (.30)	.58* (.28)	.61 (.31)
Constant	2.53*** (.05)	1.57 (1.21)	2.11*** (.21)	1.61*** (.24)	2.10*** (.21)	1.56*** (.24)
Random effects						
Constant (country intercepts)	.07** (.02)	.06** (.02)	.06** (.02)	.07** (.02)	.06** (.02)	.07** (.02)
Social trust			.005* (.002)	.005* (.002)		
Environmental values *(post-materialist)*					.03 (.02)	.03* (.02)
Log likelihood	-44756.50	-43998.48	-44709.84	-43949.78	-44738.53	-43976.99
AIC	44770.50	44052.48	44731.84	44007.78	44760.53	44034.99
N (Level 1)	14479	14479	14479	14479	14479	14479
N (Level 2)	26	26	26	26	26	26

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b:*

reference category – materialist or mixed; c: see main text. Source: International Social Survey Programme – Environment III 2010 and QOG Basic Cross-Section Data 2015.

Similar to the WVS data, social trust and political trust are shown to be significant predictors of public support for environmental taxes. As political and social trust increases, support for green taxes increases. Both variables of trust are standardized, and coefficients are interpreted in the same way as with the WVS data. The effect size of political trust is bigger than the effect size of social trust in model 2 without interactions. With the alternative operationalization of political trust, it is the opposite; the effect size of social trust is bigger than the effect size of political trust (see models in table 4, Appendix B). Values also come out significant with the expected signs; post-materialism has a positive effect and materialism has a negative effect on public support for environmental taxes. As was the case with the WVS data, model 2 should be interpreted with caution, due to potential multicollinearity. When running an analysis on model 2 without real GDP per capita, QoG turns out significant. Running the analysis without QoG, on the other hand, real GDP per capita remains insignificant (see table 5, Appendix B).[49] As we can see in models 3, 4 and 5 the coefficient of QoG is positive and significant; as the level of QoG increases people become more supportive of green taxes.[50]

The interesting results are those in models 3-6 including the random effects and interactions. The random effect of social trust is significant in model 3 and 4, but the interaction term is not significant. When political trust is used in the interaction instead of QoG, the interaction term turns out significant however (see table 4, Appendix B). The effect is contrary to the results of the analysis using the WVS data. Calculating the total effect of social trust by adding the coefficients of social trust and the interaction term, the interpretation is that as political trust increases the positive effect of social trust increases (not decreases). The coefficient of social trust is positive and significant at zero levels of political trust, meaning that social trust has a positive effect even at low levels of political trust. The random effect of social trust is still significant when the interaction term is included, but the variance in the effect of social trust decreases by adding the interaction term to a random slopes model.[51] Contrary to the findings in the analysis with the WVS data, no significant interaction effect between values and QoG (or political trust) is found in models 5 and 6.

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[49] This holds when removing personal income, which has a strong correlation (.621) with real GDP per capita.

[50] The insignificant coefficient in model 6 could be explained by the strong correlation (.654) with personal income (when personal income is removed, QoG is significant), and/or the inclusion of the interaction term.

[51] Random slopes models are not presented due to the small margins (number of decimals); they would not show any difference in variances after rounding off the estimates.

There are no big differences between the models with or without controls in both datasets as regards the coefficients of the main explanatory variables, as well as the interaction terms and random effects. Results should, however, be interpreted looking at the full models. We can see that the model fit improves by looking at the AIC values. The AIC is corrected for model complexity, which means that it takes into account the number of parameters that have been estimated. Smaller values mean better model fit. Log-likelihood, also a measure of model fit, can only be compared if the new model contains all of the effects or *predictors* of the former model. Consequently, we cannot compare models without controls with models with controls. Comparing the log-likelihood of model 2 with the log-likelihoods of models 4 and 6, we can see that the model fit has significantly improved by modeling the variability in slopes.

Analysis

From the results of the analyses, we can conclude that the effects of political and social trust are pretty constant across country contexts and different datasets. People with higher social and political trust are generally more supportive of higher taxes to protect the environment. This provides support to the first hypothesis (H_{1A} and H_{1B}), and we can say that trust holds as an explanation for public support for green taxes internationally. Generally, the effect size of political trust is larger than the effect size of social trust, even if there is some indication of the opposite with an alternative operationalization. This was the case when using a measure combining political trust measured as trust in politicians and social trust measured by the commonly used trust question.[52] Since the WVS data offers a better measure of political trust measured as trust in implementing institutions, one could argue that the results of the analysis using WVS data provides a more accurate picture. As has been shown in recent research, the effect of political trust on support for environmental protection[53] is much larger than the effect of social trust (Fairbrother 2016). The majority of the operationalizations used in the analyses in this study support this finding. In this paper, the effect of social trust was found to vary cross-nationally, which can be explained by levels of political trust. This partly adds to the superiority of political trust over social trust in explaining public support for environmental taxes. The interaction between social and political trust is discussed further below.

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[52] "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"

[53] Using willingness to pay higher taxes/prices or to make economic sacrifices for environmental protection as dependent variable, which is similar to the operationalization of the dependent variable in this study.

With regard to the individual effect of the quality of government institutions, the results were rather mixed across the two datasets. In the ISSP dataset, the problem of including real GDP per capita and QoG in the same model was illustrated. Excluding real GDP per capita, made QoG significant across most of the models, showing that people living in high QoG countries are more supportive of environmental taxes. In the analysis using the WVS data, QoG did not turn out significant despite excluding real GDP per capita and possible endogenous variables. So, while the second hypothesis (H_2) is supported by the ISSP data, it is not supported by the WVS data. We can only speculate about why this is the case, keeping in mind that the two datasets include different countries. While the ISSP sample mainly consists of European or Western countries, the WVS sample is much more balanced and international in scope.

Since the WVS data contains a broader range of countries, we could also expect the variation in QoG to be larger. One plausible argument for why we still do not find a significant effect, is that people have different understandings of corruption; something that is considered a gift in some cultures is considered a bribe in other cultures where corruption is not as widespread (Bardhan 1997; de Sardan 1999; Hasty 2005, in Persson et al. 2013). This causes substantial variation in public acceptance of corruption across countries and could be one reason why QoG does not appear to matter in this dataset. Furthermore, the measure of QoG included in the analyses does not take into account variations in QoG within countries. It is possible that people living in areas where corruption is widely spread are more negative towards taxes than people who live in areas with less corruption. Taking into account this variation might change the outcome. From these results, QoG does not appear to have a constant effect internationally and across datasets. In some cases, it appears like political trust is what matters for support for green taxes rather than the quality of government institutions when looking at the interactions.

An interesting side note is that real GDP per capita was found to have a negative effect in the WVS dataset, that is, people living in wealthier countries are negative towards an increase in taxes for environmental protection. Theoretically, we would expect people in these countries to be more supportive of green taxes, given the effect of economic development on values and the affordability of paying higher taxes. As has been found in previous research, economic development can have a negative effect on public support for taxes. The explanation provided here is that people engaging in polluting activities are more likely to be targeted by policies such as taxes in developed countries, making them more averse. People in less developed countries, on the other hand, who usually are

most affected by environmental pollution, are likely to be more supportive of taxes for environmental protection. The results of the analysis using WVS data support these arguments.

Concerning the random effects and interactions, which are the main contribution of this study, some interesting results were found. There is a significant random effect of social trust, even if the varying effect across countries is not that large. In both the WVS and ISSP datasets no interaction was found between social trust, QoG and public support for green taxes. This does not provide support to the third hypothesis (H_3) that the effect of social trust is contingent on QoG. However, the effect of social trust was found to be contingent on political trust instead. The results from the analyses using WVS data and ISSP data are conflicting. While the WVS data shows that the positive effect of social trust decreases when political trust increases, the ISSP data shows that this effect increases. The former is counterintuitive since theory predicts that political trust increases social trust: when people perceive implementing institutions as more trustworthy, trust in others to comply with imposed policies should also increase.

One reason why the effect of social trust would decrease could be a belief that the tax-system will be credibly enforced and potential free-riders punished, when political trust is high. In a sense, social trust becomes subordinate to political trust. The findings within the ISSP dataset fits the theoretical reasoning made in this paper, that social trust should not even matter at low levels of QoG, better. At higher levels of QoG, along with higher political trust, social trust should have a stronger positive effect. The interaction taking place between political trust and social trust needs to be further explored, since it appears to vary across countries and datasets. The results of this study show that it is political trust that matters for the effect of social trust on support for green taxes, and not the quality of government institutions, which suggests that they (to some extent) are measuring different things. The weak correlation between political trust and ICRG's indicator of QoG (see figure 5, Appendix D) supports this interpretation.

The fourth hypothesis (H_4) on the interaction between environmental values, QoG and support for environmental taxes is supported by the WVS data. Based on the results of the analysis post-materialist values have a negative effect at zero levels of QoG, and as QoG increases this effect becomes positive and stronger at higher levels of QoG. From the graph illustrating the interaction between green values and QoG (figure 4), we cannot really see that the effect of values is negative at low levels of QoG, but we can see that the average effect of post-materialist values is positive at high levels of QoG (as countries pass the score 0.8 on the ICRG indicator). With a margins plot we could see if

the effect of green values gets stronger visually, and if the effect is negative at low levels of QoG. From the interpretation of model estimates, the results are similar to the findings of Svallfors (2013) on the effect of egalitarian values on support for higher taxes and spending, showing that a similar theoretical reasoning can be applied in the environmental domain. People with egalitarian values, or as in this case green values, living in low QoG societies are generally not willing to support higher taxes for environmental protection. The same interaction was not found when using political trust as part of the interaction term, which indicates that perceived government quality is what matters here and not political trust.

In the discussion on the operationalization of QoG, it was suggested that perceived QoG, that is, individuals' perceptions of QoG, could be captured using political trust measured on the individual level or ICRG's indicator of QoG on the country level. From the results of this study, looking at the interaction effects, political trust does not seem to capture people's perceptions of government quality. When exploring the contingent effect of values, only the interaction term including QoG was statistically significant. Exploring the contingent effect of social trust, only the interaction term including political trust was statistically significant. Political trust appears to capture trust in implementing institutions, which does not necessarily translate into trust in their fair, efficient and impartial performance. As has been suggested, people can have trust in corrupt institutions as well. There is also a possibility that there is less statistical power in ICRG's indicator of QoG than in political trust, due to fewer units – all individuals within one country are assigned the same country mean, resulting in less variation. This could explain the significant interaction effect between political trust and social trust, but it does not explain the significant interaction effect between QoG and values. In the latter case, the strong correlation between QoG and economic development could be an underlying factor behind the significant interaction. Therefore, both interactions should be interpreted with caution.

A significant interaction between values and QoG was not found in the ISSP dataset, however. This is also something that we can only speculate about. One reason could be the relatively bigger dataset from the WVS. Sometimes it is possible that we find a significant effect simply because we have a large enough dataset. The ISSP dataset is smaller, containing fewer groups on the country level and fewer individuals, and consequently has less variation. Investigating the interaction effect between values and QoG in other datasets, could confirm whether there in fact is a significant interaction effect. From the results of this study, there appears to be an interaction between people's post-materialist values and the quality of government institutions. Given the results of the WVS data, QoG is what converts values into support for green taxes – at low levels of QoG post-materialist values have

a negative effect. This can be explained as people with green values, who are more concerned with environmental problems, not wanting to provide corrupt and inefficient public institutions with additional resources that could end up being used on polluting activities instead of environmental protection.

Conclusion

The aim of this paper was to investigate potential interaction effects between individual- and country-level variables to explain public support for environmental taxes internationally. The research question asked was: Do the effects of values and social trust on public support for environmental taxes vary depending on country context? Specifically, the aim was to explore the interactions between perceived QoG and social trust and environmental values respectively and, additionally, to see whether different operationalizations of the main variables of interest will affect the results.

From the analyses, we can conclude that there are no major differences in results when using alternative operationalizations. The effects of political and social trust are rather constant both across countries and datasets, and political trust is a relatively stronger predictor of public support for green taxes. The random effects of both social trust and values are not as large as we would have expected, given the varying levels of QoG across countries and the assumed interaction effects. QoG was found to be a statistically significant moderator of the relationship between values and public support for green taxes in the WVS dataset. As was theorized, green values have a stronger effect at high levels of QoG. On the other hand, QoG was not found to moderate the relationship between social trust and public support for green taxes. Here, the level of political trust acts as a moderator instead. Thus, the results of the study provide some support for that the effect of values depends on country context, whereas the effect of social trust appears to depend on political trust on the individual level instead.

The results from the analyses of the ISSP and WVS data were, however, conflicting. While a positive relationship between the effects of political and social trust on the dependent variable was found with the ISSP data, a negative relationship was found with the WVS data. Since a significant relationship between values and QoG was not found in the ISSP data, both these relationships need to be further investigated in future research. Using better measures of the main variables, including the dependent variable, trust and values, and testing the interactions that were found in this paper on other datasets could confirm or disentangle the true effects. Given the results of this study, the direct effects of QoG and economic development on public support for green taxes also need further investigation.

QoG was not found to be a statistically significant predictor on its own using WVS data, which was unexpected provided that theory predicts that QoG produces higher political and social trust. Real GDP per capita was found to have a negative effect in the WVS data, but no significant effect was found in the ISSP data. A future task, that would require high methodological skills and innovative techniques, is to try to disentangle the effects of QoG and economic development on environmental tax support.

From a theoretical and empirical point of view, further research on interactions between both individual- and country-level variables needs to be conducted to bring a clearer view of what the exact interactions look like. In this paper, the interaction between social and political trust and the interaction between QoG and values seem to differ depending on the country sample – because of its size or the countries included. It is also possible that interactions between other variables on the individual and country level exist, and these are encouraged to be explored. This study has only provided the first contribution, which will hopefully also trigger more in-depth studies of interactions in this area, using other methodological approaches. Looking at other environmental policy tools, in a similar way that support for green taxes was explored in this paper, can bring more insights into public support for climate policies in general.

In order for implementation of environmental taxes to be successful, public support is needed. From the results of this study, a few indications are provided that could potentially provide for future policy recommendations on how to increase public support if future research is able to support some of the findings here. In order for green values to have a positive effect, there appears to be a need for high QoG, since such values might even have a negative effect at low levels of QoG. Hence, as people in developing countries acquire more post-materialist values with increased economic development (following Inglehart's theory) there will be a need for high levels of QoG as well. Regarding social trust, the results of this study show that in most countries public support increases as social trust increases, but in a few cases the trend is the opposite; public support is lower at higher levels of social trust. This was true for two non-Western contexts in the WVS dataset and provides an indication of that social trust might not have the expected effect in all countries. Exploring why this is the case is of great importance since such countries differ significantly from other countries and might not fit into established models. If the positive relationship between social trust and political trust can be supported, the recommendation would be to build political trust in order to increase the positive effect of social trust. There is, however, no one recipe for increasing public support for environmental taxes across all country contexts since individual-level relationships vary within countries.

Future research should explore the effect of values on public support for green taxes further, since the results of this study show that people with *grey* values can also be supportive of such instruments even if they lack pro-environmental values. Why this is the case and at low levels of QoG where public institutions are perceived as corrupt and inefficient is an interesting puzzle. Further exploration of the relationships found here should be done cross-nationally to confirm large trends. Providing recommendations to specific countries on how to successfully implement environmental taxes will, nevertheless, require exploration of unique conditions in each country. Generally, we can conclude that in countries where social and political trust is high, people are more likely to support green taxes. Furthermore, people holding pure post-materialist values (strong green values) are likely to be supportive only at high levels of QoG.

To make environmental taxes a suitable solution across diverse country contexts, particularly in developing countries where tax-evasion is likely and often acceptable among the public, there is a need to build high QoG, state legitimacy and trust in tax-officials. While green taxes may be relatively highly supported in developing countries for various reasons, effective implementation is likely to be obstructed due to non-compliance. As such, taxes are perhaps not the best solution to solve first-order collective action problems in all contexts. Until people are actually willing to accept and *pay* higher taxes for environmental protection (i.e. to comply with imposed taxes), and public aversion is much lower than public support[54], other environmental policy tools might be more attractive and effective in changing people's non-environmental friendly behavior.

[54] Internationally, aversion towards green taxes is still relatively large compared to public support (see figure 3 and 4, Appendix D). Only in a handful of countries, public support is much larger than public aversion, but as was suggested low QoG in some of these countries might cause low compliance in practice.

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ISSP Environment III (2010): ZA5500_v2-0-0.sav retrieved from: https://dbk.gesis.org/dbksearch/sdesc2.asp?no=5500

The QOG Basic Cross-section data (2015) retrieved from: http://qog.pol.gu.se/data/datadownloads/qogbasicdata

APPENDIX

Appendix A: Descriptive statistics

TABLE 1. DESCRIPTIVE STATISTICS (WVS DATA)

Variable	Construct	Mean	Min	Max	Standard deviation	Source
Support for higher taxes to protect the environment *(V106)*	"I would agree to an increase in taxes if the extra money were used to prevent environmental pollution" "Strongly disagree", "Disagree", "Agree", "Strongly agree" *(reversed scale)*	2.64	1	4	0.85	World Values Survey (WVS)
Political trust *(V136+V137+V141)* mean-based centered standardized	3-item (α = 0.773) index 1: "Confidence in the police", "Confidence in the justice system", "Confidence in the civil services" "None at all", "Not very much", "Quite a lot", "A great deal" *(reversed scales)*	2.53	1	4	0.71	World Values Survey (WVS)
Political trust *(V138+V139+V140)* mean-based centered standardized	3-item (α = 0.843) index 2: "Confidence in the government", "Confidence in the political parties", "Confidence in parliament". "None at all", "Not very much", "Quite a lot", "A great deal" *(reversed scales)*	2.25	1	4	0.72	World Values Survey (WVS)
Social trust *(V47)* centered standardized	"Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?" "Would take advantage", "Try to be fair"	5.76	1	10	2.55	World Values Survey (WVS)
Values *(Y002)*	"If you had to choose, which one of the things on this card would you say is most important?" "And which would be the next most important?" "Maintaining order in the nation", "Giving people more say in important government decisions", "Fighting rising prices", "Protecting freedom of speech" "Materialist", "Mixed", "Post-materialist" *(recoded)*		0	2		World Values Survey (WVS)
Household income *(V253)*	Income deciles	4.98	1	10	2.31	World Values Survey (WVS)

Ideology/Party affiliation *(V114)*	"Far left", "Center left", "Center Liberal", "Conservative right", "Far right" *(transformed)*		1	5		World Values Survey (WVS)
Affected by environmental degradation *(V108+V109+V110)*	3-item (α = 0.899) index: "Poor air quality", "Poor water quality", "Poor sewage and sanitation" "Not serious at all", "Not very serious", "Somewhat serious", "Very serious" *(reversed scales)*	2.85	1	4	1.05	World Values Survey (WVS)
Education *(V238)*	"Incomplete/complete primary school", "Incomplete secondary school", "Complete secondary school", "University-level education with/without degree", "No formal education" *(transformed)*		1	5		World Values Survey (WVS)
Gender *(V235)*	"Male", "Female"		0	1		World Values Survey (WVS)
Age *(V237)*	"18-29", "30-45", "46+"		1	3		World Values Survey (WVS)
Employment status *(V241)*	"Unemployed", "Employed" *(transformed)*		0	1		World Values Survey (WVS)
Current tax-level (wdi_taxrev)	Tax revenues of GDP (%)	17.43	8	28	5.54	Quality of Government Institute (QoG)
Economic development (gle_rgdpc)	Real GDP per capita (2005) *(log transformed)*	17782.88	781	55691	14711.21	Quality of Government Institute (QoG)
Quality of government (icrg_qog)	International Country Risk Guide (ICRG) Index	0.62	0	1	0.20	Quality of Government Institute (QoG)

Note: Political trust and social trust are presented in uncentered and unstandardized form. Real GDP per capita is presented in normal form.

TABLE 2. DESCRIPTIVE STATISTICS (ISSP DATA)

Variable	***Construct***	***Mean***	***Min***	***Max***	***Standard deviation***	***Source***
Support for higher taxes to protect the environment *(V30)*	*"How willing would you be to pay much higher taxes to protect the environment?"*	*2.54*	*1*	*5*	*1.2*	*International Social Survey Programme (ISSP)*

	"Very unwilling", "Fairly unwilling", "Neither willing nor unwilling", "Fairly willing", "Very willing" (reversed scale)					
Political trust (V14) *centered* *standardized*	*"Most politicians are in politics only for what they can get out of it personally"* *"Agree strongly", "Agree", "Neither agree nor disagree", "Disagree", "Disagree strongly"*	*2.46*	*1*	*5*	*1.13*	*International Social Survey Programme (ISSP)*
Political trust (V14+V13) *mean-based* *centered* *standardized*	*2-item (α = 0.497) index: "Most politicians are in politics only for what they can get out of it personally"* *"Agree strongly", "Agree", "Neither agree nor disagree", "Disagree", "Disagree strongly"* *"Most of the time we can trust in people in government to do what is right"* *"Disagree strongly", "Disagree", "Neither agree nor disagree", "Agree", "Agree strongly" (reversed scale)*	*2.66*	*1*	*5*	*0.91*	*International Social Survey Programme (ISSP)*
Social trust (V11) *Centered* *Standardized*	*"Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"* *"You can't be too careful", "Most people can't be trusted"*	*2.88*	*1*	*5*	*1.30*	*International Social Survey Programme (ISSP)*
Social trust (V11+V12) *mean-based* *centered* *standardized*	*2-item (α = 0.703) index:* *"Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"* *"You can't be too careful", "Most people can't be trusted".* *"Generally speaking, do you think most people would take advantage of you if they got a*	*3.02*	*1*	*5*	*1.12*	*International Social Survey Programme (ISSP)*

	chance, or would they try to be fair?" *"Most people would try to take advantage", "Most people would try to be fair"*					
Values (V9+V10)	*"Looking at the list below, please tick a box next to the one thing you think should be [COUNTRY'S] highest priority, the most important thing it should do"* *"And which one do you think should be COUNTRY'S] next highest priority, the second most important thing it should do"* *"Maintain order in the nation", "Give people more say in government decisions", "Fight rising prices", "Protect freedom of speech"* *"Materialist", "Mixed", "Post-materialist"* *(transformed into one variable)*		*0*	*2*		*International Social Survey Programme (ISSP)*
Personal income (Ctry specific: rinc)	*Income in US dollars* *(log transformed)*	*2167.13*	*0*	*546830*	*8574.41*	*International Social Survey Programme (ISSP)*
Ideology/Political affiliation (PARTY_LR)	*"Far left", "Center left", "Center Liberal", "Conservative right", "Far right"*		*1*	*5*		*International Social Survey Programme (ISSP)*
Affected by environmental degradation (V38)	*"Environmental problems have a direct effect on my everyday life"* *"Disagree strongly", "Disagree", "Agree", "Agree strongly", "Neither agree nor disagree" (reversed scale)*	*3.15*	*1*	*5*	*1.08*	*International Social Survey Programme (ISSP)*
Education (DEGREE)	*"Lowest formal qualification (primary)", "Intermediate secondary completed", "Higher secondary completed", "University degree incomplete/completed", "No formal qualification"*		*1*	*5*		*International Social Survey Programme (ISSP)*
Age (AGE)	*"15-29", "30-45", "46+"*		*1*	*3*		*International Social Survey Programme (ISSP)*

Gender (SEX)	*"Male", "Female"*		*0*	*1*		*International Social Survey Programme (ISSP)*
Employment status (WORK)	*"Unemployed", "Employed" (transformed)*		*0*	*1*		*International Social Survey Programme (ISSP)*
Current tax-level (wdi_taxrev)	*Tax revenues of GDP (%)*	*19.82*	*9*	*34*	*6.71*	*Quality of Government Institute (QoG)*
Economic development (gle_rgdpc)	*Real GDP per capita (2005) (log-transformed)*	*26792.56*	*3360*	*55691*	*12495.47*	*Quality of Government Institute (QoG)*
Quality of government (icrg_qog)	*International Country Risk Guide (ICRG) Index*	*0.75*	*0*	*1*	*0.19*	*Quality of Government Institute (QoG)*

Note: Political trust and social trust are presented in uncentered and unstandardized form. Real GDP per capita and personal income are presented in normal form.

Appendix B. Results using alternative operationalizations and models

TABLE 1. ALTERNATIVE MODELS USING POLITICAL TRUST INDEX 2 (WVS DATA)

DV: Public support for green taxes	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Fixed effects						
Level 1						
Political trust *(index2)*	.09***	.09***	.09***	.09***	.09***	.09***
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Social trust *(V47)*	.03***	.02***	-.01	-.01	.03***	.02***
	(.01)	(.01)	(.03)	(.03)	(.01)	(.01)
Values						
Materialist[a]	-.06***	-.05***	-.06***	-.05***	-.06***	-.05***
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Post-materialist[b]	.15***	.12***	.15***	.12***	-.11	-.09
	(.02)	(.02)	(.02)	(.02)	(.08)	(.08)
Interaction effects						
Social trust*QoG			.06	.05		
			(.05)	(.05)		
Environmental values *QoG					.39**	.32*
					(.11)	(.11)
Individual-level controls[c]	included	excluded	included	excluded	included	excluded
Level 2						
Current tax-level		-.004		-.01		-.01
		(.01)		(.01)		(.01)
Real GDP per capita (log)		-.15**				
		(.05)				
QoG		.44	-.22	-.20	-.27	-.24
		(.29)	(.21)	(.20)	(.21)	(.21)
Constant	2.64***	3.50***	2.77***	2.65***	2.81***	2.68***
	(.04)	(.34)	(.13)	(.18)	(.13)	(.18)
Random effects						
Constant (country intercepts)	.06***	.04***	.05***	.05***	.05***	.05***

	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Social trust			.002**	.002**		
			(.001)	(.001)		
Environmental values *(post-materialist)*					.01	.01*
					(.004)	(.004)
Log likelihood	-63967.52	-63583.94	-63924.56	-63550.62	-63924.73	-62867.74
AIC	63981.52	63631.94	63946.56	63602.62	63946.73	62923.74
N (Level 1)	26472	26472	26472	26472	26472	26472
N (Level 2)	32	32	32	32	32	32

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: World Values Survey – Fifth Wave (2005-2009) and QOG Basic Cross-Section Data 2015.*

TABLE 2. ALTERNATIVE MODELS 4 AND 6 USING POLITICAL TRUST INDEX 1 (WVS DATA)

DV: Public support for green taxes	**Model 4**	**Model 6**
Fixed effects		
Level 1		
Political trust *(index1)*	.08***	.08***
	(.01)	(.01)
Social trust *(V47)*	.02*	.02***
	(.01)	(.01)
Values		
Materialist[a]	-.05***	-.04***
	(.01)	(.01)
Post-materialist[b]	.12***	.12***
	(.02)	(.03)
Interaction effects		
Social trust*Political trust	-.012*	
	(.005)	
Environmental values*Political trust		.01
		(.02)
Individual-level controls[c]	included	included
Level 2		
Current tax-level	-.01	-.01
	(.01)	(.01)
QoG	-.18	-.14
	(.20)	(.20)

Constant	2.65***	2.61***
	(.18)	(.18)
Random effects		
Constant (country intercepts)	.05***	.05***
	(.01)	(.01)
Social trust	.002**	
	(.001)	
Environmental values		.01*
(post-materialist)		(.005)
Log likelihood	-63593.86	-63614.81
AIC	63645.86	63666.81
N (Level 1)	26472	26472
N (Level 2)	32	32

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: World Values Survey – Fifth Wave (2005-2009) and QOG Basic Cross-Section Data 2015.*

TABLE 3. ALTERNATIVE MODELS 4 AND 6 USING POLITICAL TRUST INDEX 2 (WVS DATA)

DV: Public support for green taxes	**Model 4**	**Model 6**
Fixed effects		
Level 1		
Political trust *(index2)*	.09***	.09***
	(.01)	(.01)
Social trust *(V47)*	.02*	.02***
	(.01)	(.01)
Values		
Materialist[a]	-.05***	-.05***
	(.01)	(.01)
Post-materialist[b]	.12***	.12***
	(.02)	(.03)
Interaction effects		
Social trust*Political trust	-.011*	
	(.005)	

Environmental values*Political trust		.001
		(.01)
Individual-level controls[c]	included	included
Level 2		
Current tax-level	-.01	-.01
	(.01)	(.01)
QoG	-.17	-.13
	(.20)	(.20)
Constant	2.64***	2.60***
	(.18)	(.18)
Random effects		
Constant (country intercepts)	.05***	.05***
	(.01)	(.01)
Social trust	.002*	
	(.001)	
Environmental values		.01*
(post-materialist)		(.005)
Log likelihood	-63546.02	-63560.93
AIC	63598.02	63612.93
N (Level 1)	26472	26472
N (Level 2)	32	32

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: World Values Survey – Fifth Wave (2005-2009) and QOG Basic Cross-Section Data 2015.*

TABLE 4. ALTERNATIVE OPERATIONALIZATIONS OF SOCIAL AND POLITICAL TRUST, AND INTERACTION TERMS WITH POLITICAL TRUST (ISSP DATA)

DV: Public support for green taxes	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Fixed effects						
Level 1						
Political trust *(V14)*	.13***	.12***	.13***	.12***	.13***	.12***
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Social trust *(V11)*	.16***	.14***	.15***	.13***	.16***	.14***
	(.01)	(.01)	(.02)	(.02)	(.01)	(.01)
Values						

Materialist[a]	-.18***	-.13***	-.18***	-.13***	-.17***	-.13***
	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)
Post-materialist[b]	.29***	.20***	.29***	.19***	.31***	.21***
	(.03)	(.03)	(.03)	(.03)	(.05)	(.05)
Interaction effects						
Social trust*Political trust			.02**	.02**		
			(.01)	(.01)		
Environmental values*					.04	.04
Political trust					(.03)	(.03)
Individual-level controls[c]	excluded	included	excluded	included	excluded	included
Level 2						
Current tax-level		-.001		-.001		.003
		(.01)		(.01)		(.01)
Real GDP per capita (log)		.01				
		(.14)				
QoG		.66		.71*		.53
		(.49)		(.30)		(.57)
Constant	2.53***	1.59***	2.52***	1.55***	2.53***	1.61***
	(.05)	(.24)	(.05)	(.24)	(.06)	(.22)
Random effects						
Constant (country intercepts)	.07**	.06**	.07**	.07**	.08**	.07**
	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)
Social trust			.005*	.006*		
			(.002)	(.002)		
Environmental values *(post-materialist)*					.03	.04*
					(.02)	(.02)
Log likelihood	-44835.61	-44108.41	-44788.28	-44051.01	-44818.20	-44083.21
AIC	44849.61	44162.41	44808.28	44109.01	44838.20	44141.21
N (Level 1)	14479	14479	14479	14479	14479	14479
N (Level 2)	26	26	26	26	26	26

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: International Social Survey Programme – Environment III 2010 and QOG Basic Cross-Section Data 2015.*

Table 5. Alternative model 2: real GDP per capita vs. QoG (ISSP DATA)

DV: Public support for green taxes	**Model 2**	**Model 2**
Fixed effects		
Level 1		
Political trust *(index)*	.15***	.15***
	(.01)	(.01)
Social trust *(index)*	.13***	.13***
	(.01)	(.01)
Values		
Materialist[a]	-.13***	-.14***
	(.02)	(.02)
Post-materialist[b]	.22***	.22***
	(.03)	(.03)
Individual-level controls[c]	included	included
Level 2		
Current tax-level	-.002	.003
	(.01)	(.01)
Real GDP per capita		.16
		(.09)
QoG	.66*	
	(.30)	
Constant	1.57***	.42
	(.24)	(.90)
Random effects		
Constant (country intercepts)	.06**	.07**
	(.02)	(.02)
Log likelihood	-43998.48	-44000.22
AIC	44050.48	44052.22
N (Level 1)	14479	14479
N (Level 2)	26	26

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: International Social Survey Programme – Environment III 2010 and QOG Basic Cross-Section Data 2015.*

Table 6. Model 6 without Mali and Morocco (WVS DATA)

DV: Public support for green taxes	**Model 6**
Fixed effects	
Level 1	
Political trust *(index1)*	.08***
	(.01)
Social trust *(V47)*	.02**
	(.01)
Values	
Materialist[a]	-.06***
	(.01)
Post-materialist[b]	.12***
	(.02)
Interaction effect	
Social trust*Political trust	-.01*
	(.004)
Individual-level controls[c]	included
Level 2	
Current tax-level	-.01
	(.01)
QoG	.04
	(.17)
Constant	2.48***
	(.16)
Random effects	
Constant (country intercepts)	.04***
	(.01)
Social trust	.001*
	(.001)
Log likelihood	-60979.70
AIC	61031.70
N (Level 1)	25474
N (Level 2)	30

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: World Values Survey – Fifth Wave (2005-2009) and QOG Basic Cross-Section Data 2015.*

Table 7. Model 6 without Mali (WVS DATA)

DV: Public support for green taxes	**Model 6**
Fixed effects	
Level 1	
Political trust *(index1)*	.08***
	(.01)
Social trust *(V47)*	.02***
	(.01)
Values	
Materialist[a]	-.05***
	(.01)
Post-materialist[b]	-.08
	(.03)
Interaction effect	
Environmental values*QoG	.30*
	(.12)
Individual-level controls[c]	included
Level 2	
Current tax-level	-.01
	(.01)
QoG	-.08
	(.20)
Constant	2.53***
	(.17)
Random effects	
Constant (country intercepts)	.04***
	(.01)
Environmental values	.01*
(post-materialist)	(.004)
Log likelihood	-62301.29
AIC	62353.29
N (Level 1)	25919
N (Level 2)	31

**p<.05 **p<.01 ***p<.001. Standard errors within parentheses. Political trust and social trust are standardized and centered variables. Real GDP per capita and personal income are log-transformed. a: reference category – post-materialist or mixed; b: reference category – materialist or mixed; c: see main text. Source: World Values Survey – Fifth Wave (2005-2009) and QOG Basic Cross-Section Data 2015.*

Appendix C. Lists of countries and number of respondents

TABLE 1. LIST OF COUNTRIES AND NUMBER OF RESPONDENTS PER COUNTRY (WVS DATASET)

Country	Number of respondents	Data collection
Australia	1124	Face-to-face interviews
Brazil	1215	Face-to-face interviews
Bulgaria	511	Face-to-face interviews
Burkina Faso	638	Face-to-face interviews
Canada	1289	Face-to-face interviews
Chile	566	Face-to-face interviews
Cyprus	910	Face-to-face interviews
Ethiopia	1014	Face-to-face interviews
Finland	785	Face-to-face interviews
Ghana	691	Face-to-face interviews
Hungary	713	Face-to-face interviews
Indonesia	1109	Face-to-face interviews
Japan	481	Face-to-face interviews
Mali	553	Face-to-face interviews
Moldova	703	Face-to-face interviews
Morocco	445	Face-to-face interviews
Norway	909	Face-to-face interviews
Peru	910	Face-to-face interviews
Poland	520	Face-to-face interviews
Romania	668	Face-to-face interviews
Slovenia	529	Face-to-face interviews
South Africa	1911	Face-to-face interviews
South Korea	1047	Face-to-face interviews
Sweden	719	Face-to-face interviews
Switzerland	892	Face-to-face interviews
Thailand	1363	Face-to-face interviews
Trinidad and Tobago	588	Face-to-face interviews
Turkey	952	Face-to-face interviews
Ukraine	377	Face-to-face interviews

United States	929	Face-to-face interviews
Uruguay	631	Face-to-face interviews
Zambia	684	Face-to-face interviews
Total: 32	26374	

Data: World Values Survey – Fifth Wave (2005-2009).

TABLE 2. LIST OF COUNTRIES AND NUMBER OF RESPONDENTS PER COUNTRY (ISSP DATASET)

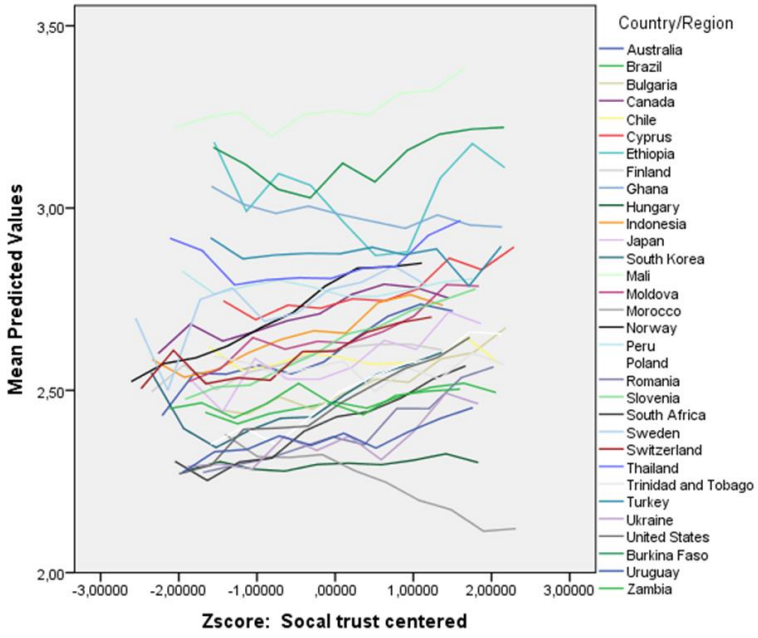
Country	Number of respondents	Data collection

Austria	447	Face-to-face interviews
Belgium	826	Mixed mode
Bulgaria	462	Face-to-face interviews
Canada	525	Self-completion questionnaire
Chile	276	Face-to-face interviews
Croatia	104	Face-to-face interviews
Czech Republic	495	Face-to-face interviews
Denmark	795	Mixed mode
Finland	445	Mixed mode
France	930	Self-completion questionnaire
Latvia	171	Face-to-face interviews
Lithuania	169	Face-to-face interviews
New Zealand	596	Self-completion questionnaire
Norway	889	Mixed mode
Philippines	157	Face-to-face interviews
Russia	666	Face-to-face interviews
Slovak Republic	376	Face-to-face interviews
Slovenia	281	Face-to-face interviews
South Africa	1458	Face-to-face interviews
South Korea	840	Face-to-face interviews
Spain	606	Face-to-face interviews
Sweden	697	Self-completion questionnaire
Switzerland	473	Face-to-face interviews
Turkey	698	Face-to-face interviews
Great Britain/United Kingdom	459	Mixed mode
United States	638	Mixed mode
Total: 26	14479	

Data: International Social Survey Programme – Environment III 2010.

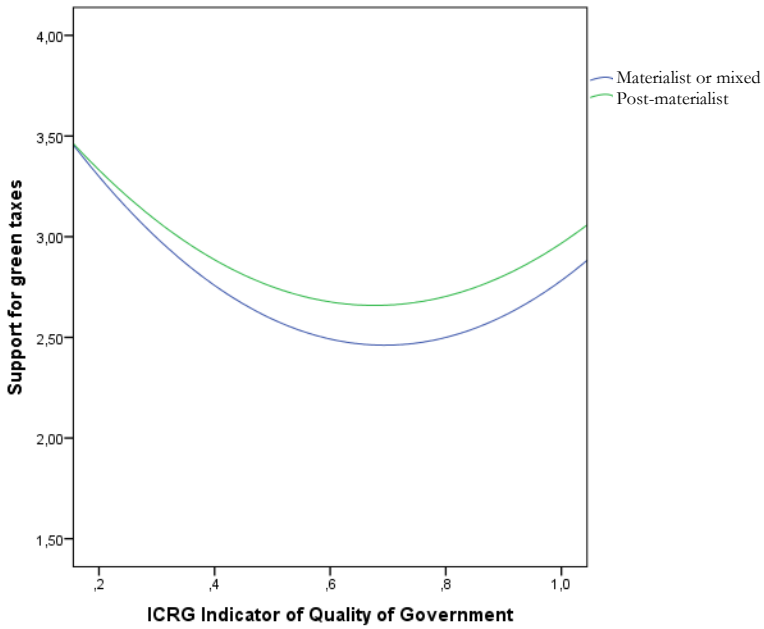
Appendix D. Graphs and illustrations of findings

FIGURE 1. RANDOM EFFECT OF SOCIAL TRUST ACROSS 32 COUNTRIES (WVS DATA)



Data: World Values Survey, Fifth Wave (2005-2009).

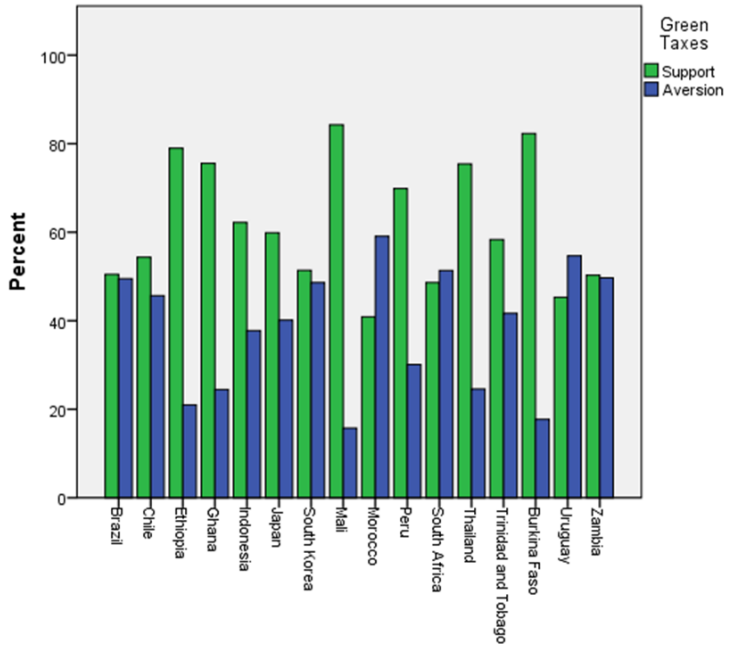
Figure 2. Interaction between values, QoG and support – Mali included (WVS data)



Data: World Values Survey, Fifth Wave (2005-2009), and QOG Basic Cross-Section Data (2015).

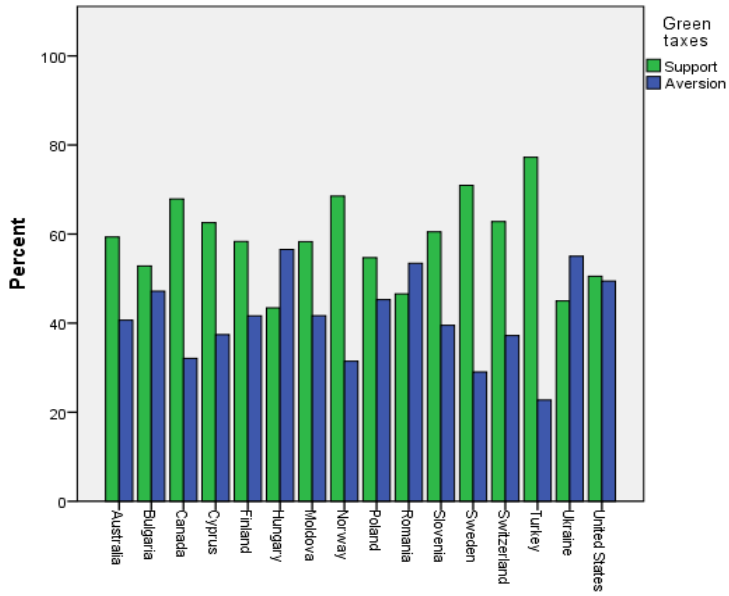
VESTERN AND NON-EUROPEAN DEVELOPING

TA)



Data: World Values Survey, Fifth Wave (2005-2009).

FIGURE 4. SUPPORT FOR GREEN TAXES IN WESTERN AND EUROPEAN COUNTRIES (WVS DATA)



Data: World Values Survey, Fifth Wave (2005-2009).