GÖTEBORGS UNIVERSITET

DEPARTMENT OF POLITICAL SCIENCE

TRUST, VALUES AND QUALITY OF GOVERNMENT

A multilevel cross-country investigation of public support for environmental taxes

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Master's Thesis:	30 higher education credits
Programme:	Master's Programme in International Administration and Global Governance
Date:	May 20, 2016
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Words:	19985

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 institutions (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 with green values are more likely to support environmental taxes if they live in high QoG countries. The effect of social trust on support for green taxes, however, appears to be contingent on individual-level political trust rather than the quality of government institutions. These interactions are encouraged to be further explored, since they appear to vary across countries and datasets. Some explanations for public support for green taxes might not hold in all contexts, as is illustrated by findings here. While support for environmental taxes is found to be relatively high in some developing countries, low QoG in these contexts might cause low compliance in practice. Internationally, public aversion towards higher taxes to protect the environment is still relatively high.

Keywords: Environmental taxes, public support, policy acceptance, second-order social dilemmas, political trust, social trust, post-materialist values, quality of government, developing countries, non-Western/European contexts, random effects, interactions.

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1. Introduction

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 firms or industries (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 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: 2183). 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: 2183). 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 2015; Kollmann & Reichl 2013; Harring & Lapuente forthcoming 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[1]; causing low compliance with public policies and demands for stricter regulations instead (Frey & Torgler 2007; Aghion et al. 2010). Moreover, considering the differing levels of economic development and environmental health[2], we can expect public acceptance of environmental taxes to differ across countries. Depending on the context in which individuals live, attitudes towards implementing such policy tools are likely to vary, resulting in cross-country differences in public support and possible obstacles for effective implementation.

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 and Van den Bergh 2015 for overview), none or at least very few studies have looked at potential "interaction effects" (Fairbrother 2015 and Harring & Lapuente forthcoming are

[1] A term that is often used when referring to individual's intrinsic willingness to pay taxes (Alm & Torgler 2006).
[2] Two factors that are important to take into account in an analysis of public support for green taxes, but they are not the main focus of this paper (see section 4.4.3).

two exceptions). This might be a reason why the existing 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 (2015), investigating support for environmental protection, found that the effects of social and political trust vary cross-nationally[4], but does not provide any explanations. By exploring interactions or "random effects" we can discover whether some factors matter more in certain contexts, and why this is the case. For example, is the effect of people's values or social trust on support for higher taxes to protect the environment contingent on the perceived quality of public institutions (QoG[5])? 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 social trust. From existing literature and arguments made by environmental economists, we have reasons to believe that the effects of values and trust, and the performance of environmental taxes, are dependent on economic conditions and institutional context. Further exploring these effects 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 for policy recommendations on how to increase public support for green taxes. In a sense, it is politically relevant since successful policies can increase both satisfaction with and trust in political leaders, which helps create 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. It is reasonable to believe that effects of individual-level factors on public support for green taxes will depend on certain country-level factors, or that interactions exist between individual-level factors. Three explanatory factors are the focus of this thesis: political and institutional trust, generalized trust in other people (i.e. social trust), and people's pro-environmental value orientation.[6] Assuming it is possible that the impacts of these factors are contingent on other factors on the individual or

[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).

[4] He shows that political trust is more strongly associated with support for environmental protection than social trust in some countries; whereas in other countries social trust is more important.

[5] In this paper, QoG refers to the capacity of a state to perform its activities in an efficient, fair and impartial manner, and without corruption.

[6] See sections 3.2.1 to 3.2.3 for definitions and further elaboration on these particular factors.

country level, 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. Political trust and social trust are two of them, which 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 & Jagers 2013 are one exception, but they only explore attitudes of individuals in Sweden).

To summarize, this study will contribute to the existing literature by: 1) further testing the explanatory power of factors previously analyzed mainly in Western or European countries, in developing countries and emerging economies outside these contexts[7], 2) examining differing effects of factors across countries with high and low levels of QoG or economic development internationally, 3) studying trust and values in tandem, 4) investigating interaction effects that have been almost entirely left out in previous research, and 5) testing different measures of explanatory factors. 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 datasets are used as robustness checks, and to be able to investigate whether different operationalizations of the main variables matters for the final 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 caused by contextual factors. For this purpose 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.

[7] Specifically, the three main factors that are the focus of this study: political trust, social trust and values.

2. Environmental taxes and why public support[8] 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: 185; see also Tietenberg 1990; Sterner 2012). The latter measures are still considered the dominant tools in environmental policy, while the former are mainly discussed in terms of distributional effects and influences on competitiveness in the market (OECD 2006, 2010, in Kollmann & Reichl 2013: 2). 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: 13). 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: 99f). The logic behind imposing the tax is that as the price for certain activities increase, people's incentive to change their behavior in a more sustainable direction will also increase (Harring & Jagers 2013: 213; Harring 2014a: 119). The argument, based on economic theory, is that imposing taxes on polluting activities will reduce environmental damage in the most efficient

[8] 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.

way, by encouraging households and firms that can reduce pollution at 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: 705).

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: 705). For these reasons, it is important for policymakers to understand which factors influence public attitudes towards (environmental) policies in general and, as in this case, environmental taxes in particular. This might help reveal under what conditions they are considered legitimate to the public; making them politically feasible (see Kallbekken & Aasen 2011: 2183). In some contexts green taxes might not be politically feasible, however, considering individual- and country-level factors that were mentioned in the introduction. 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: 1).

3. Theoretical framework and literature review

3.1 Social dilemmas and willingness to pay higher 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, 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 2015: 5). In order to induce these 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 the policies or sanctioning systems imposed by the state. If the imposed 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: 22).

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.[9] 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

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

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 2015: 5). 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 2015: 5). 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).[10]

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, i.e. 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

[10] 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.

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 sub-sections 3.2.1 to 3.2.3. 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.

3.2 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.

3.2.1 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, i.e. to 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: 615). Sønderskov (2009) argues that generalized social trust[11] 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.

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

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[12], 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: 23). If people cannot agree to act collectively, or if they do not trust others to cooperate for the common good, they are likely to support some kind of policy instrument that is imposed from above.

While low trust in others to cooperate and engage in activities for environmental protection could generate demand for environmental taxes[13], 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: 215). Hammar, Jagers and Nordblom (2009), for example, found 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 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).

[12] 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.

[13] At least in high QoG country contexts, as was suggested in section 3.1 (see also the next paragraph).

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. Harring and Lapuente (forthcoming) explore interactions between social trust, QoG and demands for government regulation, and find that the effect of social trust on public demand for government regulations depends on the level of QoG. They show that individuals with low levels of social trust demand more government regulations only at high levels of QoG. It is reasonable to believe that the same applies to environmental taxes; i.e. that 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 (see also section 3.1).

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 2015). 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.

3.2.2 Political and institutional trust[14] 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: 120). Even though people might have very strong green sympathies or concern for the environment, they can still choose to refuse to accept pro-environmental instruments. People's attitudes towards political steering and their view of the authorities that are implementing the specific policy instrument

[14] 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.

also matter for people's willingness to accept pro-environmental, political initiatives (Harring & Jagers 2013: 214; Hammar & Jagers 2006). There is an extensive literature on how political trust, or QoG, affects public support for state intervention. For example, it has been 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 public attitudes towards higher taxes and government spending, found that the perceived effectiveness and fairness of government officials has a strong independent effect on such attitudes. He shows that support for welfare and redistribution policies is greater in countries with high levels of QoG. People who live in societies with low levels of QoG, on the other hand, do not believe that the government and public administration have the capacity or necessary bureaucratic discretion required to carry out certain policies or reforms. It has been argued that policies requiring more bureaucratic discretion and government capacity, such as complex market-based policy tools, are less likely to be imposed by governments in corrupt countries, partly since the level of QoG affects public support for certain policies (Dahlström et al. 2013). At low levels of QoG, people might be unsure of how revenues will be spent or believe that resources will be wasted due to inefficiency and corrupt practices. This, following how the issue is framed, can be related to political 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 place, people will not support implementation of taxes[15] despite their strong pro-environmental beliefs (Harring 2014b: 21). 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 2015: 5). Research has to some extent confirmed these arguments by showing that corrupt political institutions generate aversion towards economic incentives (e.g. Harring 2015), and several studies have found that in countries with corrupt and inefficient public institutions there is a strong demand for regulations instead (Aghion et

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

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. Harring and Lapuente (forthcoming) also find that people with low levels of political trust demand more government regulations, but that these people are less supportive of paying higher taxes for environmental protection. 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 and Nistotskaya 2013).[16] From this, we would expect people in high QoG countries to be more supportive of higher taxes to protect the environment, 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 2015). 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 able to accept an increase in taxes to protect the environment (Hammar & Jagers 2006, in Harring & Jagers 2013: 214).

3.2.3 Pro-environmental values[17] 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).

[16] 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.
[17] Refers to post-materialist values, and is used interchangeably with *environmental values* in this paper.

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 this theory[18], 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 VBN 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[19] (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: 86). The theory of post-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[20], 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).

[18] See, for example, Stern 1999 to learn more about the VBN theory.
[19] The post-materialist scale has not been used to measure values in relation to the VBN theory.
[20] It also affects, for example, political tolerance, racial attitudes and political participation (see Davis 2000).

Values can be considered 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.[21] 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.[22] Svallfors (2013), investigating public attitudes towards higher taxes and government spending, found that the effect 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.[23] At low levels of QoG, the results of his study show that people with egalitarian values in some cases want lower taxes than people with less egalitarian values.[24] If the same were true for people's pro-environmental values, we would expect the positive effect of post-materialist values to be stronger in high QoG countries. Based on the review in section 3.2.2, we could also expect people with green values to support higher taxes for environmental protection only if there is a trustworthy public administration in place. As is indicated in Svallfors study, and translated to this context, green values could have a negative effect on public support for taxes in low QoG countries.[25] In this case, QoG is expected to convert green values into support.

3.3 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 different country contexts. QoG has been suggested as the moderator that affects the original relationships on the individual level. QoG, as well as political and social trust, are expected to have direct effects on public support for environmental taxes. These relationships are illustrated in figures 1 and 2 below.

[21] 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.
[22] 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.
[23] The difference in support between egalitarians and others becomes more visible at high levels of QoG.
[24] 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.
[25] One argument for why similar results could apply to the environmental domain, is that both environmental and social welfare policies can be considered to provide public goods – environmental protection and social welfare (Harring 2014: 120). In both cases, there is a second-order social dilemma.

Figure 1. The interaction of values with QoG, and the effects of trust and QoG on acceptance of green taxes.

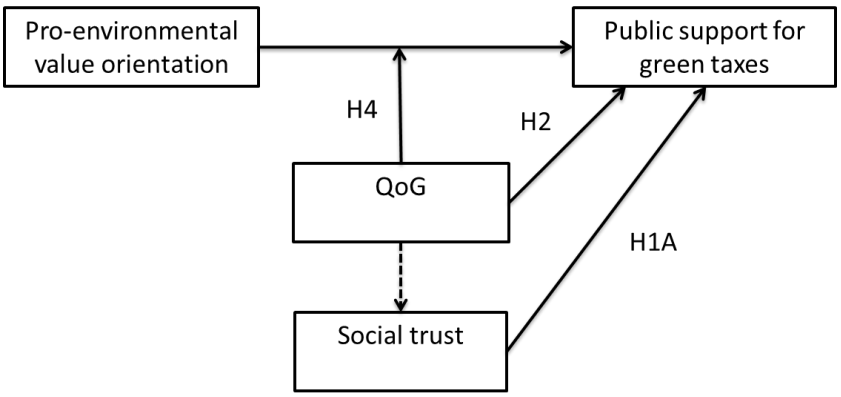
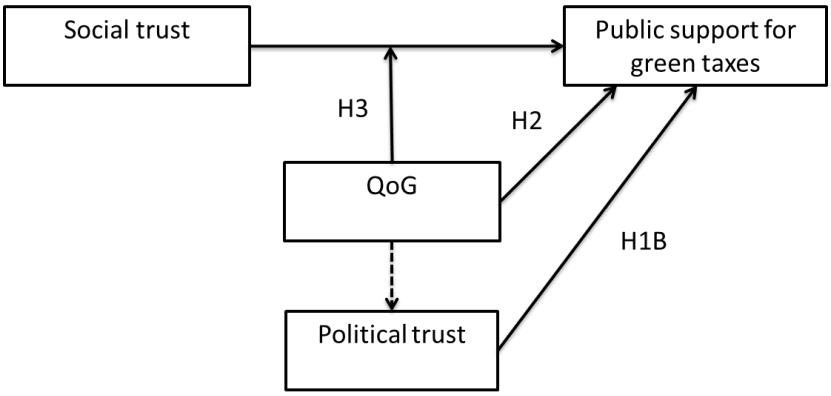


Figure 2. The interaction of social trust with QoG, and the effects of trust and QoG on support for green taxes.



Based on the theoretical models, five hypotheses in total can be derived. The first hypothesis has more or less already been established by scholars in previous research, but it has not been confirmed that the same explanations hold across a range of country contexts internationally.

H1A: Individuals with high levels of social trust are generally more supportive of higher taxes to protect the environment than individuals with low social trust.

H1B: Individuals with high levels of political trust are generally more supportive of higher taxes to protect the environment than individuals with low political trust.

In relation to the first hypothesis, a second hypothesis can be derived. Keeping in mind the commonly suggested relationship between QoG and levels of trust, people living in high QoG countries can be expected to be generally more supportive of environmental taxes.

H2: 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.

The third hypothesis concerns the contingent effect of social trust, and as was theorized this effect could depend on the perceived quality of government institutions. It was suggested that social trust will have a stronger positive effect on support for green taxes when QoG is high.

H3: The positive effect of social trust on public support for environmental taxes is stronger in countries with high levels of QoG.

Taking Svallfors (2013) as a main point of departure, a fourth hypothesis on the contingent effect of values can be derived. As was suggested by the findings in his study, and translated to this context, green values can be expected to have a stronger effect in high QoG countries.

H4: The positive effect of pro-environmental values on public support for environmental taxes is stronger in countries with high levels of QoG.

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 study is the exploration of interaction effects, and 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 effect of QoG and political trust when testing H3 and H4 to see if it produces different results.

4. Methodology, material and measures

4.1 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.[26] An important assumption in order for OLS regression to work (produce accurate results) is that the units of analysis or observations are independent from each other. When dealing with a large number of individuals that have been sampled from similar contexts, dependency in the data is likely. Contextual effects will cause individuals within one country to be very similar to each other, but different from individuals in other countries. To deal with this issue of dependence, we need to factor in correlations between individuals caused by higher-level contextual variables into our models. This should solve the problem of dependence between observations, or the dependence in errors, and give us more accurate estimations of regression parameters (incl. effect sizes) and residuals (Field 2013: 828). If the country specific (contextual) effects or the clustering of individuals are ignored, there is a risk that estimated regression parameters and standard errors will be biased (Guo & Zhao 2000; Hox 2002, in Harring 2014a: 122). Usually, standard errors are likely to be underestimated, and significance levels overestimated (Allison 2009, in Svallfors 2013: 370).

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, i.e. 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%. 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.[27] 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.

[26] The units of analysis in this study are individuals living in different country contexts.
[27] The rest of the contextual-level variation is explained by individual-level factors.

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 H3 and H4.

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 2015; Harring & Lapuente forthcoming). However, this type of method is tricky to use, especially with the software used in this paper, and would make the interpretation of the interaction terms more difficult. As an initial test, this study therefore applies a normal multilevel analysis approach, treating the categorical dependent variable as a continuous variable.[28] Yet, this comes at the cost of making the interpretation of the outcome variable more difficult, since we have to make a rather arbitrary decision about at what point on this new scale aversion towards green taxes turns into support (see section 4.4.1).

4.2 Assessing the validity of results

4.2.1 Multilevel models and regression diagnostics

Generally, to make sure that the results of our regression analyses are valid we should always check for things like linearity, normality, homoscedasticity, and independent errors. These are

[28] 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.

assumptions that apply to multilevel modeling as well.[29] By treating the categorical dependent variable as continuous, we do not have to worry about violations of the linearity assumption caused by the nature of the dependent variable. There is some indication of departure from the assumption of normally distributed errors (see Appendix E), but normality should preferably be checked for at both levels of the model separately. Homoscedasticity was not possible to diagnose, nor independence in errors. By applying a multilevel regression model the problem of dependence in errors should usually be solved, but it is still recommended to be checked for (Field 2013). Heteroskedasticity will not make my models biased, but it could be making them less efficient (Williams 2015).

4.2.2. Outliers and multicollinearity

Other things that could cause problems in multilevel models are potential outliers, which can affect the parameter estimates retrieved by the performed analysis. While individuals largely deviating from their country means should not be a problem, considering the large group sizes (see below), individual countries could be an issue. There was no specific graph using saved values that could be produced to identify potential outliers, thus simple histograms to identify countries with deviating means on the main predictor variables and dependent variable were screened. Two statistically significant outliers were found in the WVS dataset, while outliers were not checked for in the ISSP dataset. Considering the relatively small number of countries in the samples from both datasets, and since no difference in results was detected by removing them, outliers were not excluded from the final analyses. According to some scholars outliers should not be removed, particularly for the purpose of receiving wanted results.[30] In this case, no outliers were found to be driving the results at all and should not be of great concern.

Multicollinerity in relation to my models was assessed by using VIF and tolerance values that were produced using normal OLS regression. No case of multicollinearity could be confirmed using these statistics, but the strong correlation between QoG and real GDP per capita[31] was still proved problematic (see sections 6 and 4.4.3.2). Multicollinearity caused by inclusion of interaction terms, and is detected by relatively high VIF and low tolerance values, does not affect the significance of interaction terms, or the coefficients of other variables included in

[29] Conducting diagnostics in relation to multilevel models is more complex, and the software used in this paper is unfortunately limited in this respect.
[30] Outliers that are identified as exerting influence on results should not be removed from the regression analysis but rather further investigated to understand why they do not fit the model (Field 2013: 309). Here, influence of outliers could not be examined by using various statistics; only results with and without outliers.
[31] The correlation in both the WVS (.778) and ISSP (.836) datasets is strong.

the models. Hence, this kind of multicollinearity does not have any adverse consequences for the analysis and can be safely ignored (Allison 2012).

4.3 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 in particular the economic development or QoG of these countries), and the group sizes (i.e. the number of individuals living in each country) should not be too small (Kreft & de Leeuw 1998, in Field 2013: 829). 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.[32] 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 relatively larger sample including people from diverse contexts in the WVS dataset makes the results of this analysis a bit more robust, but the results from the ISSP data should nevertheless be considered as equally valid.[33]

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

[32] For complete lists of countries and number of respondents see Appendix C.
[33] The larger the sample size, the smaller the standard errors will be; the more precise our estimates of the population value, and the more generalizable results will be to a larger population of individuals/countries.

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 in many different areas, trying to capture "large trends" among populations instead. Moreover, the WVS only uses face-to-face interviews, which could be a source of bias. The ISSP uses a mix of methods to collect their data across different countries, which could also be problematic.

There are enough survey questions in the ISSP and WVS datasets to capture my individual-level variables, but to capture my country-level variables these datasets were merged with the Quality of Government Basic Dataset (2015) – including measures of economic development, QoG, and current tax-levels. Due to availability of different survey questions in the ISSP and WVS datasets, it is possible to measure the main predictor variables using different indicators in order 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 no conclusions will be made about which measures are the "best" ones to use, based on results of the analyses in this paper. The operationalizations of the included variables are presented and discussed in the next sub-section, 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 of the things that we are trying to capture, but in some cases we have to use the "best" measures or proxies available in existing datasets.

4.4 Operationalization of variables

4.4.1 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"[34] 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

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

someone else should pay the taxes. These small differences in nuance between the two survey questions could potentially affect the outcome.[35] In any case, controls for current tax-levels are needed, mainly because the survey questions used to capture this variable are relativistic; they depend on current tax-levels of individual countries. To make them comparable I include a country-level control for current tax-level (see section 4.4.3.2). 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 not provide an accurate picture. In contrast to previous research, the two survey questions are used as concrete measures of support for green taxes.[36] There have been various uses of these questions before, including to measure general support for environmental policies, 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, i.e. a specific type of government intervention, considering the clear reference to taxes in both survey questions. One could ask whether they really measure support for taxes, but they are still the best measures available.

An alternative survey question from the WVS (that does not directly refer to taxes) was also considered: "The government should reduce environmental pollution, but it should not cost me any money".[37] 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 forthcoming). The survey question from the WVS used in this study 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 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

[35] 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.
[36] Kollmann and Reichl (2013) are one exception, using the same survey question from the ISSP to measure acceptance of environmental taxes.
[37] If assuming that a respondent who agrees with the statement implies tax aversion.

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.

4.4.2 Independent variables

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".[38] As has been argued, however, (Harring & Lapuente forthcoming) 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 (forthcoming), this study uses an index of three combined measures (index 1)[39] 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).[40] For both these indexes higher scores indicate higher political trust.

[38] This survey question is available in e.g. the Fifth Wave of the WVS.
[39] There is a weak correlation between this index and QoG (see figure 5, Appendix D).
[40] There is no correlation between this index and QoG (see figure 6, Appendix D).

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 2015: 9). 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.

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 has been criticized (e.g. Thöni et al. 2012) it is considered an established way of measuring social trust (Harring & Lapuente forthcoming: 9). 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.

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 tools – measuring people's pro-environmental values. In this study the latter measure is used, since survey questions related to Schwartz value scheme are only available in the WVS dataset. The post-materialist scale from both the WVS and ISSP datasets consists of four items, where respondents are asked to state what two issues should be the most important for their country. In the WVS survey 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 classified 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.

4.4.3 Controls[41]

4.4.3.1 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 forthcoming). 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

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

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 market-based mechanisms underlying such economic tools (Harring 2015: 10). 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 2015). 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 2015: 10). 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 2015). 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[42], 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.

4.4.3.2 Country level controls (and moderators)

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.[43] It is not included in the models with interaction terms since it would

[42] The correlation with household income is weak (.205) and with personal income moderate (.456).
[43] The advantage of real GDP per capita over normal GDP per capita is that it takes into account inflation.

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 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 2015: 9). Economic development could have a negative effect on support for taxes[44], 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.

Finally, 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".[45] 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

[44] 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.

[45] "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).

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: 368); the closest being trust 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 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.

5. Limitations of the study

This study only looks at support for environmental taxes in general as policy instruments for protecting the environment, not choices between different instruments[46] (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 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[47] (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 even if they might have stated that they are supportive of them.[48] The second-order free-riding problem is most likely

[46] This would, however, significantly complicate the interpretation of the interaction terms used in this study.
[47] We can only talk about associations, even if modeling varying effects can help in making causal inferences.
[48] 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

larger in low QoG countries, as was suggested in section 3.1. This explanation might be valid in the case of Mali, an identified outlier[49], where corruption has been described as widespread and systematic across all levels of society in the past (Transparency International 2008), and remains a big problem (Freedom House 2015). Other limitations have been discussed in the above sub-sections, mainly related to the measures used in operationalizing variables. With these limitations in mind, we now turn to the results of the analysis.

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 (Latinobarometro 2010: 83). 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).

[49] 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.

6. 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 interaction terms. Results with the alternative operationalization of political trust are presented in table 1 in Appendix B, and interactions with political trust are presented in tables 2 and 3 respectively. 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. The random effects of social trust and environmental values and the interaction with QoG.

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***	.08***	.08***	.08***	.08***	.08***
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Social trust	.03***	.02***	-.01	-.01	.03***	.02***
	(.01)	(.01)	(.03)	(.03)	(.01)	(.01)
Values						
Materialist[a]	-.06***	-.04***	-.06***	-.05***	-.06***	-.05***
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Post-materialist[b]	.15***	.12***	.15***	.12***	-.10	-.08
	(.02)	(.02)	(.02)	(.02)	(.07)	(.08)

Interaction effects						
Social trust*QoG			.06	.05		
			(.05)	(.05)		
Environmental values					.37*	.30*
*QoG					(.11)	(.11)
Individual-level controls[c]	excluded	included	excluded	included	excluded	included
Level 2						
Current tax-level		-.004		-.01		-.01
		(.007)		(.008)		(.008)
Real GDP per capita (log)		-.15**				
		(.05)				
QoG		.44	-.22	-.20	-.27	-.24
		(.29)	(.21)	(.20)	(.21)	(.21)
Constant	2.64***	3.51***	2.77***	2.65***	2.80***	2.68***
	(.04)	(.34)	(.13)	(.18)	(.13)	(.18)
Random effects						
Constant (country	.06***	.04***	.05***	.05***	.05***	.05***
intercepts)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Social trust			.002**	.002**		
			(.001)	(.001)		
Environmental values					.01	.01*
(post-materialist)					(.004)	(.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 Dataset 2015.*

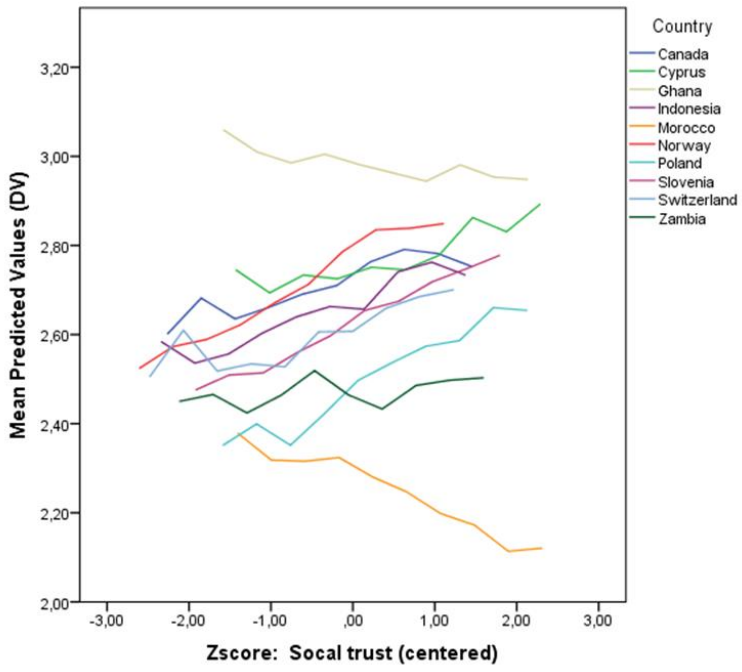
We can see that social and political trust and people's values are highly significant predictors of support for environmental taxes. People with higher levels of social and political trust are more supportive of taxes. Political trust has a bigger effect size than social trust, and when using the traditional 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.[50] 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 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[51], 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 below), 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.[52] 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. In figure 3 below, the varying effect of social trust across countries is illustrated by a few illustrative examples to make the graph easier to interpret (for graph including all 32 countries see figure 1, Appendix D).

[50] In models 3-6 this should not come as a surprise since QoG is part of the interaction term.
[51] Including such variables in our models would, according to Svallfors, "completely blur the picture" (see footnote 5, Svallfors 2013: 370).
[52] 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.



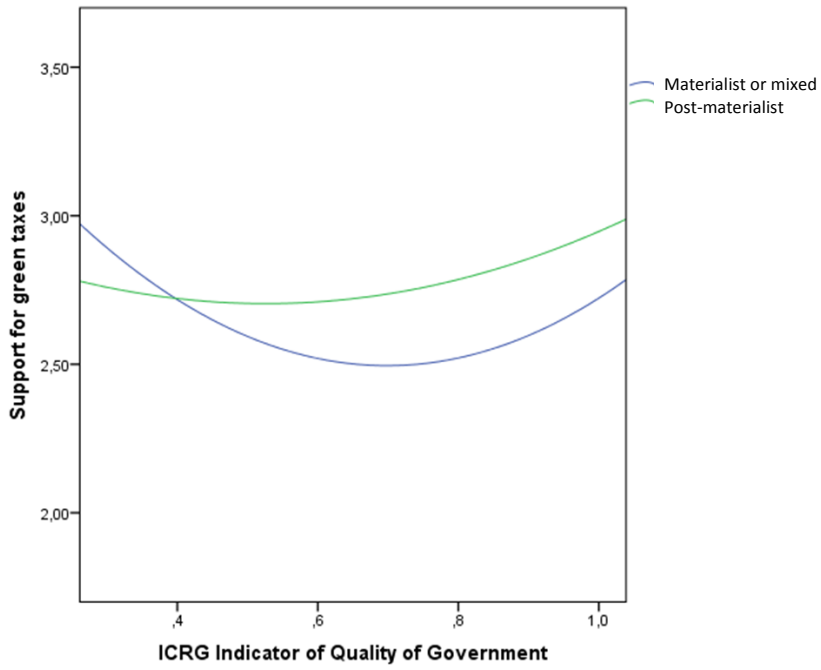
The graph shows the mean expected values on the dependent variable for each standardized score on the social trust scale for each country. From the graph, we can derive that people with similar scores on social trust in different countries have varying levels of support for green taxes. For example, 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.[53] 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.[54] 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 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,

[53] Recalling that value 3 on the dependent variable (y-axis in the graph), indicates support for green taxes.
[54] 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).

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 different 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.[55] 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.[56] 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. [57]

Figure 4. The interaction between QoG, values and public support for green taxes.[58]



[55] 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.
[56] The effect becomes positive when QoG is about 0.27; at this threshold the positive effect is weak (.001).
[57] Because of limitations in the software used, the marginal effect of values could not be displayed. Instead, the graph shows *trends*, i.e. the general level of support for green taxes among individuals holding different values.
[58] 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.

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.[59] 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 (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.[60] 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 is 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 results of the 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, Appendix B. The alternative operationalization of social trust cannot be motivated as better; the two-item index should be able to capture social trust better than the one-item measure if anything.

[59] 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.
[60] The high correlation with economic development should, however, be kept in mind.

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 (see section 4.4.2). The results presented in the table below are from the analysis including both two-item indexes of trust.

Table 2. Multilevel analysis using ISSP data. The random effects of social trust and environmental values and the interaction with QoG.

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***	.15***	.16***	.16***	.15***	.15***
	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Social trust *(index)*	.15***	.13**	.15*	.16*	.15***	.13***
	(.01)	(.01)	(.07)	(.07)	(.01)	(.01)
Values						
Materialist[a]	-.19***	-.13***	-.19***	-.14***	-.18***	-.13***
	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)
Post-materialist[b]	.32***	.22***	.31***	.21***	.42	.39
	(.03)	(.03)	(.03)	(.03)	(.22)	(.23)
Interaction effects						
Social trust*QoG			-.01	-.05		
			(.01)	(.09)		
Environmental values*QoG					-.12	-.20
					(.27)	(.28)
Individual-level controls[c]	excluded	included	excluded	included	excluded	included
Level 2						
Current tax-level		-.002		-.002		.003
		(.01)		(.01)		(.01)
Real GDP per capita (log)		.005				
		(.14)				
QoG		.65	.57*	.67*	.58*	.61
		(.49)	(.27)	(.30)	(.28)	(.31)
Constant	2.53***	1.57	2.11***	1.61***	2.10***	1.56***

	(.05)	(1.21)	(.21)	(.24)	(.21)	(.24)
Random effects						
Constant (country	.07**	.06**	.06**	.07**	.06**	.07**
intercepts)	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)
Social trust			.005*	.005*		
			(.002)	(.002)		
Environmental values					.03	.03*
(post-materialist)					(.02)	(.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 Dataset 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 in 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).[61] 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.[62]

[61] This holds when removing personal income, which has a strong correlation (.621) with real GDP per capita.
[62] 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.

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 in 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.[63] 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.

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 older model. Consequently, we cannot compare models without controls with models with controls. Comparing model 2 with models 4 and 6 we can derive that the model fit has improved by calculating the difference between the log-likelihood values and, based on the change in the degrees of freedom[64], compare this value to the critical values of the chi-square distribution. If the calculated difference is larger than the critical values we can say that the model fit has significantly improved by modeling the variability in slopes. This was also the case when the calculations were performed.

[63] 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.
[64] The number of parameters that have been estimated in the models.

7. 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, 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 when using alternative operationalizations. This was the case when using a combination of political trust measured as trust in politicians and social trust measured by the commonly used trust question.[65] Since the WVS data offers, as has been argued, 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[66] is much larger than the effect of social trust (Fairbrother 2015). 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 the 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.

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 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 consists mainly of individuals in European or Western contexts, the WVS sample of non-Western contexts is much more balanced. Since the WVS dataset 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

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

[66] 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.

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: 455). This causes large 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 analysis 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 interactions.

An interesting side note is that real GDP per capita was found to have a negative effect in the WVS dataset, i.e. that 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 (see section 4.4.3.2), economic development could 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 (see section 4.4.3.1). 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 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. Hence, 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 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 on the interaction between environmental values, QoG and support for green 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 illustration of the interaction effect, we cannot really see that the effect of values is negative at low levels of QoG, but the average effect of post-materialist values is positive at high levels of QoG (specifically when countries reach score 1 on the ICRG indicator). With better plots of marginal effects 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 instead, which indicates that perceived government quality is what matters here and not political trust.

In the discussion on the operationalization of QoG (see section 4.4.3.2), it was suggested that perceived QoG, i.e. individuals' perceptions of QoG, could be captured using political trust measured on the individual level or ICRG's indicator of QoG on a 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 found 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 interaction effects 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 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.

8. 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 interaction between perceived QoG and social trust and environmental values respectively and, additionally, to see whether different operationalizations of the main variables 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. In this study a normal multilevel analysis was used, but further research should apply a logistic multilevel analysis approach to see if the results are different. For this, software such as Stata or R should be used instead of SPSS, to be able to illustrate both random and marginal effects properly. Given the results of this study, the direct effects of QoG and economic development on public support for green taxes also need to be further investigated. QoG was not found to be a statistically significant predictor on its own using WVS data, which is odd 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 task that would require high methodological skills and innovative techniques, in a next step, would be to disentangle the effects of QoG and economic development on public support for environmental taxes. Perhaps this is even an impossible task.

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 – either its size or the country contexts included. It is 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 confirm 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 confirmed, 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 strong pro-environmental values. Why this is the case and at low levels of QoG where public institutions are perceived as corrupt and inefficient is, to say the least, 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 might be relatively highly supported in poor 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 the first-order collective action problem in all contexts. Until people are actually willing to accept and *pay* higher taxes for environmental protection in practice (i.e. to comply with imposed taxes), and public aversion is much lower than public support[67], other environmental policy tools might be more attractive and effective in changing people's non-environmental friendly behavior.

[67] Internationally, aversion towards green taxes is still relatively large compared to public support (see figure 3 and 4, Appendix). 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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Statistical data files:

WVS Fifth Wave (2005-2009): WV5_Data_spss_v_2015_04_18.zip retrieved from: http://www.worldvaluessurvey.org/WVSDocumentationWV5.jsp

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 A. Descriptive statistics

Table 1. Descriptive statistics WVS data

Variable	*Construct*	*Mean*	*Minimum*	*Maximum*	*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	2.25	1	4	0.72	World Values Survey (WVS)

	great deal" *(reversed scales)*					
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		1	5		World Values Survey (WVS)

	right", "Far right" *(transformed)*					
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	Real GDP per capita (2005)	17782.	781	55691	14711.21	Quality of Government

(gle_rgdpc)	*(log transformed)*	88				Institute (QoG)
Quality of government (icrg_qog)	International Country Risk Guide (ICRG) Index	0.62	0	1	0.20	Quality of Government Institute (QoG)

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*	*Minimum*	*Maximum*	*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?" "Very unwilling", "Fairly unwilling", "Neither willing nor unwilling", "Fairly willing", "Very willing" *(reversed scale)*	2.54	1	5	1.2	International Social Survey Programme (ISSP)
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	2.66	1	5	0.91	International Social Survey Programme (ISSP)

	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)*					
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 chance, or would	3.02	1	5	1.12	International Social Survey Programme (ISSP)

	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)

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. WVS Results using political trust index 2 (traditional measure)

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					.39**	.32*
*QoG					(.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	.06***	.04***	.05***	.05***	.05***	.05***
intercepts)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Social trust			.002**	.002**		
			(.001)	(.001)		
Environmental values					.01	.01*
(post-materialist)					(.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 Dataset 2015.*

Table 2. Alternative models 4 and 6 with WVS data using political trust index 1

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		.01
trust		(.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 Dataset 2015.*

Table 3. Alternative models 4 and 6 with WVS data using political trust index 2

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 Dataset 2015.*

Table 4. ISSP Results using alternative operationalizations of social and political trust, and interaction terms with political trust

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* Political trust					.04	.04
					(.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					.03	.04*
(post-materialist)					(.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 Dataset 2015.*

Table 5. Alternative model 2 with ISSP data: real GDP per capita vs. QoG.

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 Dataset 2015.*

Table 6. Model 6 with WVS data: without Mali and Morocco

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 Dataset 2015.*

Table 7. Model 6 with WVS data: without Mali

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 Dataset 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	

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	

Appendix D. Graphs and illustrations of findings

Figure 1. Random effect of social trust across 32 countries – WVS data

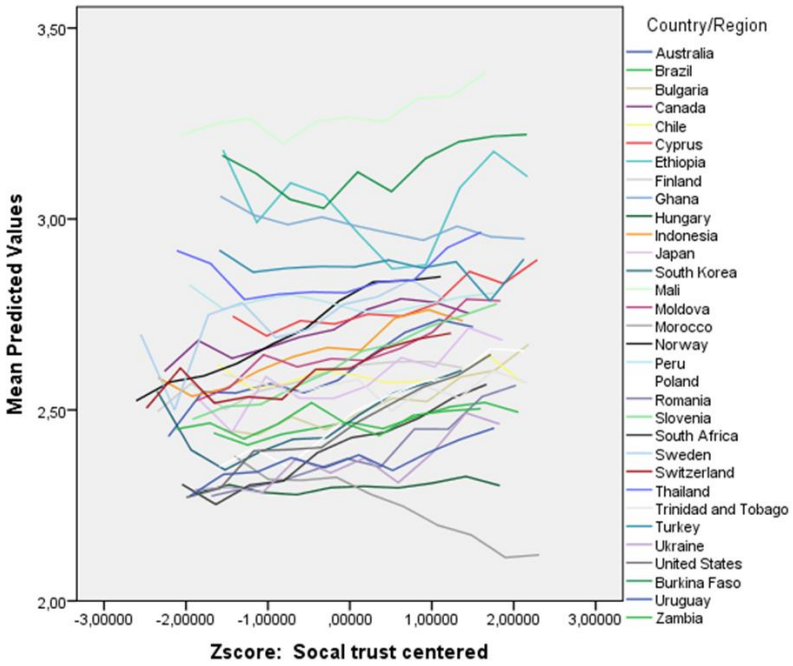


Figure 2. Interaction between values, QoG and support – WWS data, Mali included

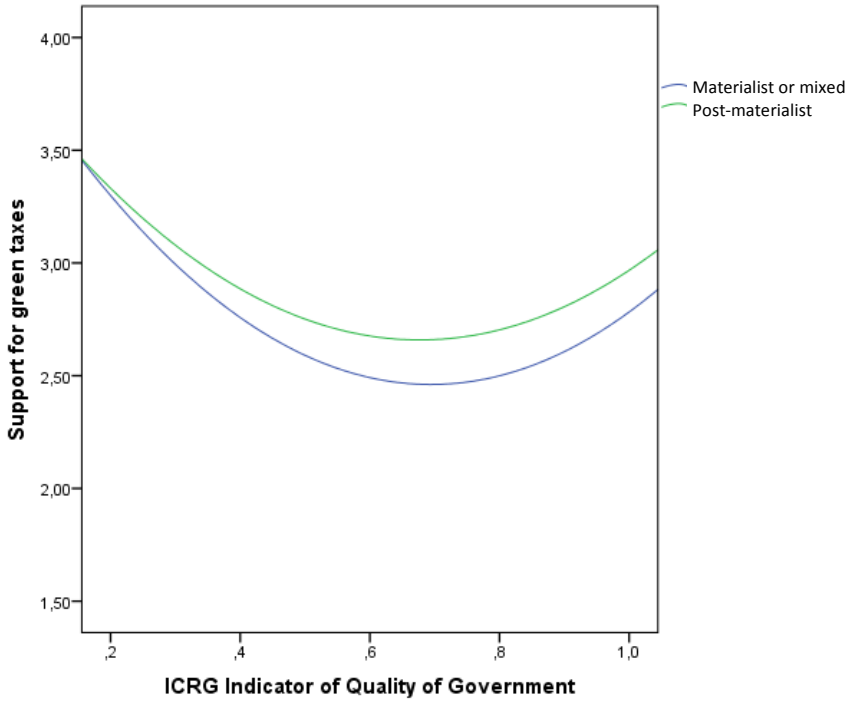


Figure 3. Support for green taxes in non-Western and non-European developing countries and emerging economies – WVS data

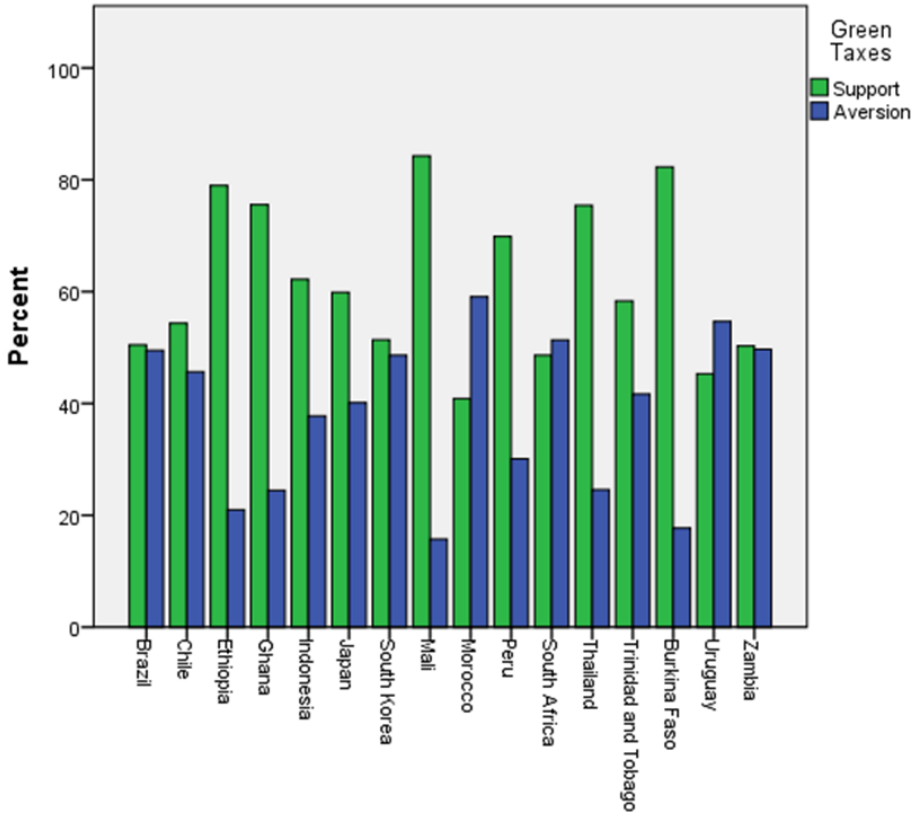


Figure 4. Support for green taxes in Western and European countries – WVS data

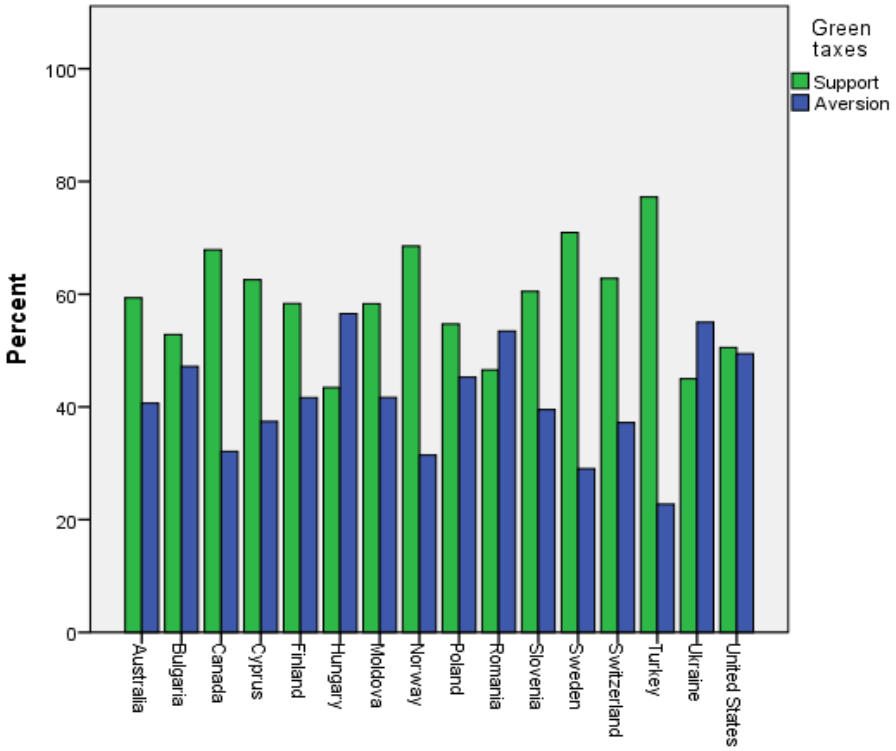


Figure 5. The correlation between political trust (index 1) and QoG

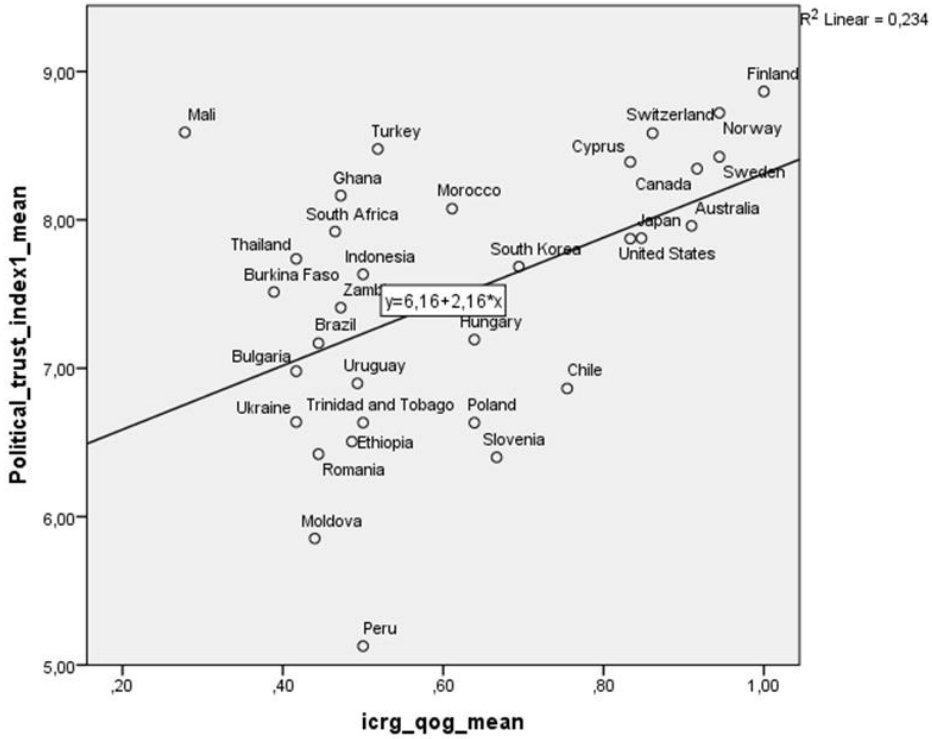
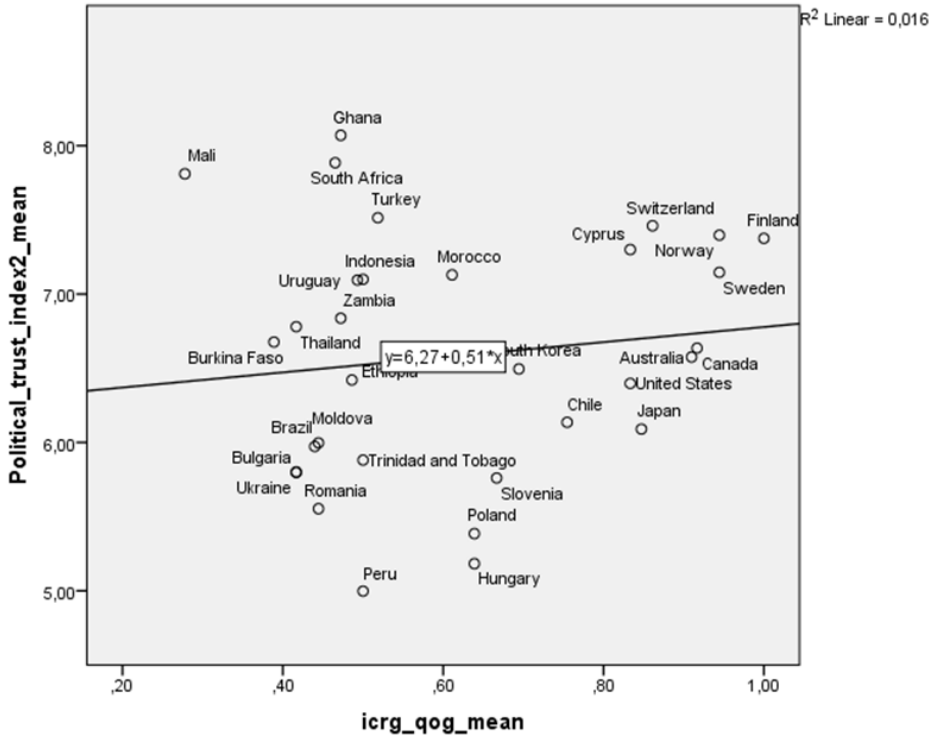
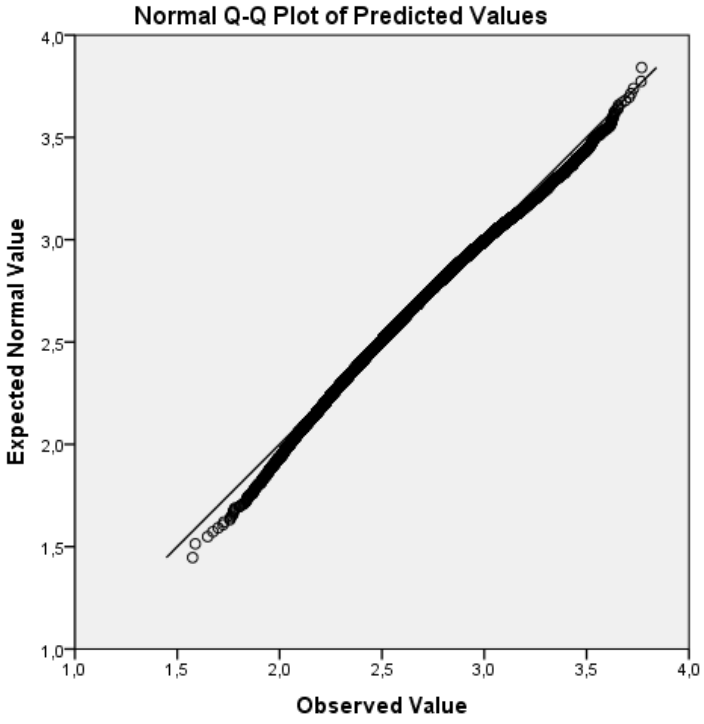


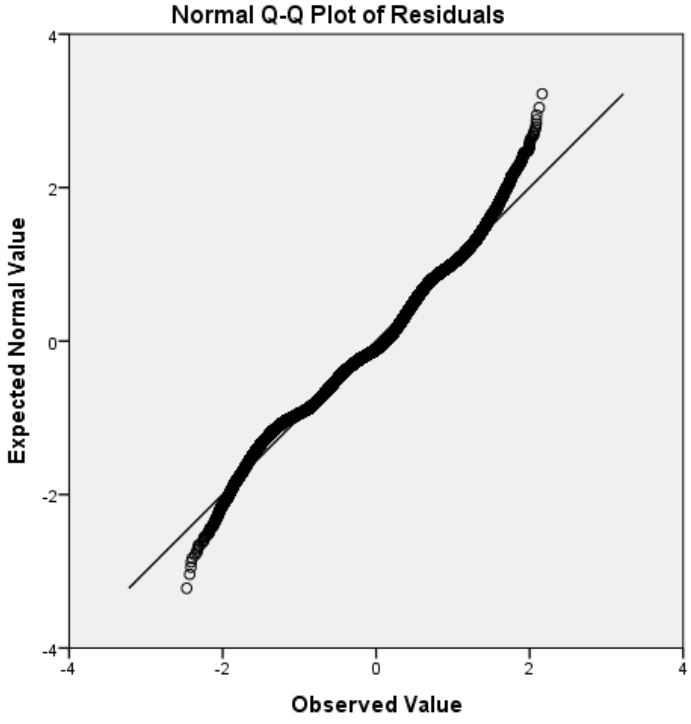
Figure 6. The correlation between political trust (index 2) and QoG



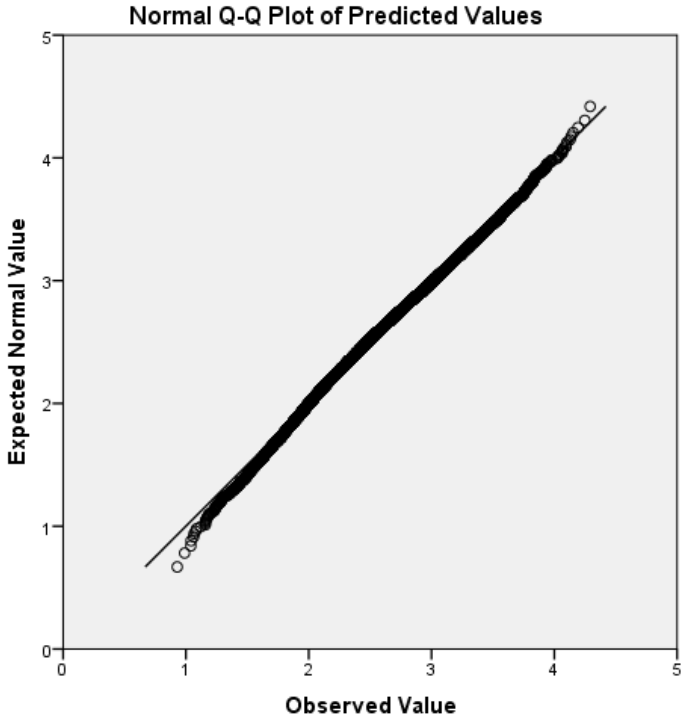
Appendix E. Diagnostics

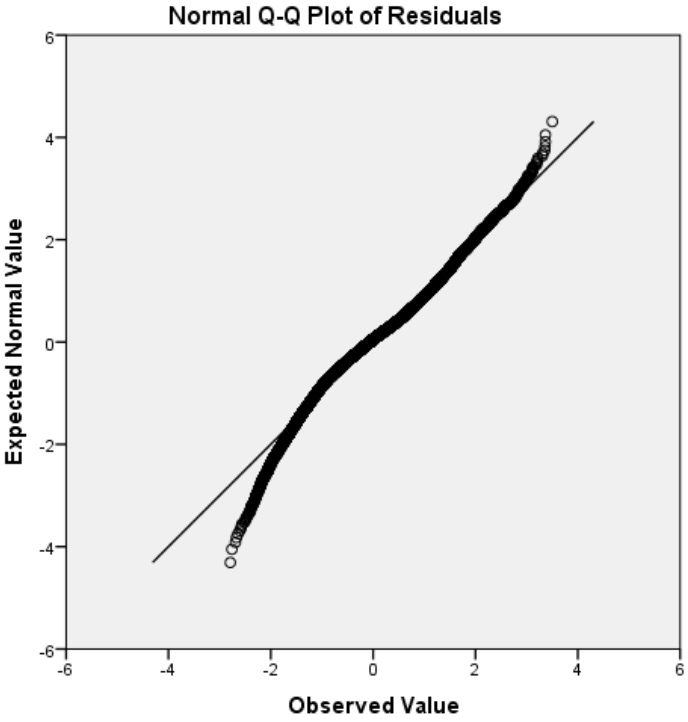
WVS data:





ISSP data:


Normal Q-Q Plot of Predicted Values
Expected Normal Value
Observed Value
0
1
2
3
4
5


Normal Q-Q Plot of Residuals
Expected Normal Value
Observed Value
-6
-4
-2
0
2
4
6