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Willingness to pay higher environmental taxes in selected European countries: An empirical analysis

Skłonność do płacenia wyższych podatków ekologicznych w wybranych krajach Europy: Analiza empiryczna

Abstract

Environmental taxes are increasingly recognized as a pivotal mechanism for promoting ecological sustainability. This study examines the willingness to pay higher environmental taxes, with a focus on non-economic factors across six European countries: France, Spain, Norway, Slovakia, Hungary, and Croatia, utilizing data from the International Social Survey Programme 2020 – Environment IV. The analysis revealed that respondents from France, Norway, and Spain demonstrated a greater willingness to pay higher green taxes compared to those from Slovakia, Croatia, and Hungary. Moreover, the findings indicate that environmental attitudes, such as environmental concerns, the perception of environmental threats, and the impact of environmental problems on everyday life, as well as education, followed by social and political trust, serve as important predictors of the willingness to pay higher ecological taxes. However, their influence varies across countries. These results underscore the importance of understanding country-specific characteristics to develop more targeted policies and strategies aimed at promoting ecological behaviors, particularly in enhancing support for environmental taxes.

Keywords: political trust, social trust, environmental tax, willingness to pay taxes, environmental concern.

JEL: D10, D91, H23, H71

Streszczenie

Podatki ekologiczne są coraz częściej postrzegane jako kluczowy mechanizm wspierania zrównoważonego rozwoju. Niniejsze badanie analizuje gotowość obywateli do płacenia wyższych podatków ekologicznych w oparciu o czynniki pozaekonomiczne w sześciu krajach europejskich: Francji, Hiszpanii, Norwegii, Słowacji, Węgrzech i Chorwacji, z wykorzystaniem danych International Social Survey Programme 2020 – Environment IV. Analiza wykazała, że respondenci z Francji, Norwegii i Hiszpanii charakteryzują się większą skłonnością do ponoszenia wyższych obciążeń z tytułu ekopodatków w porównaniu z osobami ze Słowacji, Chorwacji i Węgier. Wyniki wskazują, że stosunek do ekologii, w tym troska o środowisko, postrzeganie zagrożeń ekologicznych oraz wpływ problemów środowiskowych na codzienne życie, a także poziom wykształcenia, zaufanie społeczne i polityczne, są istotnymi predyktorami gotowości do płacenia wyższych podatków ekologicznych. Ich wpływ jednak różni się w zależności od kraju. Rezultaty badania podkreślają potrzebę uwzględniania specyfiki krajowej przy opracowywaniu polityk i strategii promujących proekologiczne zachowania, w tym zwiększenie poparcia dla ekopodatków.

Słowa kluczowe: zaufanie polityczne, zaufanie społeczne, podatek ekologiczny, skłonność do płacenia podatków, troska o środowisko.

JEL: D10, D91, H23, H71

1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) reports that, since the pre-industrial era, the Earth's climate has undergone significant changes, with substantial evidence indicating effects on both natural and human systems. These alterations have influenced various life forms and ecosystems, as well as human health and livelihoods (IPCC, 2018; World Economic Forum, 2024). Numerous environmental challenges stem from social dilemmas and insufficient joint efforts. These issues arise from scenarios where individuals' short-term gains from environmentally detrimental behaviors surpass the long-term losses experienced collectively (Bentley & O'Brien, 2015; Ostrom, 1998).

Addressing these large-scale collective action problems often requires the involvement of third-party actors and resources. Governments typically step in with policy interventions like environmental taxes and fees to facilitate collective solutions and mitigate the environmental impacts. Taxation acts as a key environmental policy tool, imposed on activities that adversely impact the environment. By increasing the costs associated with pollution-intensive goods and services, they serve to deter their usage (Aldy & Stavins, 2012). Additionally, the revenues from these taxes may be allocated to supporting and/or subsidizing ecological endeavors (Black & Heine, 2018). By taxing negative environmental externalities, governments promote numerous small-scale changes in the everyday choices of a wide range of economic actors (Delgado et al., 2022; OECD, 2021, 2023). The OECD reports the existence of over 1871 taxes and 620 fees related to environmental measures in 129 countries, targeting energy products, transportation services, projected pollution outputs, and resource management (OECD, 2023).

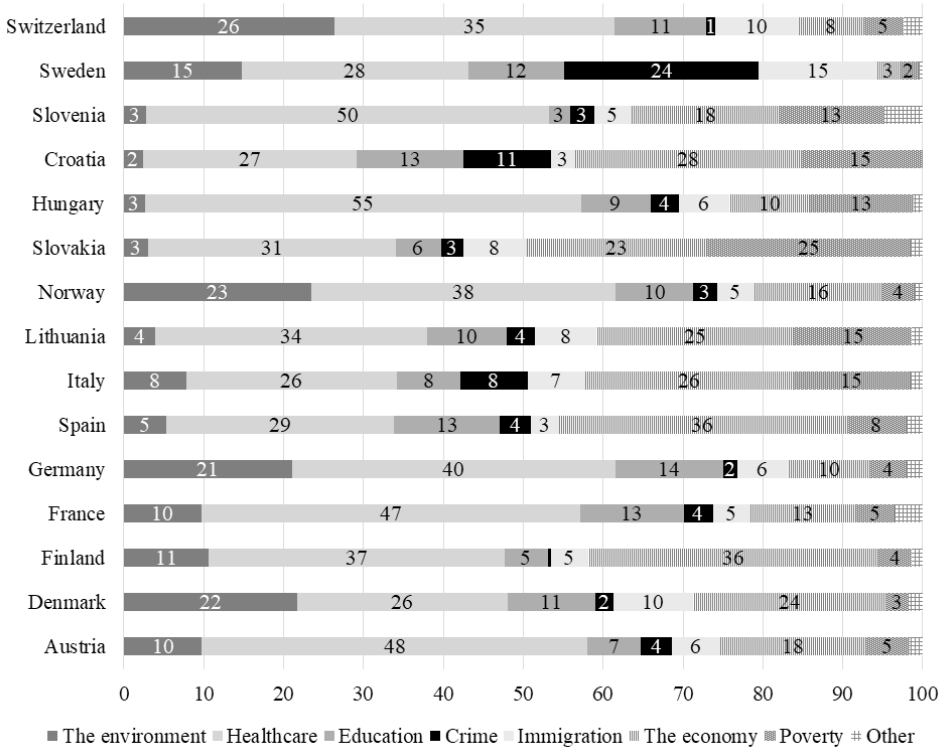
Environmental taxes play a crucial role in Europe, and in the EU in particular, significantly aiding in environmental preservation and bolstering local economies. In 2021, the EU Parliament enacted the EU Climate Law, making climate commitments legally obligatory for the EU. The implementation of the EU green initiatives is significantly facilitated by the revenues generated from environmental taxes (Villar Ezcurra & González-Orús, 2023).

Eurostat defines an environmental tax as one levied on activities with a clearly identified negative effect on the environment. It organizes environmental tax into four principal categories: energy, transport, pollution, and resource taxes (Eurostat, 2024; Villar Ezcurra & González-Orús, 2023). In 2021, the EU generated €331.3 billion in tax revenue, which made up 2.2% of the EU's GDP and 5.5% of the overall government revenue from taxes and social contributions. Taxes on energy in the EU accounted for 78% of the total revenue from environmental taxes, followed by taxes on transport – 18% and pollution and resources – 3.6%. Corporations contributed a significant portion of total environmental taxes, accounting for 49.3%, while households paid a nearly comparable share at 47.1%. Residents contributed to 3.4% of environmental taxes (Eurostat, 2023b). Using electricity as an example, since 2020, household total electricity prices have surged, peaking in the first half of 2023 at the highest levels ever recorded by Eurostat – €28.9 per 100 kWh. Tax contributions to total energy prices climbed from 31.2% in early 2008 to 41.0% by late 2019, then dropped to 15.5% by late 2022, with a slight increase to 21.8% in the

second half of 2023 (Eurostat, 2023a). The proportional decrease in environmental tax in 2020–2022 can be attributed to governmental fossil fuel subsidies and allowances, aimed at protecting businesses and citizens from rising energy costs, largely caused by COVID-19 and Russia's invasion of Ukraine (Eurostat, 2023b). Nevertheless, such interventions may compromise the goals of the EU's Environmental Action Programme. The EU has thus called for an immediate halt to fossil fuel subsidies (European Commission, 2023). This decision will likely impact household budgets, as seen in electricity prices increase in 22 EU Member States, with Dutch electricity bills soaring by 953% in the first half of 2023 (compared to the first half of 2022) after tax relief measures were removed (Eurostat, 2023a).

There is no doubt that the environment holds significant importance for the majority of Europeans. According to the Attitudes of Europeans Towards the Environment barometer, 84% of respondents concur that EU environmental legislation is essential for safeguarding the environment in their respective countries (Eurobarometer, 2024). Nevertheless, Deloitte's Global Sustainability Survey indicates that recent shocks related to the energy crisis, high inflation, the pandemic, and growing economic uncertainty have softened support for climate actions. The willingness to pay a "green premium" for sustainable products has decreased. Additionally, fewer people support governmental climate actions, are willing to participate in pro-climate rallies, switch to a more sustainable workplace, or report feeling worried about climate change (Deloitte, 2023). The results of the International Social Survey Programme 2020 – Environment IV showed that environmental issues, within the broader context of societal concerns, are rarely perceived by people as a top national priority (Figure 1). From a corporate perspective, Helene Geijtenbeek and Patrick van Min, Tax Partners at Deloitte, noted that, while companies are willing to take actions to achieve climate goals, they do not necessarily connect these actions with environmental taxes, or they do not do so sufficiently (Deloitte, 2024).

Figure 1.
The most important issue for the country, indicated by the percentage of responses (%), ISSP 2020



Note: Unweighted data. Question: Which of these issues is the most important for [country] today?

Source: The author's own analysis based on International Social Survey Programme 2020 – Environment IV (ISSP Research Group, 2023).

Public resistance to new and higher taxes often poses challenges, particularly when the execution of policies is accompanied by economic- and health-related difficulties, such as the energy crisis or the COVID-19 pandemic observed in Europe (Deloitte, 2023; Hartmann et al., 2022). While the public's stance is not the sole determinant of the success of environmental taxes, gaining a deeper insight into the determinants of willingness to support pro-climate initiatives, including supporting ecological taxation systems, is crucial for the effective execution of green government strategies and improved, sustainable environment for everyone. According to Tsiantikoudis et al. (2022) the importance of public opinion and the acceptance of such taxes is critical, as they can greatly influence the effectiveness of their implementation. They point out that in developed regions like the EU, the primary focus should be on addressing global environmental challenges through initiatives and actions, while shifting public attitudes and behaviors toward green taxation (Tsiantikoudis et al., 2022).

While the topic of sustainability attitudes, including the willingness to support or pay higher environmental taxes, has become increasingly prominent in scientific and public debates, there remains room for a better understanding of the differences between societies and how the willingness to pay evolves during times of crisis and uncertainty. Researchers suggest that the impact of various factors, including environmental attitudes, may differ across countries due to distinct cultural and national contexts (Povitkina, 2018; Urban & Kaiser, 2022).

The purpose of this article is to determine the factors influencing individuals' willingness to pay higher environmental taxes and the explanatory power of these factors, as well as to investigate the differences across selected European countries following EU climate legislation. The study is mainly grounded in compliance behavior theory, with a particular focus on non-economic internal and external factors. To best address potential differences in the willingness to pay higher green taxes between nations, this research has been conducted based on data from six European countries: France, Spain, Norway[1], Slovakia, Hungary, and Croatia. These countries represent different specifics, including geographical locations, levels of ecological tax rates, and attitudes and opinions towards environmental issues. The research primarily uses data from the International Social Survey Programme 2020 – Environment IV (ISSP Research Group, 2023) employing descriptive statistics, trend analysis, and logistic regression.

The aim of this paper is to address a series of pertinent questions: (1) What is the level and dynamics of the willingness to pay higher environmental taxes across the analyzed countries? (2) What are the main predictors of the willingness to pay higher ecological taxes? (3) What are the differences and similarities in the willingness to pay higher environmental taxes between countries?

The study contributes in several ways. First, it uses the latest data from the International Social Survey Programme 2020, conducted between 2019 and 2023 (depending on the country), thus accounting for the potential impact of the COVID-19 pandemic and the energy crisis. Second, it investigates the importance of non-economic factors in the context of tax compliance – an area suggested for further exploration by other authors (Alm, 2019), in this case with a particular focus on voluntary green tax compliance. Third, it identifies the strength of the determinants of willingness to pay higher green taxes for different countries and presents differences between them, which can contribute to a better understanding of the phenomenon in light of advancing EU environmental policies.

The paper is structured to first explore theories and frameworks that elucidate the determinants of willingness to pay green taxes. Subsequently, it looks at the methodology and the sources of data, paving the way for a presentation of the findings and conclusions.

[1] Norway is linked to the EU through the European Economic Area (EEA) Agreement. In 2019, Norway and the EU entered into an agreement under which Norway participates in EU climate legislation from 2021 to 2030 (Norwegian Ministry of Climate and Environment, 2022).

2. Theoretical framework of the research

A discussion on the willingness to pay higher environmental taxes falls within the broader framework of tax compliance concepts. Scholars emphasize that tax compliance is essential for maintaining economic stability, achieving policy goals, and providing public goods and services. In the case of green taxes, compliance is crucial for executing policies aimed at sustaining the environment, funding ecological initiatives, and encouraging environmentally friendly behaviors.

Tax compliance decisions can be linked to social dilemmas, where the decision whether to be compliant or not is based on the cost-benefit calculation. Individuals must choose between reducing their tax burden for immediate personal benefit or paying taxes to support long-term public gains (Gangl et al., 2015). To date, it has been widely researched that a simple cost-benefit approach cannot predict people's choices, including those related to paying taxes (Alm et al., 1995). Despite extensive research on tax compliance across various contexts, the question of why people voluntarily pay taxes remains only partially answered. This complexity arises because tax compliance is a multifaceted phenomenon influenced by not only economic, but also psychological, sociological, political, and even neurological factors (Randlane, 2016).

Kirchler et al. identify two main approaches to achieving tax compliance. The first approach depends on the power wielded by tax authorities, while the second is grounded in the trust the public has in these authorities. The power-based approach relies on an authoritarian stance, fostering a "cops and robbers" dynamic that enforces compliance. By contrast, the trust-based approach promotes a "synergistic atmosphere" where the government is perceived as a cooperative entity working in the public interest. This environment of high trust facilitates collaborative efforts between taxpayers and authorities, leading to voluntary compliance (Kirchler et al., 2008). Bătrâncea and Nichita further explore this concept by demonstrating that an antagonistic environment, characterized by mutual distrust, can result in non-compliance. They also suggest that when taxpayers face uncertainty regarding the potential rewards and losses associated with a proposed tax, their decisions are more likely to be influenced by emotions (Bătrâncea et al., 2012).

According to compliance behavior theory, tax compliance depends on both economic and non-economic factors (Randlane, 2016). Economic factors are primarily associated with rational considerations, guided by benefits and costs, the implementation of sanctions, and their severity. Non-economic factors, on the other hand, are not rational and include, for example, personal norms, morale, internal motivations, and social norms (Alm et al., 1995; Randlane, 2016; Torgler, 2007). These can be divided into external factors, such as trust in government, perception of democracy, social cohesion, and the complexity and fairness of the tax system and fiscal policy, and internal factors, where the willingness to pay taxes is determined by a knowledge and understanding of taxation, individual attitudes and beliefs, social norms, societal attitudes, and demographic factors (age, gender, education, social class etc.) (Frey & Torgler, 2007; Kirchler, 2007; OECD, 2010; Wan Mohd Azmi & Md Daud, 2024).

Trust in political institutions

One of the critical factors emphasized in the context of voluntary tax compliance, and identified in compliance behavior theory as a non-economic external factor, is trust in political authorities. Political trust, described by Sztompka as a cornerstone of societal functioning (Sztompka, 1999, p. 25), can be defined as the confidence citizens place in their political institutions. It involves reliance on the integrity and accuracy of these institutions and the belief that they make rational and well-considered decisions (Newton, 2007). The critical importance of trust in authorities for tax compliance has been highlighted by Hasan et al., who demonstrated that a lack of trust was a major reason for the failure of tax reform initiatives in Pakistan (Hasan et al., 2023). Other studies, both national and international, have also revealed that trust in tax institutions is positively related to tax compliance (Jolodar et al., 2019). For example, B. Torgler (2007) found that a positive relationship with the government, including trust in government, is a significant predictor of voluntary tax compliance (Torgler, 2007). Furthermore, research indicates that trust in government positively influences tax morale, the belief that paying taxes is a contribution to society (Horodnic, 2018; Torgler, 2007). In addition, numerous studies underscore the critical role of political trust in the effectiveness of public governance (Levi & Stoker, 2000; Torcal, 2014; Uslaner, 2002). Individuals who trust their government tend to adhere more readily to laws, regulations, and the tax system, even if certain policies or decisions do not fully align with their personal views (Exadaktylos & Zahariadis, 2014; Levi & Stoker, 2000; Svallfors, 2013; Taniguchi & Marshall, 2018). When trust in the government is high, individuals generally perceive new government initiatives and actions in a positive light. Studies exploring the relationship between political trust and pro-environmental behaviors uncovered that individuals who exhibit a high level of trust are more inclined to undertake environmental sacrifices, endorse eco-friendly policies or engage in proactive measures to combat climate change (Davidovic et al., 2020; Harring, 2013; Kollmann & Reichl, 2015; Lim & Moon, 2020). According to earlier studies, trust in the government can be an important factor in garnering support for environmental taxes and fiscal policies (Fairbrother, 2016, 2019; Kollmann & Reichl, 2015; Muhammad et al., 2021).

H1: *Political trust is an important predictor of willingness to pay higher environmental taxes.*

Trust in society

Social cohesion is another non-economic factor that can help explain people's willingness to pay higher green taxes. Defined as a desirable characteristic of a social entity (Schiefer & van der Noll, 2017), social cohesion encompasses both subjective aspects, such as trust or attitudes, as well as objective aspects, such as participation and crime rates (Chan et al., 2006). Social trust, which can be classified as a component of social cohesion, also referring to social norms, reflects a belief in the honesty, integrity, and reliability of others, and demonstrates faith in the goodwill of people (Boslego, 2005). Studies have demonstrated its significant impact on at-

titudes towards government interventions, acceptance of reforms, and tax systems (Habibov et al., 2017; Svallfors, 2013), including those concerning environmental policies and taxes (Davidovic et al., 2020; Harring, 2013, 2016). The core idea is that taxpayers are more willing to meet their tax obligations when they perceive the system as fair and trustworthy, and when they are confident that others are also contributing their fair share (Cahyonowati et al., 2023; Lange et al., 2017). Scholars have found that public willingness to support green taxes increases when there is a perceived societal backing for the implementation of environmental taxes. This support is further bolstered when the carbon tax is presented as a collective responsibility rather than an individual one (Adaman et al., 2011; Davidovic et al., 2020). The acceptance of green taxes can therefore be influenced by how these taxes are perceived in relation to community support, trust in fellow citizens, and the framing of tax responsibility as a collective endeavor.

H2: S*ocial trust is an important predictor of willingness to pay higher environmental taxes.*

Environmental attitudes

Finally, concerning internal factors, earlier studies have underscored the significance of environmental knowledge, attitudes and social norms in influencing the willingness to pay green taxes. Attitudes encompass, in particular, both emotional responses – such as feelings of guilt, sadness, or happiness associated with certain behaviors (affective attitudes) – as well as cognitive evaluations regarding the benefits of engaging in these behaviors (instrumental attitudes) (Breckler & Wiggins, 1989). In this context, the public's perceived severity of climate change, gauged by their concern and knowledge, plays a pivotal role in determining their willingness to support environmental initiatives (Davidovic et al., 2020; Poortinga et al., 2004). Studies have shown that environmental awareness, especially people's interest in environmental issues and their involvement in eco-friendly activities, influences their decisions to pay higher carbon taxes (Gupta, 2016). Moreover, it has been found that pollution negatively affects quality of life and happiness, making people more willing to pay taxes aimed at reducing pollution (Liu et al., 2018). When the public is informed and recognizes the issue of climate change, its adverse effects on the environment and its causes, support for environmental taxes increases (McLaughlin et al., 2019; Rotaris & Danielis, 2019). Therefore, the assumption is that the more aware and concerned people are about climate change, and the more engaged they are in environmental protection, the more likely they are to support higher environmental taxes.

H3: *Environmental attitudes are important predictors of willingness to pay higher environmental taxes.*

3. Research methodology

3.1. Analysis strategy

This research utilizes data from the International Social Survey Programme (ISSP) – Environment. The primary source for all the analyses is the 2020 edition of the ISSP survey, while the 2010 edition serves as a comparative reference point for assessing changes in willingness to pay over time (ISSP Research Group, 2019, 2023). The analysis was conducted based on six European countries: France, Spain, Norway, Slovakia, Hungary, and Croatia.

The research examines three analytical perspectives. First, it analyzes changes in the willingness to pay higher environmental taxes across selected countries by comparing mean values between the two ISSP editions: 2010 and 2020. Second, the average willingness to pay higher environmental taxes was compared between various groups within the selected countries based on ISSP 2020. Third, the explanatory power of selected variables in predicting the willingness to pay higher environmental taxes across the selected countries was analyzed using logistic regression (binary response model).

To distinguish between those willing to pay higher green taxes and those with a neutral or unwilling stance, the dependent variable – willingness to pay higher environmental taxes – was recoded from five categories into two: 1 = 'willing' and 0 = 'unwilling & neutral'. Specifically, the categories 'very willing' and 'fairly willing' were recoded as 'willing', while 'very unwilling', 'fairly unwilling', and 'neither willing nor unwilling' were recoded as 'unwilling & neutral'. Logistic regression was chosen due to the binary nature of the dependent variable, its flexibility, and its ability to provide quantitative interpretations (Gruszczyński et al., 2012).

All the analyses were performed using Stata18. Because the International Social Survey Programme does not provide overall analysis weight variables, and although individual countries can provide their own weights, it was decided not to use weights in this research in order to eliminate the potential risk of discrepancies arising from varied approaches to weight computation by various countries.

3.2. Data and variables

Dependent variable

The dependent variable, measuring people's *willingness to pay higher environmental taxes*, was measured through the question: *How willing would you be to pay much higher taxes to protect the environment?* Responses were measured on a 5-point Likert scale, where 1 represents 'very unwilling' and 5 'very willing'. As stated in the analysis strategy section 3.1, for the purpose of multivariate analysis, the variable was reclassified into two categories (1 = 'willing' and 0 = 'unwilling & neutral').

Independent variables

Political trust variable was measured through the question: *On a scale of 0 to 10, how much do you personally trust [your country's] parliament?*, where 0 represents 'no trust at all' and 10 represents 'complete trust'.

Social trust was measured through question: *Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?* This was measured on a 5-point scale, where 1 means 'you can't be too careful' and 5 means 'most people can be trusted'.

Environmental attitudes were measured using three variables:

1. *Environmental concern* was measured through the question: *Generally speaking, how concerned are you about environmental issues?*, where 1 means 'not at all concerned' and 5 means 'very concerned';
2. Perception about the impact of environmental problems on everyday life (*effect on everyday life*) was measured through the question: *How much do you agree or disagree that environmental problems have direct effect on everyday life?*, where 1 represents 'disagree strongly' and 5 represents 'agree strongly';
3. The *environmental threat* variable was designed as an average index of four observed variables, measured through the following statements: (1) *In general, do you think that air pollution caused by cars is...*; (2) *In general, do you think that air pollution caused by industry is...*; (3) *Do you think that pollution of the country's rivers, lakes, and streams is...*; (4) *In general, do you think that a rise in the world's temperature caused by climate change is....* Responses were rated on a scale from 1 – 'not dangerous at all for the environment' to 5 – 'extremely dangerous for the environment'.

Four control variables were used in the analysis: age, gender, education and domicile.

Descriptive statistics

The characteristics of the sample are detailed in Table 1. The total sample sizes for each country in the 2020 edition were as follows: France – 1520, Spain – 2254, Norway – 1131, Hungary – 1001, Slovakia – 1013, and Croatia – 1000. The proportion of men and women was balanced across the samples. In all the countries except Croatia, the samples were dominated by people aged 50 and older, with the proportions of people under 35 and those aged 36–49 ranging between 10% and 29%. In Croatia, the youngest group was the most numerous. The proportion of people with primary or no education was marginal in all countries except Spain and France. Individuals with secondary education prevailed in Spain, Hungary, Slovakia, and Croatia, while those with tertiary education were the majority in France and Norway. The place of residence (domicile) was balanced across all countries.

Table 1.
Sample description, ISSP 2020

	France		Spain		Norway		Hungary		Slovakia		Croatia	
	n	%	n	%	n	%	n	%	n	%	n	%
Pay higher environmental taxes												
1 – very unwilling	333	25	565	27	202	18	333	34	517	52	378	38
2	344	26	636	30	237	21	360	37	211	21	275	28
3	350	26	521	25	268	24	158	16	150	15	198	20
4	256	19	339	16	316	29	106	11	99	10	129	13
5 – very willing	46	3	45	2	82	7	16	2	20	2	8	1
Gender												
Male	692	46	1058	47	546	49	398	40	522	52	448	45
Female	828	54	1189	53	577	51	603	60	491	48	552	55
Age												
<=35	146	10	496	22	217	19	211	21	297	29	393	40
36–49	378	25	578	26	228	20	291	29	269	27	276	28
>=50	996	66	1166	52	677	60	499	50	447	44	325	33
Education												
Primary or no education	52	4	375	17	10	1	8	1	0	0	12	1
Secondary	645	46	953	43	381	34	841	84	693	68	747	75
Tertiary	711	50	890	40	725	65	151	15	320	32	231	23
Domicile												
A big city or suburbs of a big city	405	29	734	33	472	42	396	40	171	17	382	38
A town or a small city	501	35	671	30	265	23	323	32	393	39	255	26
A country village	506	36	811	37	391	35	282	28	449	44	362	36
Total	**1520**		**2254**		**1131**		**1001**		**1013**		**1000**	

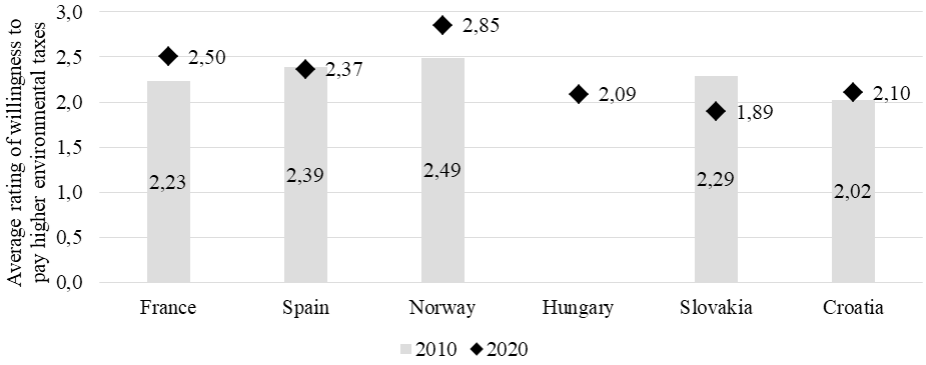
Note: Unweighted data. In case of missing data in categories, the number of observations in the categories may not sum up to the total sample size. Due to the rounding some shares may not add up to 100%.

Source: The author's own analysis based on International Social Survey Programme 2020 – Environment IV (ISSP Research Group, 2023).

4. Results and discussion

Willingness to pay higher environmental taxes between 2010 and 2020 ISSP editions
The analysis commenced with an examination of the average willingness to pay higher environmental taxes across countries in ISSP 2020 compared to 2010. Over the period of analysis, there was a slight increase in the average willingness to pay higher environmental taxes in France, Norway, and Croatia, whereas a decrease was observed in Spain and Slovakia. ISSP 2010 data for Hungary was not available.

Figure 2.
Average willingness to pay higher environmental taxes, ISSP 2010 vs 2020



Note: Unweighted data. Question: How willing would you be to pay much higher taxes to protect the environment? 1 – 'very unwilling' and 5 – 'very willing'.

Source: The author's own analysis based on International Social Survey Programme – Environment III (2010) and IV (2020) (ISSP Research Group, 2019, 2023).

Willingness to pay higher environmental taxes across different groups
Next, the average willingness to pay higher environmental taxes among different respondent groups and countries was examined. The mean ratings and significance levels are detailed in Table 2. Initial observations indicate that respondents from Western and Northern European countries, including Norway (2.85), France (2.50), and Spain (2.37), exhibited a higher willingness to pay increased taxes compared to those from Central and Southern European countries such as Hungary, Slovakia, and Croatia, where average scores ranged from 1.89 to 2.10. These differences between countries were statistically significant at $p < 0.001$.

In the majority of countries except Spain, females demonstrated a higher willingness to pay higher green taxes than males, with statistically significant differences observed in Norway and Slovakia. Respondents with tertiary education exhibited a greater willingness to pay higher taxes compared to those with primary or secondary education. Notably, in most countries except Spain, younger generations generally showed a more positive attitude towards paying higher taxes for environmental reasons than the 50+ age group, though only in Spain and Slovakia were these differences statistically significant. A willingness to pay higher taxes

was lower among rural inhabitants compared to those from urban areas across all countries, although the differences were minimal and statistically significant only in France and Norway.

Table 2.
Average willingness to pay higher environmental taxes, ISSP 2020

	France	Spain	Norway	Hungary	Slovakia	Croatia
Total	2.50	2.37	2.85	2.09	1.89	2.10
Gender						
Male	2.47	2.38	2.79	2.08	1.79	2.05
Female	2.53	2.35	2.92	2.09	2.00	2.15
			****		**	
Age						
<=35	2.60	2.26	2.97	2.05	2.00	2.14
36–49	2.44	2.26	2.87	2.20	1.92	2.11
>=50	2.51	2.47	2.81	2.04	1.81	2.04
		***			****	
Education						
Primary or no education	2.36	2.30	2.10	1.38	-	2.00
Secondary	2.29	2.30	2.44	2.06	1.81	2.08
Tertiary	2.73	2.46	3.09	2.29	2.06	2.17
	***	**	***	**	***	
Domicile						
A big city or suburbs of a big city	2.76	2.41	3.04	2.04	1.86	2.02
A town or a small city	2.44	2.38	2.81	2.14	1.91	2.18
A country village	2.38	2.32	2.68	2.09	1.89	2.14
	***		***			

Note: Unweighted data. Question: How willing would you be to pay much higher taxes to protect the environment? 1 – 'very unwilling' and 5 – 'very willing'. Statistical significance of differences at: *** $p < 0.001$, ** $p < 0.01$, *$p < 0.05$, ****$p < 0.1$ (K–W test).

Source: The author's own analysis based on International Social Survey Programme 2020 – Environment IV (ISSP Research Group, 2023).

Multivariable modeling of the willingness to pay higher environmental taxes
The results of the logistic regression are presented in Table 3. Both political and social trust exhibited a positive and, in most countries, statistically significant effect on the willingness to pay higher environmental taxes. In Hungary, Norway, France, and Spain, social trust had a more pronounced impact than political trust. Specifically, higher trust in most people increased the likelihood of the willingness to pay higher environmental taxes by 42%, 41%, 33%, and 25%, respectively. By contrast,

in Slovakia and Croatia, trust in the national parliament was more crucial than social trust, which was not statistically significant in these countries. Furthermore, the impact of political trust exhibited moderate variation across countries, resulting in odds of being willing to pay higher green taxes that ranged from 11% to 23%.

Beyond trust factors, environmental factors played a significant role. Environmental concern and a perceived environmental threat were particularly important in France, Spain, Norway, and Slovakia. In Croatia, environmental concern and the perceived effect on everyday life were of high importance, while in Hungary, the perceived effect on everyday life was the most influential in this category. For all these variables, the odds of being willing to pay higher environmental taxes ranged from 51% to 119%. The more concerned people were about the environment, and the more they acknowledged that environmental issues like pollution are dangerous and impact their lives, the more willing they were to pay higher green taxes. However, the leading factors varied depending on the country.

Furthermore, tertiary education emerged as a key predictor in Hungary, Norway, France, and Spain, increasing the probability of a willingness to pay higher green taxes compared to those with primary or no education and secondary education by 134%, 103%, 76%, and 64%, respectively.

Among other control variables, age had very little or no effect on the willingness to pay higher green taxes. The place of residence was not a statistically significant predictor in any of the countries. Gender was statistically significant only in Spain, where being female decreased the odds of a willingness to pay higher environmental taxes by 38%.

When examining the explanatory power of the indicators, similar patterns were observed across groups of countries. In France, Spain, and Norway, environmental concern, the perceived environmental threat, and tertiary education (in varying sequences) emerged as the strongest predictors of a willingness to pay higher green taxes, followed by social trust. In Slovakia and Croatia, the three environmental variables were the most significant, except for the perceived environmental threat in Croatia, with political trust having a much smaller influence and social trust having no effect. In Hungary, the willingness to pay higher green taxes was most affected by tertiary education, the perceived impact on everyday life, and social trust.

The variations observed between countries suggest that national and cultural characteristics, including public perceptions of government, society, and environmental matters, play significant roles in shaping opinions on the acceptance of higher green taxes.

5. Discussion and conclusions

Numerous studies indicate that ecology is important to many Europeans. However, recent international crises may have affected attitudes towards environmental initiatives, including the willingness to pay higher green taxes. In light of these findings, and using data from the International Social Survey Programme 2020 – Environment IV, this article investigates the willingness to pay higher environ-

mental taxes among European countries, focusing on non-economic indicators, particularly political and social trust, along with selected environmental attitudes. The primary aim was to identify the most influential predictors and how they vary between countries. This knowledge can help shape better-adjusted and more effective policies. Furthermore, it analyzes the average willingness to pay higher green taxes among various groups and assesses changes in the overall willingness to pay higher taxes for ecological conservation between the 2010 and 2020 ISSP rounds, aiming to identify shifts in attitudes within the countries of interest.

One conclusion of this research is that political trust is an important and statistically significant predictor in all the researched countries, albeit with moderate explanatory power. Fairbrother, using a British sample, demonstrated that even seemingly effective ecological tax initiatives can be undermined by citizens' distrust (Fairbrother, 2019). Similarly, Kollmann and Reichl (2015), using a sample of 32 countries, confirmed that political trust is a crucial factor in the willingness to accept new environmental taxes (Kollmann & Reichl, 2015). The positive effect of political trust was also corroborated by Lim and Moon (Lim & Moon, 2020).

This study also found that, while social trust held greater explanatory power than political trust, it was not statistically significant in all countries, specifically in Croatia and Slovakia. Fairbrother's (2016) study of 32 countries, based on the International Social Survey Programme 2010 and using an ordinal probit model, underscored the importance of both political trust and political satisfaction in fostering environmental support, with varying impacts across nations. His analysis revealed that in countries like France and Norway, social trust had a stronger influence compared to Croatia and Slovakia, while the effect of political trust remained relatively consistent in France, Norway, Spain, Slovakia, and Croatia (Fairbrother, 2016). These findings align with the current research. Davidovic et al. (2020) also found a positive impact of social trust on environmental tax support, demonstrating an even stronger effect of environmental attitudes (Davidovic et al., 2020).

Furthermore, this research indicates that environmental attitudes have a much more significant effect on the willingness to pay higher green taxes compared to political and social trust. However, the strength and importance of these indicators can differ depending on the nation. For instance, while ecological concern was a top priority in France and Norway, it had no statistical significance in Hungary. Conversely, the negative impact of ecological issues on daily life was a crucial predictor in Hungary and Croatia, but was less important in France. Nevertheless, on a broader scale, environmental attitudes play a crucial role in explaining the willingness to pay extra for protecting the environment. The appropriate indicators must be applied when designing policies and initiatives for particular nations. Environmentalism and environmental concern have also been identified by other authors as significant predictors of support for environmental protection (Fairbrother, 2016; Kollmann et al., 2012).

Additionally, it was demonstrated that education, particularly tertiary education, possessed substantial explanatory power of willingness to pay higher green taxes in all countries where statistical significance was confirmed, such as France, Spain, Norway, and Hungary. The importance of education has been consistently validated

by numerous authors (Davidovic et al., 2020; Franzen & Meyer, 2010; Kollmann et al., 2012; Lim & Moon, 2020; Neumayer, 2004). Furthermore, variables such as domicile, age, or gender showed little to no effect on the willingness to pay more.

In analyzing the willingness to pay higher green taxes, notable similarities were observed among the countries studied. Based on the 2020 ISSP data, the average willingness to pay higher environmental taxes was greater in France, Norway, and Spain compared to Slovakia, Croatia, and Hungary. In France, Norway, and Spain, the most critical factors were environmental concern, perceived environmental threat, and tertiary education, followed by social trust. Notably, France and Norway also showed an increase in the average willingness to pay higher green taxes over time. In Slovakia and Croatia, environmental variables were the most critical predictors, while political trust had a much smaller influence, with social trust and most demographic variables showing no statistical significance. However, these two countries slightly diverged in their trends during the period under analysis: Croatia experienced an increase in the willingness to pay higher green taxes, while Slovakia saw a decrease. Hungary followed a distinct pattern, where tertiary education, the perceived negative impact of environmental issues on daily life (with other environmental attitudes not statistically significant), along with social trust, were the most influential factors. Furthermore, the model fit for Hungary was lower than that for the other countries, implying that enhancing the model with additional variables could yield a deeper understanding of the matter in Hungary.

Several points of reflection can be proposed from the results. First, while not all variables are within governmental control, trust in political authorities can be enhanced by improving the quality of governance (Christensen & Lægreid, 2005; Van Ryzin, 2007). Additionally, despite abundant evidence of global change, the gradual increase in atmospheric CO2 levels is not readily observable. This invisibility makes comprehension challenging, thereby underscoring the necessity for dedicated efforts in environmental communication, education, and societal involvement. Such efforts are crucial to elicit a stronger collective response and heightened awareness (Bentley & O'Brien, 2015). Kollmann and colleagues highlight the asymmetry in environmental information across Europe. Strengthening informational and educational initiatives could positively impact the willingness to support ecological initiatives (Kollmann et al., 2012).

Several potential directions for future research can be identified based on the presented findings. First, conducting a country-focused study on the most effective combination of ecological initiatives aligned with key predictors of willingness to pay higher taxes would be valuable in designing more effective national policies. As demonstrated, varied but targeted strategies may be necessary across different contexts. Additionally, investigating how the explanatory power of the analyzed predictors behaves during more economically stable periods, especially in comparison to times of economic pressure (e.g., energy crises), would deepen our understanding of the results presented in this study. Furthermore, the observed similarities and differences in the explanatory strength and significance of the tested variables across countries underscore the importance of conducting a measurement invariance analysis. Such an analysis would clarify whether the concept of the willing-

ness to pay higher green taxes is consistently understood across nations, ultimately facilitating more robust comparisons and interpretations of international studies.

In conclusion, it is essential to recognize that the willingness to pay higher taxes for environmental protection is a complex and somewhat ambiguous concept. Consequently, the data presented in this article do not support straightforward causal conclusions. Additionally, it is important to note that the study was conducted without applying sample weights, which means the results may not fully represent the characteristics of the researched nations. Furthermore, research fieldwork took place at various time points between 2019 and 2023, varying by country, which could potentially influence the results.

Despite these limitations, this work provides valuable insights into the significance of researched indicators within the context of supporting ecological taxation policies across six European countries. The findings of this study can assist policymakers in proactively designing policies that accommodate differences and similarities between countries, focusing on the aspects that work best for each.

Table 3.
Willingness to pay higher environmental taxes, logistic regression, ISSP 2020

	France		Spain		Norway		Slovakia		Hungary		Croatia	
	Coef.	OR	Coef.	OR	Coef.	OR	Coef.	OR	Coef.	OR	Coef.	OR
Trust												
Social trust: trust in most people *(5=most people can be trusted)*	.29	1.33***	.22	1.25***	.34	1.41***	.12	1.12	.35	1.42***	-.01	.99
Political trust: trust in parliament *(10=complete trust)*	.12	1.13**	.13	1.14***	.21	1.23***	.10	1.11*	.12	1.12**	.18	1.20***
Environment												
Environmental concern *(5=very concerned)*	.65	1.92***	.45	1.57***	.64	1.90***	.46	1.59***	-.10	.90	.57	1.76***
Effect on everyday life *(5=agree strongly)*	.15	1.17****	.21	1.24**	.21	1.24*	.27	1.31*	.41	1.51***	.55	1.74***
Environmental thread *(5=extremely dangerous for the environment)*	.54	1.72***	.61	1.84***	.65	1.92***	.78	2.19***	.09	1.1	.23	1.26
Demography												
Age	.00	1.00	.01	1.01*	.00	1.00	-.01	.99*	.00	1.00	-.01	.99
Gender *(0=male)*	-.24	.78	-.48	.62***	-.04	.96	-.24	.78	-.19	.83	.09	1.09
Education (0=primary or no education & secondary)												
Tertiary	.56	1.76**	.49	1.64***	.71	2.03***	.00	.97	.00	2.34**	.09	1.10
Domicile *(0=a country village)*												
A big city or suburbs of a big city	.25	1.29	.15	1.16	.09	1.10	.21	1.24	.08	1.09	-.18	.83
A town or a small city	.12	1.12	.21	1.24	-.02	.98	.29	1.33	-.25	.78	.31	1.36
const	-8.33		-8.07		-9.18		-7.46		-4.49		-7.08	
Pseudo R-square: Nagelkerke	.245		.193		.359		.182		.096		.194	
n	1172		1826		1001		943		937		954	

Note: Unweighted data. Dependent variable: How willing would you be to pay much higher taxes to protect the environment? 1-'willing' and 0-'unwilling & neutral'. OR – odds ratio. Statistical significance at: *** p < 0.001, ** p < 0.01, *p < 0.05, ****p < 0.1.

Source: The author's own analysis based on International Social Survey 2020 – Environment IV (ISSP Research Group, 2023).

6. Data availability

Data used in this study is publicly available:

- ISSP Research Group. (2023). *International Social Survey Programme. Environment IV – ISSP 2020* (A7650 Data file Version 2.0.0). GESIS. https://doi.org/10.4232/1.14153
- ISSP Research Group. (2019). *International Social Survey Programme: Environment III – ISSP 2010* (ZA5500 Data file Version 3.0.0). GESIS. https://doi.org/10.4232/1.13271

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