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Environmental protection or economic growth? The effects of preferences for individual freedoms

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Environmental protection is often seen in conflict with individual freedom and economic growth. The proponents of environmental protection suggest that the environment is a global resource that must be protected for future generations, even at the expense of economic growth and individual freedoms. The opponents claim that environmental protection should not come at the expense of individual rights and liberties, economic growth included. This paper studies the associations between public preferences for environmental protection, economic growth, and individual freedoms in eleven post-soviet countries on a representative dataset (N = 20006, age 18+, M ± SD: 46,04 ± 17,07; 58% women, 46,8% upper education). Methodologically we rely on correlations, principal component analysis, and ordinal regression analyses. The results suggest that preferences for most personal freedoms studied predict environmental protection and economic growth preferences. In addition, preferences for civil rights, rights for democracy, gender equality, income inequality, and the low role of the army in politics predicted higher preferences for environmental protection and economic growth. Interestingly, the government's right to video surveillance in public areas, though diminishing personal freedoms in terms of anonymity, predicted higher preferences for environmental protection and economic growth. The importance of God in lives proved to increase preferences for environmental protection but was negatively related to preferences for economic growth. We suggest the government communicate the need for environmental protection as a part of the rights for individual freedom to live in a clean environment.

KEYWORDS

environment protection, economic growth, preferences, survey, environmental kuznets curve, post-soviet countries

1 Introduction

Increasing environmental degradation has received considerable attention from policymakers and academic communities (Sinha et al., 2020; Cheng et al., 2021). Governments spelled out mitigation strategies for addressing the challenges of climate change in Intended Nationally Determined Contributions (INDCs) adopted in the Paris Agreement. The European Union and national governments have set clear objectives of where to be by 2050, under the EU priorities and Green Deal policies and with the support of

dedicated research programs, legislation, and funding. Numerous environmental regulations around the globe abound.

The literature indicates that the relationship between economic growth and environmental quality is U-shaped (Environmental Kuznets Curve, EKC). While economic performance in poorer countries leads to a decrease in environmental quality, the association is reversed in richer countries (Shahbaz et al., 2013; Stern, 2017; Anwar et al., 2022). Research shows that Post Soviet Union countries have not yet achieved the turning point (Yang et al., 2017; Hasanov et al., 2019; Hasanov et al., 2023), meaning the tradeoff between economic growth and environmental quality is very apparent and calls for the implementation of environmental regulations.

Environmental regulations may reduce immediate economic performance by imposing additional costs and risks (Nikolaou et al., 2014; Demertzidis et al., 2015; Hashmi and Alam, 2019). Environmental regulations also motivate firms to adopt new technologies, which may increase economic growth in the long run (Sarkodie et al., 2019; Fan and Hao, 2020; Dechezleprêtre, et al., 2022). Less developed countries are shown to be less willing to invest in long-term environmental protection at the expense of immediate satisfaction of their material needs (the poverty-induced environmental degradation, Masron and Subramaniam, 2019; Moseley, 2001). In fact, poverty is shown among the principal sources of environmental damage across the countries (Masron and Subramaniam, 2019). Thus, the tradeoff between economic performance and environmental protection is essential, especially in less abundant countries (Sarkodie and Strezov, 2019; Güngör et al., 2021; Al-Mulali et al., 2022).

Besides economic performance, environmental regulations inevitably affect individual freedoms, including the freedoms of democracy and the corresponding role of the government. Economic and political freedoms indicate systemic differences across countries and are shown to significantly affect environmental degradation, as well as the preferences and costs of environmental protection (Zhang et al., 2019; Bruun, 2020; Halvorson, 2021; Anwar et al., 2022). However, preferences for political and economic freedoms are rarely considered in predicting preferences for environmental protection (Joshi and Beck, 2018).

This paper aims to study the role of the preferences for individual freedoms and the role of the government in predicting preferences for environmental protection and economic growth in Post-Soviet countries. Since many of the Post-Soviet countries are highly religious, we also hypothesize that religiosity contributes to the preferences for environmental protection (similar to Eom, et al., 2021a). The following hypotheses are tested:

- H1. Preferences for individual freedoms predict preference for environmental protection.
- H2. The preferred role of the government predicts preferences for environmental protection.
- H3. Religiosity affects the preference for environmental protection.

We rely on a representative survey-based dataset from eleven Post-Soviet countries (N = 20006, age 18+, M ± SD: 46,04 ± 17,07; 58% women, 46,8% upper education). As economic performance is of immense importance in less-affluent post-soviet countries, we also test a similar set of hypotheses to predict the preferences for economic growth as one of the country's priorities. This enabled us to contrast factors predicting environmental protection to factors predicting preference for economic growth at the expense of other social goals, such as military spending or making the cities and countryside more beautiful. Methodologically we rely on exploratory principal component analysis to study the structure of the preferences for individual freedoms and logistic regression analyses to test the hypotheses.

The paper is structured as follows. The first section discusses the theoretical debate on the association between the freedom and environment protection. (false) dilemma between economic growth and environmental protection and briefly summarizes the literature on environmental regulations, the role of the government and individual freedom. The next sections describe data and models. The following sections present and discuss the results. The last sections conclude.

2 Freedom and environment protection. The theoretical debate

Freedom and environmental sustainability are two concepts that are closely linked (Hannis, 2015). Sustainable development is defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations Brundtland Commission, 1987). To achieve this, it is essential that all members of society are able to make decisions freely and have access to resources so that they can make informed choices (Boyle, 2007).

Environmental protection often conflicts with individual freedom (Boyle, 2007; Shelton, 2012) though both are often seen as parts of human rights (Osofsky, 2005). On one side of the debate, people argue that environmental protection must take precedence over individual freedom. Conversely, some argue that individual freedom should not be sacrificed in the name of environmental protection (Boyle, 2007; Shelton, 2012). Those who argue in favor of prioritizing environmental protection over individual freedom say that the environment is a global resource that must be protected for future generations. They argue that individual freedom must be sacrificed to ensure that the environment is preserved and the global climate crisis is addressed. On the other hand, those who emphasize the importance of individual freedom argue that environmental protection should not come at the expense of individual rights and liberties. They argue that environmental regulations must be implemented in a way that does not overly restrict individual freedom (Boyle, 2007; Shelton, 2012).

The debate over environmental protection and individual freedom is complex and difficult to resolve. It is important to recognize that both sides of the argument have valid points and that there is no easy answer. It is also important to recognize that the two sides of the debate are not mutually exclusive and that a compromise can be reached those respects both sides of the argument. For example, it is possible to implement environmental regulations in a way that does not overly restrict

TABLE 1 The effect of environmental regulations on economic performance—two opposing views.

Environmental regulations decrease economic performance	Environment protection measures do not decrease economic performance
A 1% increase in environmental tax revenue *per capita* reduces carbon emissions by 0.03% for OECD countries Hashmi and Alam (2019).	The adoption of environmentally adapted technologies is not opposed to economic growth Cordero et al. (2005)
Environmental regulations increase adaptation and compliance costs which negatively influence competitive advantage Nikolaou et al. (2021); Trevlopoulos et al. (2021)	Renewable energy consumption and economic growth are financial development driven in the long run, and there is bidirectional causality between renewable energy consumption Eren et al. (2019)
Severe environmental regulations have a negative impact on the creation of new firms Dean et al. (2000)	In the short term, foreign direct investment cannot significantly cause renewable energy consumption change; but in the long run, a modest slowdown in gross domestic product growth and targeted foreign direct investment will generate a significant boost in renewable energy in China Fan and Hao (2020).
Stricter regulations incur high firms' expenditures for pollution abatement Becker (2005).	Economic development declines energy intensity and improves energy efficiency Sarkodie et al. (2019)
The impact of regulations on firms' operations is differentiated between large and small firms. Large firms seem to have an advantage in relation to the small firms, though both firms are damaged Heyes (2009)	Environmental regulations reduce operational costs and create intellectual capital Nikolaou et al. (2021); Trevlopoulos et al. (2021)
The environmental regulatory risks reduce willingness to invest in firms to avoid additional costs from fees or penalties Demertzidis et al. (2015); Nikolaou et al. (2014)	Environmental regulations could help firms create competitive advantages and new innovations Porter and Van der Linde (2000)
In the short run, environmental regulations negatively influence innovation, and innovation negatively influences economic performance in industrial sectors Ramanathan et al. (2010)	Directive 53/2000EC (EC 2000) forced automotive industries to integrate eco-design and circular economy principles (e.g., disassembly, reuse, and recycling practices Smith and Crotty (2008).
Tighter environmentally based water regulation lowers profitability by increasing costs conditioned on a given level of sales Rassier and Earnhart (2010).	Environmental regulations affect firms' innovations Rennings and Rammer (2011).
Environmental regulation's have strong significant negative effect on productivity Gray and Shadbegian (2003).	The European Union Emissions Trading System had no significant impact on profits and employment and increased regulated firms' revenues and fixed assets Dechezleprêtre et al. (2022).
Environment regulations cause a decline in productivity in every sector following more stringent abatement requirements [10%–50%, Barbera and McConnell (1990)].	On the firm level, better environmental performance can increase revenues via better access to particular markets, differentiating products, and selling pollution-control technology Ambec and Lanoie (2008).
There is a negative correlation between profits and environmental regulations Filbeck and Gorman (2004).	Better environmental performance can reduce costs via better risk management and relations with stakeholders, lower cost of material energy and services, and lower cost of capital and labor Ambec and Lanoie (2008).

individual freedom while still achieving the goal of protecting the environment (Klöpfer, 1996).

2.1 Economic growth or environmental protection? the (false) dilemma?

The role of environmental sustainability in limiting economic growth was first discussed in the aftermath of the Limits to Growth report (Meadows, et al., 1972; Hannis, 2015). Leading economists widely recognized the depletion of non-renewable resources as a factor constraining long-term economic growth (Solow, 1974; Stiglitz, 1974; Hartwick, 1978). The theories of sustainable development then emphasized limiting economic growth for the sake of environmental protection.

Environmental protection helps with many critical societal goals, such as long-term sustainability, a cleaner environment, reduction in climate change, and healthier food. However, it also requires additional resources and brings risks and limitations. It also creates new industries and promotes new technologies, which in the long run may increase economic performance (Panayotou, 2016; Nikolaou, et al., 2021). On the firm level, better environmental performance can increase revenues via better access to particular markets, differentiating products, and selling pollution-control technology (Ambec and Lanoie, 2008). Moreover, better environmental regulation increases resource use efficiency and, under some conditions, can increase economic performance (Porter hypothesis, Porter and Van der Linde, 1995; Brännlund and Lundgren, 2009). In addition, some factors, such as renewable energy, can positively impact both environmental protection and economic growth (Hasanov et al., 2021); The total effect of environmental regulations on economic performance is unclear. The following Table 1 illustrates the two opposing views of literature on the topic.

Ideally, environmental regulations should correspond to environmental quality. The relationships between economic growth and environmental quality may change the sign when the country reaches a certain level of economic performance as people can afford more efficient and environment-friendly production resulting in a cleaner environment as suggested by Environmental Kuznets Curve (EKC, Shahbaz et al., 2013; Stern, 2017; Anwar et al., 2022). Yet, environmental protection is a global issue, and especially the developed countries are introducing new measures to improve the environment.

3 The factors affecting the preferences for environmental protection. Literature review

The impetus for environmental protection was originally verbalized in the 1970s in the United States in Fisk's Theory of Responsible Consumption (Fisk,1974), Henion and Kinnear's Ecological Marketing (1976), and Kardash's Ecologically Concerned Consumer (Kardash, 1974). Studies initially focused on energy use, pollution connected to the automobile, oil, and chemical industries, as well as consumer reactions to advertising and labeling (Henion and Kinnear, 1976; Kilbourne and Beckmann, 1998; Peattie, 2010). Subsequently, they turned to examine green purchases of food products and environmentally friendly items.

Research into the preferences for environmental protection has focused on identifying impacting factors to promote environmental protection. These factors have largely reflected the prevailing social and economic paradigms of the time. Early literature concentrated on economic incentives and financial capabilities of households, socio-demographic characteristics (Laroche, et al., 2001; Robinson and Smith, 2002; Jenkins, et al., 2003), and environmental knowledge (Peattie, 2010) and advised that government policy should primarily provide economic incentives to support pro-environmental behavior (Bartelings and Sterner, 1999; Eriksson, 2004; Jackson, 2005; Wang et al., 2021; Shen and Wang, 2022). This approach is still in use today in waste management, where households are incentivized to sort communal waste by making the disposal of sorted waste free of charge. The socio-demographic factors as potential predictors of preferences for environmental protection are often used as control variables in more recent studies (Walia et al., 2020). The studies based on economic data suggested that more affluent households have a greater environmental footprint yet can afford to buy "greener" products (Cymru, 2002; Lenzen and Murray, 2003; Huang et al., 2022). Therefore, a rise in income may lead to an increase in pro-environmental consumption.

After focusing on economic, demographic, or knowledge factors, the research has shifted its focus to attitudes and values, which were recognized to be often more important in predicting environmental protection than economic or socio-demographic. For example, Schwartz's value model and altruistic values have been reported to be linked to pro-environmental behavior (Han et al., 2007; Carrus et al., 2008; Peattie, 2010; Wang L. et al., 2019; Wang Y. et al., 2019). Surprisingly, not all pro-environmental values lead to greater environmental protection. For example, pro-environmental values may not always lead to an increase in such activities as recycling (Barr, 2007), buying organic food, or avoiding leaving appliances on standby (Lyndhurst, 2004). Research has also indicated that environmental attitudes, environmental knowledge, subjective norms, perceived behavioral control, conditional value, and emotional value all positively affect pro-environmental intentions and behaviors (Nekmahmud et al., 2022).

3.1 Government regulations, freedom, and environmental protection

Governmental regulations are frequently called upon to ensure environmental protection (Sarkodie and Strezov, 2019; Güngör et al., 2021; Al-Mulali et al., 2022). However, restrictive governmental regulations "circumscribes the autonomy (freedom) of the members of society" (Porket, 2003, p. 50). The post-soviet countries present a wide variety of attitudes to personal freedoms ranging from more Westernized democratic Baltic countries admitted to European Union to a collection of autocracies without any extensive, market-based liberalization in Central Asia (Hartwell, 2022).

Economic and political freedoms have been shown to affect the environment significantly regarding the preferences for and costs of environmental protection (Zhang et al., 2019; Bruun, 2020; Halvorson, 2021; Anwar et al., 2022). Yet, the preferences for political and economic freedoms are rarely considered for predicting the environmental preferences of the population (Joshi and Beck, 2018). In this paper, we hypothesize that the preferences for individual freedoms are significant predictors of the preferences for environmental protection (H1).

Environment protection requires regulation of personal behavior, which can be monitored via all kinds of surveillance means, including street cameras, monitoring of emails, and collecting and storing personal information. These means can increase the efficiency of environmental regulations but decrease individual freedoms. In this paper, we hypothesize that the preferences for government-managed video surveillance, monitoring of emails, and collecting information about everyone predict preferences for environmental protection (H2).

Personal freedoms are often exchanged for (the illusion of) protection from the government (Hofstede, et al., 2005). We test whether the preference on the amount of government responsibility (government taxing the rich and subsidizing the poor, making the incomes equal, government owning the businesses, government paying unemployment benefits, people obeying their rulers) predicts preferences for environmental protection.

Personal freedom is also reflected in the procedure of election. We hypothesize that the preferred role of the government and the way it is elected are significant predictors of the preferences for environmental protection (H2). We employ the following indicators to account for the election procedure: people choose their leaders in free elections, the importance of democracy, personal freedoms as a sign of democracy, women have the same rights as men, and the army takes over when the government is incompetent (disagreement with).

3.2 The role of religion

The post-soviet region is largely diversified in religious confessions and the role assigned to God. The scale ranges from relatively secular Baltic countries (Estonia, Latvia, Lithuania), through multi-religious Russia, to essentially 90% religious Islamic (mostly) Central Asia (Simons and Westerlund, 2016). After the fall of the Soviet Union, religious confessions gained more power in defining, interfering and affecting the ideas of personal freedom and the environment (Froese, 2004).

Religion has a strong influence on people's preferences to protect the environment. Many religious teachings incorporate conservation and stewardship of the environment, providing an ethical and moral incentive to protect the environment (Djupe and Hunt, 2009; Jenkins and Chapple, 2011). Religious beliefs can also

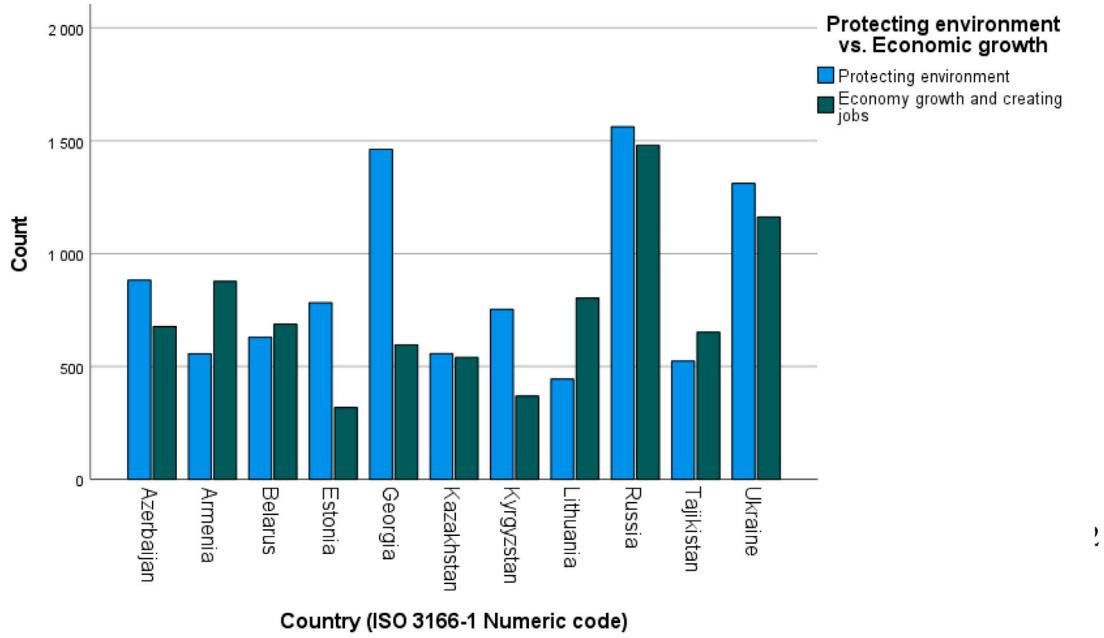

FIGURE 1
Protecting the environment vs. economic growth. The distribution of the respondents. Source: own computations based on the data EVS/WVS (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021).

shape people's attitudes toward the environment in terms of the value they place on nature, the importance of maintaining a balance between humanity and nature, and the need to be good stewards of the Earth (Jenkins and Chapple, 2011; Hope, and Jones, 2014; Bergmann, 2017). This can lead to an increased commitment to environmental protection and conservation, as well as greater environmental concern and activism (Sherkat and Ellison, 2007). Thus, in the line of Eom, et al. (2021b), we suggest that religiosity is a significant predictor for the preferences for environmental protection in post-soviet countries (H3). We employ two indicators for religious beliefs: the subjective importance of God in life and the level of agreement with the religious authorities interpreting the laws.

4 Materials and methods

4.1 The study

This paper aims to study the impact of preferences for economic (and other) freedoms and the expected role of the government on preferences for environmental protection in the eleven Post Soviet Union countries (Azerbaijan, Armenia, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Russia, Tajikistan, Ukraine). Religiosity is suggested to be the next factor to consider. The following hypotheses are tested:

H1. Preferences for individual freedoms predict preference for environmental protection.

The indicators of the preferences for individual freedoms include the preferred right of the government to:

- Keep people under video surveillance in public areas.
- Monitor all emails and any other information exchanged on the internet.
- Collect information about anyone living in the country without their knowledge.

H2. The preferred role of the government predicts preferences for environmental protection. The Indicators for the role of the government include:

- Governments tax the rich and subsidize the poor.
- Religious authorities interpret the laws.
- People choose their leaders in free elections.
- People receive state aid for unemployment.
- The army takes over when the government is incompetent.
- Civil rights protect people's liberty against oppression.
- Women have the same rights as men.
- The state makes people's incomes equal
- People obey their rulers

H3. Religiosity affects the preference for environmental protection.

The indicators for religiosity include.

- Importance of God in life
- Religious authorities should interpret the laws

As economic performance is of immense importance in Post-Soviet countries, we also test similar hypotheses to predict the preferences for economic growth as one of the country's

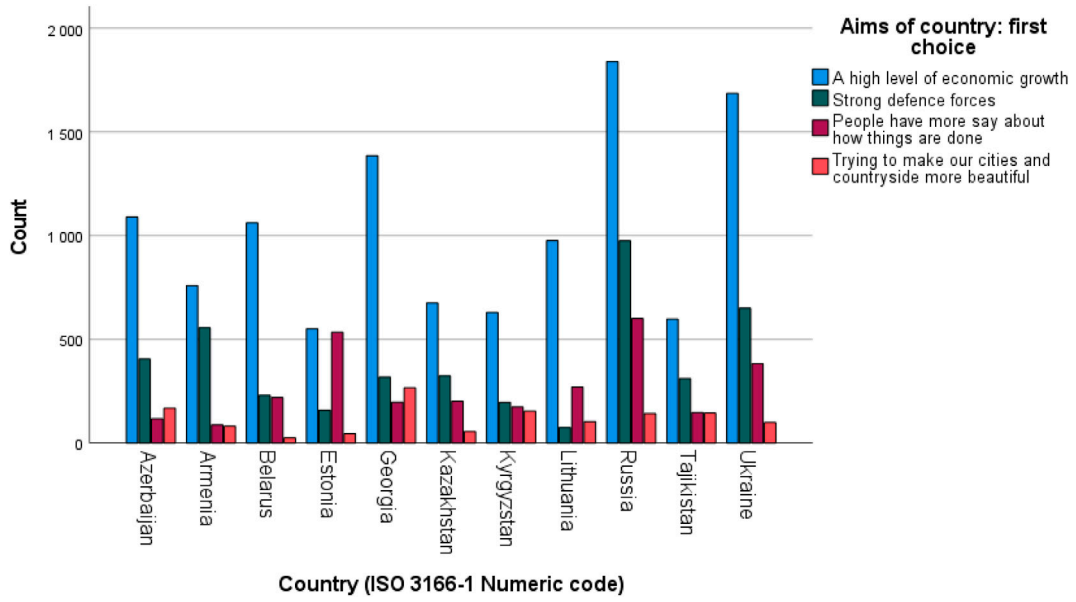

FIGURE 2
Aims of the country, first choice. The distribution of the respondents. Source: own computations.

priorities. This will enable us to contrast the importance and effects of environmental protection to the other social goals.

4.2 The data

We employ a representative dataset collected in the World Value Study and European Value Study in 11 post-Soviet Union countries in 2017–2020 (Joint dataset, EVS/WVS, 2021; see also EVS, 2020a; EVS, 2021; Haerpfer et al., 2021). The choice of countries was based on data availability. All the Post-Soviet Union countries present in the EVS/WVS dataset were incorporated into the analysis. The target population was defined as persons aged 18 and older who had been residing in the country within private households for the past 6 months before the fieldwork (EVS, 2020b; WVS, 2020). The sampling relied on a representative single-stage or multi-stage probability sampling of the country's adult population, 18 years old and older. The sample size was set as an effective sample size: with N minimum of 1,500 for countries over 100 million, 1,200 for countries with a population over 2 million, and 1,000 for countries below 2 million. A resulting total sample embraced 20006 respondents aged 18+ (mean age ± SD: 46,04 ± 17,07, 58% women, 46,8% upper education (Upper level: ISCED 2011 levels 5–8—short cycle tertiary and higher). Most surveys were conducted using face-to-face interviews (WVS, 2020; EVS, 2020b) The data are available for non-commercial purposes at the web pages of European and World Value Studies (https://europeanvaluesstudy.eu/methodology-data-documentation/survey-2017/joint-evs-wvs-2017-2021-dataset/, accessed 11. 11.21).

4.3 Indicators

The following section provides the exact wording of the questions employed in the further analysis and the distribution of the respondents.

4.3.1 Preference for environmental protection at the expense of economic growth

4.3.1.1 Protecting environment vs. economic growth

"Here are two statements people sometimes make when discussing the environment and economic growth. Which of them comes closer to your own point of view?

- Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs." (53,70% of the respondents),"
- Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent. (46,30% of the respondents)" (EVS, 2020a; 2021; Haerpfer et al., 2021).

The distributions of the respondents in studied countries are presented in Figure 1 below (end of the paper) and Supplementary Table SA3.

4.3.1.2 Economic growth as one of the country's priorities

- "A high level of economic growth" (57,20% of the respondents)
- "Making sure this country has strong defense forces" (21,40% of the respondents)
- "Seeing that people have more say about how things are done at their jobs and in their communities (14,90 of the respondents)"

- "Trying to make our cities and countryside more beautiful (6,50% of the respondents)", (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021)

> "People sometimes talk about what the aims of this country should be for the next ten years. On this card are listed some of the goals that different people would give top priority. Would you please say which one of these you, consider the most important?"

Figure 2 below and Supplementary Table SA4 present the distributions of the respondents in countries.

4.3.1.3 Personal freedom versus the role of the government

This study considers the capability of the government to control individual lives via video surveillance, monitoring the information exchanged on the internet, and collecting information about individuals without their knowledge. The corresponding question in the questionnaire was formulated as follows:

- Keep people under video surveillance in public areas
- Monitor all emails and any other information exchanged on the internet
- Collect information about anyone living in [COUNTRY] without their knowledge

1 - Definitely should have the right; 2—Probably should have the right; 3—Probably should not have the right; 4—Definitely should not have the right" (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021)

> *"Do you think that the [COUNTRY] government should or should not have the right to do the following:*

We suggest that all three questions are related to preferences for environmental protection. For example, monitoring people in public areas might be used as a tool to localize and personalize the origins of garbage lest on unauthorized places. The monitoring of the emails and collecting information may provide information on intentions to comply with government regulations to protect the environment.

Personal freedom goes hand in hand with personal responsibility. The corresponding questions in the questionnaire were formulated as follows:

- People should take more responsibility; 10- The government should take more responsibility
- Private ownership of business should be increased; 10- Government ownership of business should be increased" (EVS, 2020a; 2021; Haerpfer et al., 2021)

> "On this card you see a number of opposite views on various issues. How would you place your views on this scale?

The distribution of the respondents is presented in Supplementary Table SA5.

4.3.1.4 Personal freedoms and rights as essential signs of democracy

- Governments tax the rich and subsidize the poor.
- Religious authorities interpret the laws.
- People choose their leaders in free elections.
- People receive state aid for unemployment.
- The army takes over when the government is incompetent.
- Civil rights protect people's liberty against oppression.
- Women have the same rights as men.
- The state makes people's incomes equal
- People obey their rulers" (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021)

> "Many things are desirable, but not all of them are essential characteristics of democracy. Please tell me for each of the following things how essential you think it is as a characteristic of democracy. Use this scale where 1 means "not at all an essential characteristic of democracy" and 10 means it definitely is "an essential characteristic of democracy."

The distributions of the respondents are presented in Supplementary Table SA6.

4.3.1.5 The level and importance of democracy

"How important is it for you to live in a country that is governed democratically? On this scale where 1 means it is "not at all important" and 10 means "absolutely important," what position would you choose?" (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021)

> *"And how democratically is this country being governed today? Again using a scale from 1 to 10, where 1 means that it is "not at all democratic" and 10 means that it is "completely democratic," what position would you choose?"* (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021)

The distributions of respondents are presented in Supplementary Table SA7.

4.3.1.6 The attitude to competition and work

Environmental restrictions highly affect the competitiveness of the firms and the availability of jobs (Iraldo, et al., 2011; Dechezleprêtre and Sato, 2017; Borsatto and Amui, 2019). We control for the attitude to competition (good-harmful) and the importance of work and equal pay. The answers to the following questions are used as indicators.

- Competition is good, 10—competition is harmful
- Incomes should be made more equal, 10—We need larger income differences as incentives" (EVS, 2020a; 2021; Haerpfer et al., 2021)

- *Work. 1—Very important; 2—Rather important; 3—Not very important; 4—Not at all important."* (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021)

> *"On this card, you see a number of opposite views on various issues. How would you place your views on this scale?*

> "Please say, for each of the following, how important it is in your life.

The distribution of the respondents is presented in Supplementary Table SA8.

4.3.1.7 Importance of God and socio-demographic characteristics

Following Eom, et al. (2021b), we study the effect of religiosity on preference for environmental protection at the expense of economic growth. The question was formulated as follows:

- Please use this card to indicate—10 means very important and 1 means not at all important." (EVS, 2020a; EVS, 2021; Haerpfer et al., 2021)

> "And how important is God in your life?

The resulting variable presented mean of 7,57 and Std. Deviation of 3,175. A total sample embraced 20006 respondents aged 18+ (mean age ± SD: 46,04 ± 17,07, 58% women, 46,8% upper education, the distribution of the respondents split by countries see Supplementary Table SA2).

4.4 The method

First, we conducted an exploratory Principal Component Analysis to study the perceptions of individual freedoms as signs of democracy. Then we rely on ordinal regression analysis to test the hypotheses (Formula 1, the numbers like $a_{1\text{-}13}$ denote thirteen coefficients corresponding to thirteen indicators of preferences for freedom versus government, see the description of the variables beneath the equation)

$$\begin{aligned} Environment\ vs.\ Growth_i = logit\,(a_0 & \\ + a_{1-13} Freedom\ verus\ Government & \\ + a_{14-16} Competition\ and\ work & \\ + a_{17-18} Religiosity + a_{19-29} Country & \\ + a_{30} Age + a_{31} Gender & \\ + a_{32} Education + e & \end{aligned} \tag{1}$$

Where.

Environment vs. Growth$_i$

- two indicators of preferences for environment vs. economic growth and economic growth as a country priority subsequently.

Freedom versus government

- Government should have the right to monitor people via internet, in public areas and collect information without their knowledge.
- Government should tax the rich and subsidize the poor.
- People have the freedom of election.
- People have the right to state aid for unemployment.
- In case of an incompetent government, the army takes over
- Civil rights protect people's liberty
- Gender equality of rights and freedoms
- More income equality
- People need to obey their rulers
- People should take more responsibility, not the government
- Private or government business ownership is preferable
- Democracy is important
- The country is democratic

Competition and work

- Competition is good/harmful
- Incomes should be more/less equal
- Importance of work

Religiosity

- Religious authorities interpret the laws.
- The importance of God in life

Country

- country dummies for Azerbaijan, Armenia, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Russia, Tajikistan, Ukraine

Socio-demographic characteristics

- Age
- Gender
- Education

The two models corresponding to two dependent variables were estimated via ordinal logit regression (Formula 1). The Pearson correlations of independent variables are presented in Supplementary Table SA1. None of the correlations exceeded 0,5; thus, multicollinearity is unlikely.

5 Results

5.1 Individual freedoms as characteristics of democracy. The results of the Principal Component Analysis

Before discussing the results of the Principal Component Analysis, we present the setting of the analysis and the indicators measuring the suitability of the data for this type of the analysis. The Principal Component Analysis was set as follows: rotation Method - Varimax with Kaiser normalization; the number of components - according to Eigenvalue (>1). Rotation converged in 3 iterations. The Bartlett test of sphericity with a Chi-Square value 106609,60 ($p < 0{,}001$) and Kaiser-Meyer-Olkin Measure of sampling adequacy with a value equal to 0,790 (>0,6) suggests that the data are suitable to identify factor dimensions. The indicators of applicability of the Principal component analysis, as presented above, suggest that the method is suitable for the data.

The results of the Principal Component Analysis are presented in Tables 2, 3. Four extracted components altogether were able to explain 51,29% of the variance.

As the results suggest, the indicators for freedom (as a sign of democracy) divided themselves into two categories described by two latent variables (Table 3). The first views democracy as a system representing civil rights and freedoms, implying free elections,

TABLE 2 Principal component analysis for individual freedoms as signs of democracy. Total variance explained.

Component	Initial eigenvalues			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,929	32,541	32,541	2,484	27,596	27,596
2	1,688	18,75	51,291	2,133	23,695	51,291

Extraction Method: Principal Component Analysis.

gender equality, liberty, and the right to receive state aid if unemployed. The other group of variables describes democracy in terms of the increased role of the state, army, and religion, implying the state provides more income equality. If the state is incompetent, the army takes over, religious authorities interpret the laws, and the population is obedient to their rulers. The first latent variable constitutes the freedom apex, while the second constitutes the opposite.

Personal freedoms as predictors of preference for environmental protection and economic growth. The results of logistic regression analyses.

The results of logistic regression analyses (Formula 1) are presented in Table 4.

The summary of the statistically significant results from Table 4 is presented in Table 5. The positive associations are denoted by "+", the negative ones, by "-".

6 Discussion

6.1 Hypotheses 1 and 2: Preferences for individual freedoms and the role of the government predict preferences for environmental protection.

This paper studied the association between the preferences for individual freedom, the role of the government, and preferences for environmental protection. The results of the analysis above indicate that associations between environmental protection, economic growth, and individual freedoms are far from uniform. On one side, personal freedoms (civil rights, the importance of democracy, gender equality, pay inequality if it occurs, no role of the army in politics) predicted higher preferences for environment protection at the expense of economic growth and higher growth itself as opposed to other societal goals. This indicates personal freedoms are positively related to environmental protection. On the other side, governmental video surveillance in public areas showed to be positively related to both environmental protection and economic growth. However, the right of the government to internet monitoring decreased preferences for economic growth but not for environmental protection.

The ambivalence above poses questions about the right type of freedom and control affecting environmental and economic outcomes. As individual freedoms start and end with the freedoms of others, we can hypothesize that the preference for video surveillance in public places corresponds to the need to monitor the activities of fellow citizens, traffic, and other features of the outer environment. In the case of environmental protection, it is understandable as it allows more efficient environment monitoring and enforcement of environmental regulations. As concerned with economic growth (the country's priority), video surveillance ensures more safety (Sharma et al., 2022), more efficient crime abatement (Garibotto, 2010), and rule enforcement (Yesil, 2006).

Though video surveillance violates some human rights for privacy (Granholm, 1986), it is considered one of the most effective means for an emergency response to traffic or the environment (Noguera et al., 2011; Chung, 2012; Chen, et al., 2014). Video surveillance is also one of the most effective ways for real-time environment control (Stipanicev, et al., 2007) and an essential feature of smart cities (Korchani and Sethom, K. 2021).

Environmental regulations substantially disturb competition (Iraldo et al., 2011; Dechezleprêtre and Sato, 2017; Borsatto and Amui, 2019), though there are considerable efforts to integrate green policy into competition legislation (Kingston, 2010). However, our results report that the importance of competition significantly predicted a preference for environmental protection at the expense of economic growth and the preference for economic growth as a priority over other goals. This ambivalent result is still to be explained. Besides competition, the importance of work in life predicted a preference for economic growth.

6.2 Hypothesis 3: Religiosity predicts the preference for environmental protection.

The importance of God showed to positively predict environmental protection and negatively predict economic growth. The matter of environment is of immense importance in religious beliefs. In Islam, the environment bears much importance, and the rights and responsibilities of a man with respect to the environment are clearly stated (Omer, 2012). In Christianity, the belief in a controlling god is significantly associated with environmental guilt (Eom, et al., 2021a) and environmental justice forms one of the principles of eco-theology (Hrynkow, 2017). Surrendering Environmental Identities is viewed as one of the ways of becoming one with God (Roshani and Rathnasiri, 2018). The importance of God appears to be one of the significant predictors of environmental preferences, which should not be forgotten. On the other hand, the intrusion of religious authorities into secular processes in interpreting the laws showed to predict lower preferences for economic growth.

6.2.1 The country differences

Azerbaijan, Belarus, Georgia, Lithuania, and Ukraine report higher importance of economic growth as the most important

TABLE 3 Principal component analysis for individual freedoms as signs of democracy. Rotated Component Matrix.

	Democracy	Component	
		1	2
Civil rights and freedoms	Free elections	,775	-,032
	Gender equality	,746	-,033
	Civil rights protect liberty	,746	,120
	People receive unemployment benefits	,628	,255
The increased role of the state and religion, obedience	Religious authorities intrude on the secular state and interpret the laws	-,150	,749
	The army takes over when the government is incompetent	-,045	,728
	Obedience to authorities (people obey their rulers)	,221	,640
	The state provides more income equality	,360	,589
	Government fiscal policy increase income equality	,414	,451

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

aim of the country, while Estonia presented lower. Oppositely, Azerbaijan, Estonia, Georgia, Kyrgyzstan, and Ukraine showed more preference for environmental protection at the expense of economic growth compared to Russia, while Armenia, Belarus, Lithuania, and Tajikistan reported more preference for economic growth at the expense of environmental protection compared to Russia (controlling for all the variables presented in table Results).

6.2.2 Age, gender, education

Women prefer more environmental protection at the expense of economic growth compared to men. People with lower education place less importance on economic growth than higher-educated people.

7 Conclusion

The association between economic development and environmental degradation generally follows the U shape titled Environmental Kuznets Curve (EKC, Shahbaz et al., 2013; Stern, 2017; Anwar et al., 2022). Lower-income countries generally reside on the beginning part of the curve, meaning that economic development damages the environment, while more well-to-do countries present a more favorable increasing relationship between economic development and the state of the environment. The Post Soviet countries generally belong to the first part of the curve, meaning that economic development, if not corrected by environmental regulations, increases environmental pollution levels and generally damages the environment (Yang et al., 2017; Hasanov et al., 2019; Hasanov et al., 2023). Especially in these countries, the environment protection measures go against economic performance, and the tradeoff between more economic growth and environmental protection is more pronounced.

In this paper, we run Principal Component Analysis to study the structure of preferences for personal freedom and conducted logistic regression analyses to study the effects of preferences for individual freedoms on preferences for environmental protection at the expense of economic growth and economic growth as one of the country's priorities. We employed a representative sample from eleven Post Soviet Union countries (N = 20006, age 18+, M ± SD: 46,04 ± 17,07; 58% women, 46,8% upper education).The results suggest that personal freedoms (civil rights, importance of democracy, gender equality, income inequality, no role of army in politics) predicted preferences for environmental protection at the expense of economic growth and growth as opposed to other societal goals. However, the right of the government to surveillance in public areas, though diminishing personal freedoms in terms of anonymity, proved to be positively related to both environmental protection and economic growth as one of the country's priorities. Though environmental regulations generally decrease the firm competitiveness, the preferences for competition proved to predict higher preferences for environmental regulations.

Last but not least, religious beliefs proved to predict higher preferences for environmental protection but lower preferences for economic growth. In fact, in many religions, God is considered a part of the environment, and the rights and responsibilities of man to the environment are the central part of religious beliefs (Omer, 2012; Hrynkow, 2017; Eom, et al., 2021a). The role of religion in shaping individual preferences needs more research.

Overall, the results supported the view that even though environmental regulations generally reduce individual freedoms and obstruct economic performance in many cases, they are in line with the preferences for individual freedoms in many aspects. This may indicate the increasing understanding of a cleaner environment as an individual right that widens the spectrum of preferred individual freedoms. This result is rather optimistic, especially in the set of the Post Soviet Union countries, many of which are still struggling economically and yet consider the environment as a part of (or at least in line with) their individual freedoms.

TABLE 4 Predicting environmental protection vs. economic growth, economic growth vs. other goals. The results of ordinal regressions.

	Environmental protection (1) vs. economic growth (2)		Economic growth (1) vs. other goals (0)	
	Estimate	Sig.	Estimate	Sig.
Threshold	−0,616***	0,000	−0,132	0,422
Personal freedoms vs. government				
Government video surveys people	0,120***	0,000	−0,054**	0,005
Government monitors emails	−0,038	0,152	0,057*	0,024
The government collects information about anyone	−0,047	0,062	−0,012	0,609
Government responsibility should be increased	0,001	0,919	−0,004	0,489
Private vs. state ownership of the business	−0,003	0,693	0,007	0,341
Personal freedoms as signs of democracy				
Governments tax the rich and subsidize the poor.	0,000	0,953	−0,021**	0,004
People choose their leaders in free elections.	−0,011	0,254	0,011	0,212
People receive state aid for unemployment.	−0,008	0,335	0,016	0,057
The army takes over when the government is incompetent.	0,015*	0,031	−0,008	0,251
Civil rights protect people's liberty against oppression.	−0,045***	0,000	0,023*	0,012
Women have the same rights as men.	−0,027**	0,004	0,003	0,764
The state makes people's incomes equal	0,019*	0,018	−0,008	0,287
People obey their rulers	0,013	0,067	0,011	0,117
Importance of democracy	−0,030**	0,003	0,055***	0,000
Democracy in own country	0,004	0,631	−0,004	0,603
The importance of competition and work				
Competition is good or harmful	0,027***	0,000	−0,034***	0,000
Work important	−0,001	0,970	−0,105***	0,000
Income equality important	0,003	0,687	−0,002	0,736
Religiosity				
Importance of God in life	−0,039***	0,000	−0,038***	0,000
Religious authorities interpret the laws.	0,015	0,052	−0,031***	0,000
Countries				
Azerbaijan	−0,276**	0,003	0,451***	0,000
Armenia	0,466***	0,000	−0,004	0,958
Belarus	0,216**	0,008	0,528***	0,000
Estonia	−0,856***	0,000	−0,699***	0,000
Georgia	−0,812***	0,000	0,461***	0,000
Kazakhstan	0,017	0,852	0,042	0,620
Kyrgyzstan	−0,650***	0,000	0,150	0,087
Lithuania	0,798***	0,000	0,617***	0,000
Tajikistan	0,207*	0,015	0,005	0,956
Ukraine	−0,049	0,485	0,235**	0,001

(Continued on following page)

TABLE 4 (*Continued*) Predicting environmental protection vs. economic growth, economic growth vs. other goals. The results of ordinal regressions.

	Environmental protection (1) vs. economic growth (2)		Economic growth (1) vs. other goals (0)	
	Estimate	Sig.	Estimate	Sig.
Socio-demographic variables				
Age	0,000	0,747	0,002	0,149
Sex (Male)	0,226*	0,000	0,039	0,295
Lower education	0,054	0,440	−0,160*	0,016
Middle Education	0,053	0,211	−0,063	0,126
Pseudo R-Square				
Cox and Snell	0,075		0,044	
Nagelkerke	0,100		0,060	
McFadden	0,056		0,033	
N	12254		13101	
Sig.	0,000		0,000	

Link function: Logit; reference variables: female, higher education, Russia. *** significant at the 0.001 level (2-tailed). ** significant at the 0.01 level (2-tailed). * significant at the 0.05 level (2-tailed). Source: own computations.

TABLE 5 Summary of results of ordinal regressions (Formula 1; Table 5). Statistically significant associations.

Environmental protection at the expense of economic growth	Positive (+) / Negative (–)	Economic growth as the country's priority	Positive (+) / Negative (–)
Personal freedom vs. the role of the government. The government should have the right to (H1.i)			
Video surveillance in public areas	+	Video surveillance in public areas	+
		Monitor information exchanged on the internet	—
Personal freedom - the essential signs of democracy (H1.i)			
Civil rights protect people's liberty	+	Civil rights protect people's liberty	+
The subjective importance of democracy	+	The subjective importance of democracy	+
The army takes over when the government is incompetent	—	Governments tax the rich and subsidize the poor	—
The state makes incomes of people equal	—		
Gender equality in rights	+		
The attitude to competition and work (H2.i)			
Competition is good	+	Competition is good	+
		Work is important in life	+
Religiosity (H3.i)			
The importance of God in life	+	The importance of God in life	—
		Religious authorities interpret the laws	—

Source: own computations, Table 5.

These results suggest several implications. First, though environmental regulations may harm particular firms, society views the benefits it provides as a part of their freedoms. If communicated correctly, the measures are likely to gain social support. Second, the support for environmental protection measures should be studied jointly with other preferences for individual freedoms as they seem to form a specific system. Third, the broad society seems to be aware of environmental

impacts and, to at larger extent, recognizes the role of the environment even at the expense of economic growth. Thus the government may communicate the need for environmental protection as a part of individual freedoms for a clean environment.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found here: https://www.worldvaluessurvey.org/wvs.jsp.

Ethics statement

The studies involving human participants were reviewed and approved by Ethics committee Czech University of Life Sciences, Prague. The patients/participants provided their written informed consent to participate in this study.

Author contributions

Conceptualization, IC and LS; methodology, IC; data curation, AO; writing—original draft preparation, AO and DM; writing—review and editing, AO, LS, IC, DM, and SK; supervision, LS; project administration, LS; funding acquisition, LS. All authors have read and agreed to the published version of the manuscript. All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fenvs.2023.1129236/full#supplementary-material

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