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Prioritizing the environment or economic growth: Insights from the World Values Survey

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ABSTRACT

For a sustainable transition, it is relevant to analyse the perceptions of the population, as their awareness directly affects the effectiveness of the measures and policies implemented. To this end, the seventh wave of the World Values Survey (2017-2022) has been taken as a basis, which puts respondents at the dilemma of having to choose whether environmental protection or economic growth should be the top priority. First, the responses are analysed globally and then the database is limited in responses from China, the United States, and Germany. This provides a more detail vision of which factors may influence the prioritization of environmental protection over economic growth for each individual. Binary logistic regression reveals that there are differences between the responses of the three countries. Depending on the country, the factors that affect positively or negatively vary significantly, but all three countries agree that the level of education positively influences on priority people give to environment.

KEY WORDS

Economic growth, environmental protection, World Values Survey, binary logistic regression

RESUMEN EJECUTIVO

Para una transición sostenible es relevante analizar las percepciones de las poblaciones, ya que su concienciación afecta directamente a la eficacia de las medidas y políticas aplicadas. Para ello, se ha tomado como base la séptima olea de World Values Survey (2017-2022), que pone a los encuestados ante la disyuntiva de tener que elegir si la máxima prioridad debe ser la protección del medio ambiente o el crecimiento económico. En primer lugar, se analizan las respuestas a nivel mundial y, a continuación, se restringe la base de datos a las respuestas de China, Estados Unidos y Alemania. Esto proporciona una visión más detallada de los factores que pueden influir en la priorización de la protección del medio ambiente sobre el crecimiento económico para cada individuo. La regresión logística binaria revela que existen diferencias entre las respuestas de los tres países. Dependiendo del país, los factores que afectan positiva o negativamente varían significativamente, pero los tres coinciden en que el nivel de educación afecta positivamente a que las personas prioricen la protección de medio ambiente.

PALABRAS CLAVE:

Crecimiento económico, protección del medioambiente, World Values Survey, regresión logística binaria

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1. INTRODUCTION

In recent decades, the environment has become a key factor for economists in analysing the relationship between economic growth and protecting the environment of countries and the world. The urgency of the climate crisis has forced governments, scientists, and non-governmental organizations (NGOs) to come together and develop new ideas, policies, agreements, and narratives to transform our society towards sustainability. For sustainable transition to be achieved, not only is it relevant to work around economic indicators and models, but also a clear understanding of what are societies and individuals' attitudes towards the environment. There is extensive research about the environmental situation of countries and its contribution to CO2 emissions; but it is equally pertinent to examine and understand people's perceptions, as their awareness directly affects the effectiveness of the measures and policies implemented.

In view of this, the main objective of the present paper is to examine what is the priority of individuals under the constraint of having to choose between protecting the environment or economic growth in different countries and which factors affect the prioritization of one or the other. In order for the evolution to be sustainable, it is necessary to modify or even eliminate consumption and activity habits that could slow down the economy in the immediate future. For this reason, it is relevant to examine what people place as their top priority. As a central source of data, the latest wave of the World Values Survey questionnaire (2017-2022) has been used since it specifically addresses this dilemma. The responses from 90 countries will be analysed at an aggregate level and afterwards, for a more detailed approach, responses will be limited to China, the United States and Germany. These three countries represent a diverse range of economic and environmental contexts, which enables us to provide an in-depth overview of the factors that influence positively or negatively on selecting protecting the environment over the economic growth across countries.

The paper is structured as follows. Initially, it conducts a literature review on the discussion regarding economic growth and the environment, presenting both the approach that they are contradictory and complementary, as well as the main initiatives towards sustainability in recent decades. Following this, it delves into public opinion on the subject by analysing the responses of the 90 participating countries in the World Values Survey (2017-2022) and relating them with an economic and environmental indicator to find if the general situation of the country is related to the perception of the

citizens towards sustainability. Next, a more comprehensive examination is conducted focusing on the answers of United States, China, and Germany. At a descriptive level, we will see which factors may have an impact when prioritizing protecting the environment or economic growth or even provide other answer. A binary logit regression model is done with the dataset of these three countries to explore which factors significantly affect to select protecting the environment over the economic growth. Finally, the results are interpreted and the conclusions and limitations of the work are presented.

2. LITERATURE REVIEW

Historically, the relationship between economic growth and environmental sustainability has been a grand theme of economic theories and research (Mishan, 1967) (Meadows D., Meadows, Randers, & Behrens III, 1972) (Easterlin, 1974). In recent decades, the debate has become more pressing as the impacts of climate change and the urgent need for the reduction of greenhouse gas emissions become more evident (Victor, 2010) (Schneider, Kallis, & Martinez-Alier, 2010) (Anderson, 2015). A wide extent of different views and studies exist on the question of how economic activities affect the environment, ranging from those who believe that economic growth can complement environmental conservation (OECD, 2015) (Cohen, 2020) (The Nature Conservancy, 2018) whereas others consider that economic growth is environmentally unsustainable (Demaria, 2018) (Leggett, 2010) (Van den Bergh, 2012).

In the light of this debate, it seems justifiable to examine public opinion regarding this debate on economic growth, environmental protection and prosperity since political decisions in democratic countries are legitimate to the extent that they reflect public opinion (Drews, Antal, & van den Bergh, 2018). In fact, throughout the years a variety of surveys have been done across countries, which provide a range of different perspectives and data surrounding this topic such as Gallup poll surveys Pew Research Centre (2021) and European Commission (2020). Before examining the responses in World Values Survey around this debate, it has been seen pertinent to review the meaning or generalized definitions that people should attribute to economic growth and environmental protection concepts.

2.1 Definition of key concepts

"Economic growth" generally refers to an increase in production and consumption of the economic goods and services within a society, usually measured by Gross Domestic Product (GDP) or Gross National Product (GNP) (Roser, 2013). Nevertheless, it is important to keep in mind that economic growth must be achieved while there is an urgent need to reduce human impact on the environment (Roser, 2013). Indeed, this measure overlooks social costs, environmental impacts, and income inequality so that recently the usage of new metrics has been proposed (Costanza, et al., 2014).

"Environmental protection" according to the definition provided by the United Nations involves "*any activity to maintain or restore the quality of environmental media through preventing the emission of pollutants or reducing the presence of polluting substances in environmental media*" (United Nations, s.f.). It is widely known the importance of achieving this and precisely, the Organisation for Economic Co-operation and Development (OECD) works to address the economic, social, and environmental challenges of globalization (OECD, 2009).

Degrowth scholars maintain a sceptical view of the feasibility of pursuing environmental protection alongside economic growth and claim that only a downscaling of economic production and consumption can avert environmental damage (Van den Bergh, 2012). Nevertheless, the general discourse on growth remains positive and confident. Paul Krugman, public intellectual and Nobel prize winner in Economics, has several times devoted attention to questions of growth and the environment in his New York Times column and, precisely the most recent one defends that growth can be green (Krugman, 2023). International institutions, especially World Bank and OECD, are optimistic in this approach as well thanks to the so-called "green growth" that advocates economic growth and development while preserving the natural resources that make our lives possible (OECD, 2011).

2.2 The Environmental Kuznets Curve

As mentioned before, the relationship between economic growth and the environment has been extensively studied by plenty of scholars and there is a significant body of economic theories surrounding this issue, but The Environmental Kuznets Curve (EKC) may be the most popular one in the last decades. Suggested by Gross and Krueger (1995), this approach refers to the theory of an inverted U-shaped relationship between per capita economic output and some environmental quality variables (Grossman &

Krueger, 1995). In the initial stages of economic growth, as GDP per capita increases, so does environmental degradation, but it reaches a threshold at which increases in GDP per capita lead to reductions in environmental damage (Grossman & Krueger, 1995).

Certainly, environmental quality can be measured in different dimensions, yet aggregating them into a single indicator would lead to misleading conclusions. Henceforth, this type of relationship has been hypothesized in a wide range of different environmental indicators such as carbon dioxide (Shahbaz & Sinha, 2019), sulphur dioxide emissions (Krueger & Grossman, 1991); urban air quality (Daniel.C & Michael E, 2005); deforestation (Ehrhardt-Martinez, M. Crenshaw, & Jenkins, 2002), heavy metal contamination (Grossman & Krueger, 1995) and waste (Mazzanti & Zoboli, 2009). However, the results of EKC estimations for those different measures are diverse. Consequently, it is not viable to assume a unique curve for all types of environmental degradation, which in turn raises doubts about the generalizability of the EKC hypothesis (Aşıcı, 2013).

Since the shape and timing of the curve may vary depending on the context, the data used and the methodology, it is dangerous to presume that economic growth itself will automatically improve the environmental situation (Atwi, Barberán, Mur, & Angulo, 2018). Indeed, it is more convenient for countries to implement institutional reforms towards a sustainable model (Van den Bergh, 2012).

2.3 Limits to Growth Theory

There is a wide extent of theories as well with a completely different and pessimistic vision describing the economy-environment relationship. One of the most influential and controversial theories may be the Limits to Growth Theory, presented in Meadow's book in 1972 (Meadows D., Meadows, Randers, & Behrens III, 1972). The book published by The Club of Rome considered that by the middle of the twenty-first century, the world economic system would collapse owing to the environmental limits (Perman, Ma, McGilvray, & Common, 2003). This prediction was based on the results of a study of a computer modelling, World3, that analyse the long-term trends in particularly five subsystems: population growth, industrialization, environmental degradation, widespread malnutrition, and resource depletion (Perman, Ma, McGilvray, & Common, 2003). The conclusion reached was that if these trends continued, the world would face severe environmental and social consequences in the subsequent decades (Bardi, 2011).

A major argument of the Limits to Growth theory, and reinforced in the following publications, was that exponential population growth and economic growth would eventually deplete the Earth's finite resources (Bardi, 2011). In the end, this would lead to a decline in industrial production and agricultural output, which eventually would result in a global economic collapse (Perman, Ma, McGilvray, & Common, 2003). The authors of the study argued that the only way to avoid these dire outcomes was to implement radical changes in human behaviour, policies, and technology (Turner, 2008). In the following years, a sequel of this theory was published in 1992, entitled Beyond the Limits and the difference between both publications was minimal, in fact, it further supported the conclusions drawn from the previous book (Meadows, Meadows, & Randers, 1992).

Despite dire warnings of a potential worldwide collapse, the Club of Rome in subsequent publications reported that the forecasts for the global future were even more pessimistic since no modern political parties considered its recommendations (Meadows, Randers, & Meadows, 2004, p. 16). The reason behind this may be that the Limits to Growth theory has been subject to several criticisms and limitations. One of the main criticisms is that the study did not contemplate the potential for technological innovation and adaptation, which could help to mitigate the environmental and social impacts of economic growth (Gardner, 2004).

From the publication of this theory, the scenario presented by the World3 model in 1972 has been compared with data from the following 30 years. The comparison concludes that the observed historical data for 1970-2000 most closely matches with the stimulated results presented in World3 model (Turner, 2008). This evidence the urgency of the imminent necessity of taking action by governments, international institutions and societies to achieve a transition to a more sustainable model.

2.4 Brundtland Report

In the wake of this literature, it is worthwhile to consider the “Our Common Future” publication released in 1987 by the World Commission on Environment and Development (WCED), often referred to as Brundtland Report, that introduced for the first time the concept of sustainable development and described how it could be achieved (Perman, Ma, McGilvray, & Common, 2003). "Sustainable development" is an approach to economic growth that seeks to balance economic, environmental, and social factors in a way that promotes long-term well-being for both present and future

generations (United Nations, 2020). This means meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987).

The report clarifies the idea that the environmental challenge and development are inextricably interconnected (WCED, 1987, p. 7). Development cannot persist on a deteriorating environmental basis; the environment cannot be protected when growth overlooks the costs of environmental protection (WCED, 1987, p. 36). Indeed, it identifies several economic and social issues that threaten sustainable development, including population growth, poverty, environmental degradation, and unsustainable patterns of production and consumption. It emphasizes the importance of addressing these issues through integrated policy approaches that balance economic, social, and environmental objectives (WCED, 1987, p. 51). Hence, it is worthwhile to obtain a vision of all countries' performance no matter their development status since it is responsibility of all to make a change.

In fact, the resource gap between most developing and industrialized countries is expanding, and the industrialized world dominates some key international organizations and has already depleted most of the planet's ecological capital. This global inequality is one of the main environmental problems as well as its main development problem (WCED, 1987, p. 14). Consequently, developing regions' futures depend on the levels and patterns of growth in industrialized nations, which, for their growth to be environmentally sustainable they need to develop towards less material- and energy-intensive activities and the improvement of their efficiency in using materials and energy (WCED, 1987, p. 47).

2.5 2030 Agenda

One of the key outcomes of the Brundtland Report was the adoption of the 2030 Agenda for Sustainable Development by the United Nations in 2015. The Sustainable Development Goals (SDGs) are a set of 17 goals and 169 targets that aim to end poverty, protect the planet, and ensure prosperity for all (United Nations, 2015). The SDGs have gained widespread support and recognition globally, with governments, organizations, and individuals around the world taking action to contribute to their achievement. They provide a shared vision and a roadmap for sustainable development, guiding policies, strategies, and actions at all levels. China, the United States and

Germany are among the 193 member states of the United Nations that approved the 2030 Agenda to accomplish the SDGs.

The SDGs are based on the principles of sustainable development outlined in the Brundtland Report and provide a roadmap for global sustainable development efforts (United Nations, 2015). Notice that the optimal solution to the world's problems relies on new patterns of thinking, new moral and value criteria, and, fundamentally, new behaviours (WCED, 1987, p. 38).

It has been deemed necessary to mention this as it is the main global approach to address the negative consequences of climate change and the degree to which a country is committed to the objectives can influence people's perception of environmental protection.

3. METHODOLOGY

The basis of the analysis resides in the seventh wave of the World Values Survey (WV S), which collects responses from individuals from 90[1] low, middle and high-income countries around the world dating from mid-2017 until December 31, 2021. This academic study covers a full range of global variations, from very poor to very rich societies in all major cultural areas of the world (Haerpfer, et al., 2020). The international research program studies social, political, economic, religious, and cultural values around the world to analyse their influence on the development of countries and societies over time. By conducting regular surveys since 1981 covering most of the world's countries, and making the data freely available, the project gives us a very broad view and allows us to gain a better understanding of mass values and their effects.

Its main objective is to analyse how stability or change in these values influence the social, political, and economic development of countries and societies over time. For the sake of this, the main method of data collection in the WVS survey is the face-to-face interview in the respondent's home or place of residence. Although other interview

[1] Albania, Andorra, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bolivia, Bosnia Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Cyprus, Czechia, Denmark, Ecuador, Egypt, Estonia, Ethiopia, Finland, France, Georgia, Germany, Greece, Guatemala, Hong Kong SAR, Hungary, Iceland, Indonesia, Iran, Iraq, Ireland, Italy, Japan, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Latvia, Lebanon, Libya, Lithuania, Macau SAR, Malaysia, Maldives, Mexico, Mongolia, Montenegro, Morocco, Myanmar, Netherlands, New Zealand, Nicaragua, Nigeria, North Macedonia, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Puerto Rico, Romania, Russia, Serbia, Singapore, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Tajikistan, Thailand, Tunisia, Turkey, Ukraine, United States, Uruguay, Venezuela, Vietnam, Zimbabwe

methods were also used such as postal surveys, self-administered online and telephone interviews (in combination with other survey techniques). At the same time, the WVS comprises an international network of social scientists and researchers from 120 countries and societies worldwide.

Regarding the economic and environmental debate, a concrete question has been selected from the seventh wave WVS to analyse the perception of individuals regarding this problem. This question places respondents in the position of having to choose between the environment and economic growth, which is formulated as follow:

Q111. 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?

A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs.

B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.

Although the question is presented as a dichotomous choice between the two matters, there is also the possibility of the resulting answer to be *other answer, Don't know or no answer*. The combined data was sourced from the online *World Values Survey Data analysis tool*, which enables direct examination of the answers.

First, an analysis will be conducted of the aggregate responses of this question for all countries covered by the survey, along with the economic and environmental performance of each country. In this paper, the World Bank's GDP per capita PPP (in US$) and the Yale Centre for Environmental Law & Policy's 2022 Environmental Performance Index (2022 EPI) have been utilized, and the reason for their inclusion will be explained upon. This procedure attempts to identify any relationship with the perception of individuals towards prioritizing environmental protection and the economic or environmental situation of their country of residence.

To continue with, for the purpose of a more detailed analysis of the responses, the database has been limited to three countries in particular: China, United States and Germany. China and the United States were chosen due to their significant global economic influence and environmental impact, making the findings of this study relevant on a global scale. Additionally, with the growing focus on the climate

emergency in Europe as reflected in the energetic transition that is facing, Germany, being a prominent economic force in the region, can serve as a representative example. From this part onwards, the data set for the three countries was elaborated from the database downloaded from the World Values Survey website.

Continuing at an aggregate level, a range of bar charts present a cross-section of the proportion of individuals who gave each response in these three countries (prioritizing the environment, economic growth, or other answers) and different socio-demographic and occupational characteristics with the intention of identifying any relationship between attitudes towards the environment or the economy and their economic or social situation. Even though the proportion of *other answers* is relatively small in comparison to the other two, it is deemed significant to the study as it may indicate an attitude towards other alternatives such as sustainable development (described in the literature review section). Of all the sociodemographic, political, and economic factors analysed by the World Values Survey, the variables selected for this analysis were the following:

Age

Age is a significant factor that influences the attitudes, preferences, and behaviour of individuals. Generational gaps in life experiences, values, and tastes can result in stark differences between younger and older individuals.

Respondents in the survey indicate their age and then the survey recorded in six intervals ranging from individuals who are 16 until individuals older than 65 years old. This is represented with code X003R in the survey.

Place of residence

Pollution in cities is a widely recognized issue, and exposure to it may impact individuals' environmental concerns. On the other hand, in rural areas, where people may be more connected to nature and rely on natural resources for their livelihoods, priorities may be more focused on agriculture, livestock or other economic activities.

In WVS, place of residence (H_URBRURAL), is determined between urban, which refers to people living in cities and rural, representing people living in villages or towns.

Education level

The education level plays a key role in attributing importance to economy or environment. It is well-known accepted by education that environmental concerns are

influenced by education level, which enhances awareness and knowledge about environmental issues and their consequences.

The variable used recorded the education in three levels (Q275R): lower, middle and higher. Low represents until lower secondary education; middle until post-secondary non-tertiary education and finally, high level gathers from short -cycle tertiary education until doctoral or equivalent.

Employment status

The occupation or employment status is a key characteristic among the population and shapes all other aspects of life, including concern for the environment. Due to the availability of time, personal values, access to information and the extent to which one's occupation is linked to the environment can all influence the level of engagement with environmental issues.

The question that addressed this matter constituted eight options: Full time (30 hours a week or more), Part time (less than 30 hours a week), Self-employed, Retired/pensioned, Housewife not otherwise employed, Student, Unemployed, Other.

Income level

The income level of individuals, which is closely related with their employment and wages, has a profound impact on several aspects of their lives. It directly affects the resources they can allocate towards environmental issues. Although a direct relationship between income and environmental concerns may not have been evident at the aggregate level, studying it at the individual level remains critical as it plays a pivotal role in shaping people's attitudes and priorities.

In the survey, income level (Q288R) is also recorded in three levels: low, middle and high. Low represents steps from 1 to 3, middle steps from 4 to 7 and high from 8 to 10.

After describing the effect of these variables in the responses, a statistical analysis of the responses from China, United States and Germany is performed for a clearer perspective on the characteristics affecting the probability that a citizen from one of these countries would select as a top priority prioritizing the environment over economic growth. To this end, it has been determined to restrict the responses to a dichotomy format, distinguishing between individuals who prioritize the environment and those who prioritize economic growth. The distinct variables may reveal some

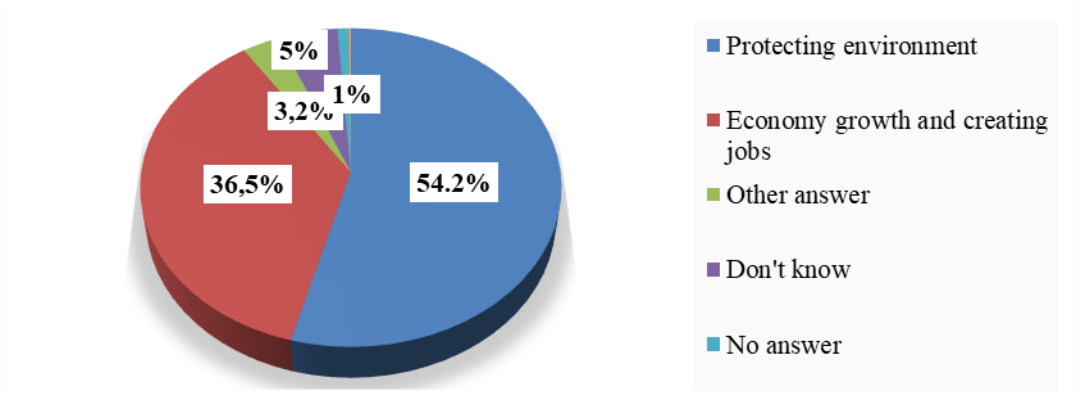
causes that increase or decrease the likelihood of placing more importance to the environment or in turn, to the economic growth. The abovementioned variables will as well be used to do the regression model at individual level. Since the dependant variable is a binary variable, the analysis consists of a logit model.

4. AGREGGATED ANALYSIS

5. 4.1 Protecting the environment vs. economic growth

Figure 1 illustrates the responses for question 111 in the World Values Survey of all participating countries in the questionnaire. Considering the five response possibilities mentioned above and the missing answers, the dataset consists of 153,950 responses from 90 countries. The results obtained from the *WVS data online tool*, reveals a tendency towards environment prioritization when forced to choose between both, with a result of 54.2% (83,417 individuals). Alternatively, 36.2% (56,230 individuals) prioritize economic growth and creating jobs; 3.2% give other answer; 5% of the respondents did not know what to answer; 1% of respondents did not answer the question and 0.2% answers were missing.

Figure 1. Results 7th WVS: 2017-2022. Individuals from 90 countries.



Source: Own elaboration using data from World Values Survey Data online tool.

At the country level, the country that tends to prioritize the environment the most is Sweden with 85.4% and the country that tends to prioritize the environment the least is Lithuania with 30%. It is noteworthy that there is a significant disparity between Sweden and the country with the second highest percentage of respondents who prioritize environmental protection, indicating a notable difference between the two. This country is Andorra with 72.6%, which represents a substantial difference of 12.8%

compared to Sweden. and the list continues with Indonesia (72.1%), Vietnam (71.7%) and Bolivia (71.4%).

Referring to the countries where the population gives the least priority to the environment are: Lithuania with 30% and just before it the following countries are: Egypt (31.7%), Latvia (32.8%), Tunisia (33.1%) and Japan (33.6%). In the annexes are the results of all countries.

Based on these results, the interest is to analyse whether the difference in responses between prioritizing protecting the environment or economic growth and creation of jobs is related to either the economic or environmental situation of the country in question. To do so, the results of question 111 will be related with two indicators, GDP per capita converted by PPP in current international dollars and 2022 Environmental Performance Index (EPI).

4.2 Protecting the environment and GDP pc PPP in (US$)

On the economic front, it has been taken as a basis the Gross Domestic Product (GDP) since it has been a fundamental tool for assessing the economic situation of a country as well as it serves to measure production and transactions carried out by "*all the firms, non-profit institutions, government bodies and household*" over a given period within the country's economic period (Lequiller & Blades, 2009). GDP has become a global standard for assessing economic performance (Callen, 2008) and therefore, it has been selected as an aggregate measure to examine whether there exists a correlation between GDP and the percentage of respondents that prioritize protecting the environment over economic growth.

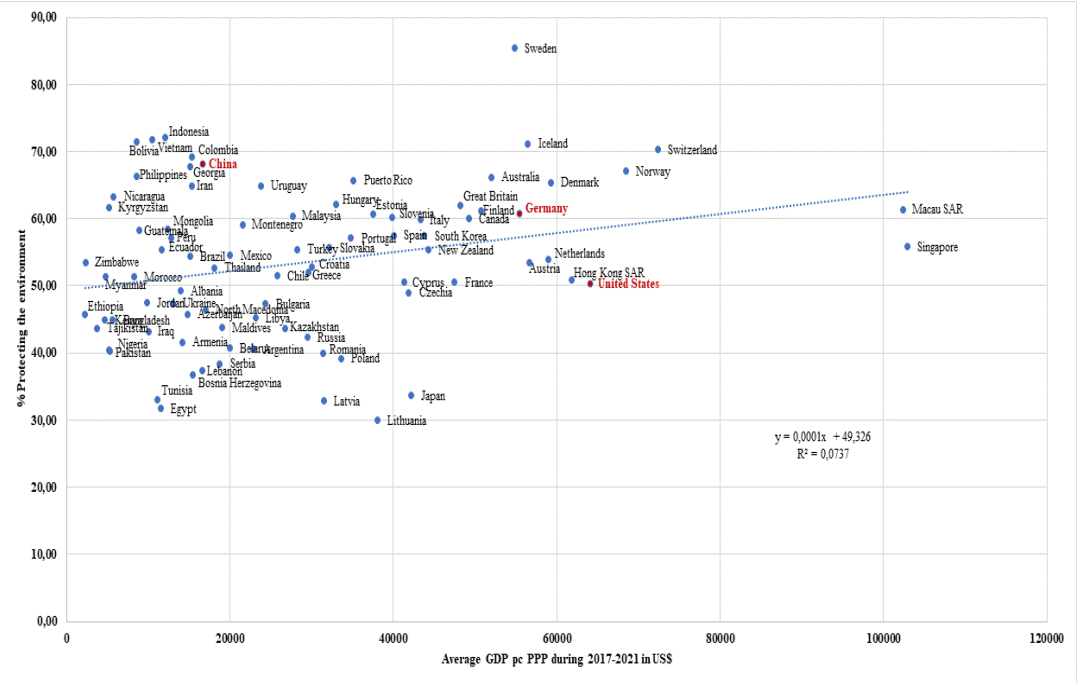
Precisely, in this paper it has been used per capita values for gross domestic product (GDP) expressed in current international dollars converted by purchasing power parity (PPP). However, it is worth clarifying what PPPs are and the reason to use it in this paper. Briefly, PPPs are price relatives, which show the ratio of the prices in national currencies of the same goods or services in different countries (Schreyer & Koechlin, 2002). The weight of a country's GDP in the overall result depends on the size of its economy compared to other countries. To acquire these weightings, a country's GDP in local currency is converted to a common currency (in practice, the US$). Any analysis that overlooks cross-country differences in the prices of non-traded goods will underestimate the purchasing power of consumers in emerging and developing countries and,

consequently, their overall welfare. As a result, PPP is widely regarded as a better indicator of overall welfare (Callen, 2017).

The per capita GDP converted by PPP in current international dollars has been obtained from the World Bank (WB) and the reporting period oscillates between 2017 and 2021 as this is the period during which the survey was conducted. The average GDP per capita PPP in US$ between such periods has been self-elaborated from the data obtained in the World Bank database.

In Figure 2, GDP pc PPP (in US$) is plotted on the horizontal axis and the percentage of individuals' towards protecting the environment in the vertical axis, both in linear scales. Each dot represents the values for each of the participating countries, except for Andorra, Taiwan, Northern Ireland, and Venezuela, which lack information of income per capita in the World Bank database. Since in the following sections a more detailed analysis of the USA, China and Germany will be done, they are highlighted in red in the graph.

Figure 2. Relationship between the average GDPs per capita PPP (2017-2021) and percentage of respondents prioritizing protecting the environment by country.



Source: Own elaboration with the data obtained from WVS survey and World Bank.

In general, the scatter plot shows a non-significant correlation between the percentage of people who prioritize protecting the environment and the average GDP per capita PPP (in US$) of that country. Certainly, the coefficient of determination (or R squared) is equal to 0.0737, to be interpreted as just 7.37% of the variability of prioritizing the

environment can be explained by the variability of GDP per capita in international US$ using the linear regression model. This suggests that the economic situation of individuals in a country is not related with the inhabitant's prioritization of environmental protection over economic growth. Indeed, within the countries with a relatively low average GDP per capita PPP (mainly non-European), there is a great difference in percentages of people towards protecting the environment, ranging from 30% to more than 70%.

On the other hand, all those countries that have an average GDP per capita greater than US$60,000 reflect a percentage higher than 50% of prioritizing the environment. Hence, this suggests that albeit there is a weak relationship between both variables, it can be concluded that if the economic situation is highly favourable in a country, the population of this may tend to place a higher priority on environmental protection. Nevertheless, if the GDP per capita is low the attitudes of individuals towards protecting the environment are not clear so that this suggests that other factors may play a role in the attitudes of individuals.

When examining China, Germany, and the USA, it is apparent that they exhibit differences in terms of GDP per capita in PPP (in US$) and environmental concern during the specified period. The respective values for the average GDP per capita PPP (2017-2021) are as follows: China (16,583US$), Germany (55,337 US$) and USA (64,026 US$). China, with the lowest GDP per capita with respect to Germany and USA, registers the highest percentage of individuals towards protecting the environment (68.2%). Alternatively, the USA, with the highest GDP per capita PPP (in US$), has the lowest environmental concern (50.4%). Germany, on its side, although showing greater environmental awareness than the USA, is still below China (60.9%).

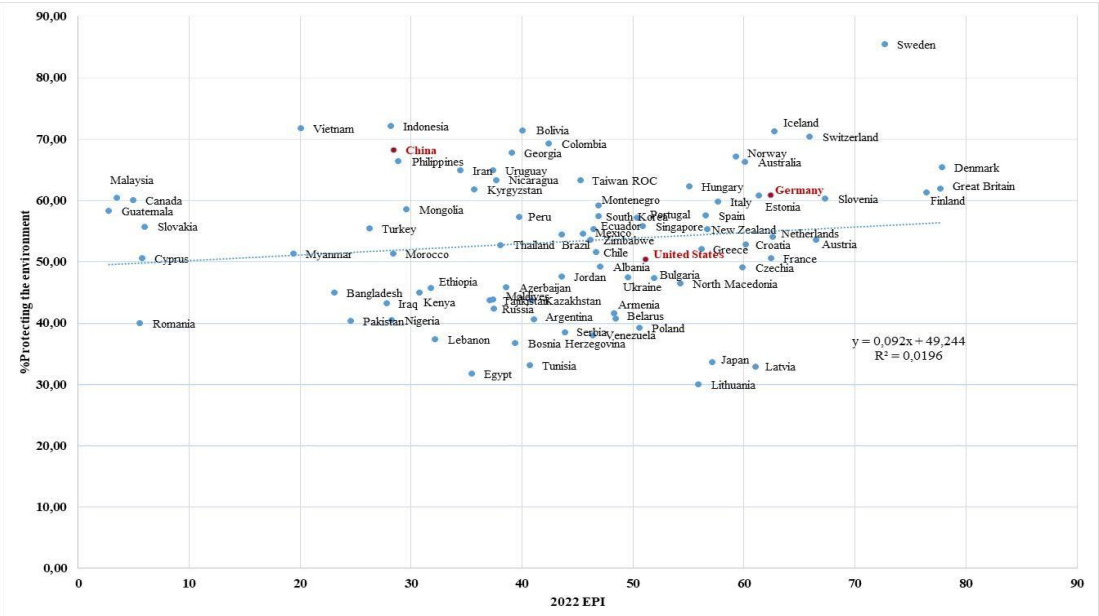
4.3 Protecting the environment and 2022 EPI Index

GDP as a macroeconomic measure, fails to measure the national welfare since it does not consider things that may be significant for the common well-being of the society such as environmental degradation, reduction of leisure time or the depletion of non-renewable natural resources (Callen, 2008). For this reason, it has been considered pertinent to compare it with an environmental indicator in pursuit of identifying, in this case, if there is a relationship between the environmental performance of the countries and the attitudes of individuals towards protecting the environment.

Despite the presence of other environmental indicators, the 2022 Environmental Performance Index (EPI) has been selected from Yale Centre for Environmental Law & Policy and the Centre for International Earth Science Information Network (CIESIN) at Columbia University. The distinctive feature of the EPI is its methodology of ranking countries based on their progress towards predefined policy targets, rather than solely their status, making it a forward-looking indicator (Emerick, 2023). By measuring 40 performance indicators across 11 issue categories, the EPI ranks 180 countries on their progress toward improving environmental health, protecting ecosystem vitality, and mitigating climate change (Wolf, 2022). This distinctive approach offers a fresh perspective on environmental priorities (Emerick, 2023). Those with a high score indicate better environmental performance with that of other countries (Wolf, 2022) and enables identification of areas where investments can yield the greatest impact on both human well-being and conservation efforts (Emerick, 2023).

Following the structure of the previous graph, the percentage of individuals prioritizing protecting the environment is plotted in the vertical axis and the 2022 Environmental Performance Index on the horizontal one. No data was obtained for Andorra, Hong Kong, Libya, Macau SAR, Northern Ireland, and Puerto Rico for the 2022 EPI score, so each point represents the range of 84 countries that participated in Wave 7 of the World Values Survey: 2017-2022 and have a 2022 EPI score. Here again China, USA and Germany are highlighted in red.

Figure 3. Relationship between 2022EPI and percentage of respondents prioritizing protecting the environment by country.



Source: Own elaboration from the data obtained in WVS survey and EPI website.

The graph does not illustrate a clear relationship for these two variables either. The value of the R-squared (r=0.0196) represents a very weak effect of the environmental performance of the country (2022 EPI index) on the attitudes of individuals of such countries towards protecting the environment. It is interesting to detect that in those countries with a 2022 EPI lower than 40, the percentage of people who prioritize protecting the environment varies between 40% and 70%, which is rather a large range. Although it may be thought that when the environmental performance of countries is weak (according to the 2022 EPI score), the population is more concerned towards environment; in reality the graph reveals that national opinion differs significantly across countries and consequently it suggests the necessity to take into account other factors that affect public opinion. However, if we look at countries with a 2022 EPI score of 50 or higher, most of the countries are European with a relatively high proportion of individuals prioritizing the environment, highlighting Sweden which has 85% and scores 72.7 in EPI. When a country obtains a highly favourable environmental conditions and a correspondingly high EPI score, it is often observed that a significant proportion of its population is environmentally conscious. This implies that even if maintaining these conditions requires a trade-off with economic growth, the population is willing to prioritize environmental preservation. Yet, there are multiple factors beyond a country's economic or environmental performance that influence public opinion when it comes to prioritizing either environmental protection or economic growth and job creation.

Now, focusing on China, Germany, and the USA, it is observable that China, which is the most environmentally conscious among these three, has the worst environmental conditions with a score of 28.4. While Germany and the United States, which scored lower percentage in the survey, have a higher 2022EPI score, 62.4 and 51.1, respectively. The significant variation in environmental performance and concern between China, Germany, and the USA, motivates the need for statistical analysis.

After conducting a descriptive analysis of question Q111 at the country level using aggregated indicators and finding no apparent relationship, it is now opportune to cross-check these results with various sociodemographic and employment factors to gain a more comprehensive understanding. The purpose is to find any relationship between the percentage share of those who prioritize environmental protection, economic growth or

provide other answers and their sociodemographic and/or economic situation in their country. For this reason, the remainder of this paper is focused on China, the United States, and Germany.

4.4 Countries' responses by categorical features

China, United States and Germany are relevant to analyse due to their economic importance, population size and environmental footprint. Furthermore, each one represents a unique perspective in the debate about economic growth and environment.

China, being the world's second most populated country and a rapidly growing economy, faces notable challenges due to air and water pollution, land degradation, and greenhouse gas emissions resulting from its swift economic development. Despite taking measures such as setting emission reduction targets and promoting cleaner technologies, China continues to grapple with significant hurdles in its efforts to achieve a harmonious balance between economic growth and environmental conservation (Liu & Raven, 2010). Hence, it is significant to address the perceptions of individuals in relation with the environmental challenges of the country as development progresses.

The United States is the largest economy in the world, and it has been one of the world's largest economies and has been a historic leader in the production of greenhouse gases and other pollutants together with China. The most recent report from the American Lung Association reveals that 40% of people are residing in regions with polluted and unhealthy air. According to a survey conducted by the US Environmental Protection Agency (EPA), approximately half of the country's rivers and streams and more than one-third of its lakes are polluted and not suitable for swimming, fishing, and drinking. Thankfully, in 2021, President Joe Biden took a significant step towards environmental protection by signing an executive order for the United States to re-join the Paris Agreement, a global agreement signed by 194 countries.

Germany is renowned within Europe and across the world for its pioneering role in green technologies and its emphasis on transitioning to renewable energy sources. It has implemented rigorous environmental policies and regulations. As part of its collaboration with the European Union, Germany has implemented regulations that increasingly address environmental concerns. During the Kyoto Protocol period, while the EU pledged to reduce greenhouse gas emissions by 8 percent by 2008-12 compared to 1990 levels, Germany committed to a more ambitious target of 21 percent reduction.

Germany has set a goal to reduce its greenhouse gas (GHG) emissions by 80 percent by 2050, compared to 1990 levels. Additionally, the country aims to have renewable energy sources account for 60 percent of its total energy consumption.

On the other hand, the categorical variables selected have also been obtained from the World Values Survey wave 7: 2017-2022: age; place of residence, education level, income level and employment status. A comprehensive description of these variables can be found in the methodology section.

First, recall that the responses examined for this part of the analysis have been the selection between "*protecting the environment*", "*economic growth and the creation of jobs*" or "*other answers*". Even though the proportion of *other answers* is relatively small in comparison to the other two, it is deemed significant to the study as it may indicate an attitude towards other alternatives such as sustainable development (described in the literature review section). Nevertheless, "don't know" and "no answer" responses have been excluded in the analysis as it is considered that no definitive conclusions can be drawn from these responses. For this reason, the percentages vary slightly from those utilized in the above aggregated analysis. Therefore, this new dataset reflected in the following table indicates the proportion of responses that choose protecting the environment and the proportion that chose economic growth and creation of jobs in each country.

In consideration of the abovementioned, the data set with which this study will continue comprises the responses of a total of 6,712 individuals, where 41.82% (2,808 respondents) corresponds to China, USA 37.2% (2,498 respondents) and Germany 20.98% (1,409 respondents).

Table 1. Percentage of respondents for Q111.

Countries	Protecting the environment	Economic growth	Other answer
China	68.90	26.01	5.09
Germany	66.26	29.05	4.69
United States	53.26	36.64	10.09
Total	**62.53**	**30.60**	**6.87**

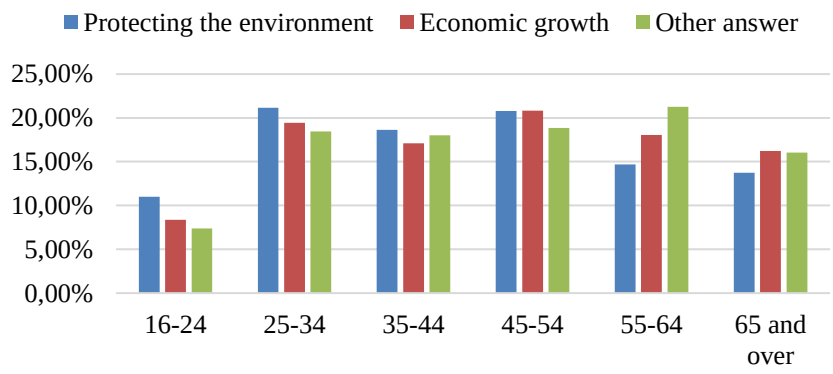
Source: Own elaboration with data obtained from WVS. China (2018), Germany (2018), USA (2017).

To continue with, these responses will be examined by cross-checking them with a range of categorical variables, more specifically, age, place of residence, education

level. The reason of selecting these characteristics has been explained in the methodology section. The figures below compile all the data from the United States, China and Germany, allowing to identify which groups in society are more inclined to protect the environment, economic growth or provide other answer.

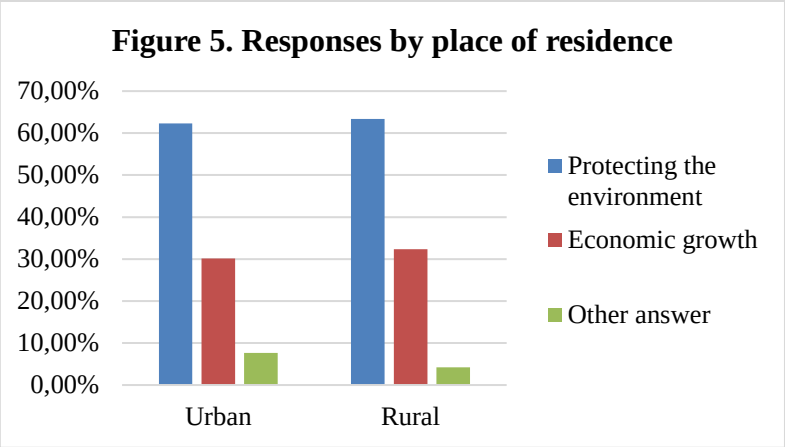
Based on the figure below, it is observed that until the age of 44, the aggregate population of the three countries prioritize protecting the environment, in the range of 45-54 the proportion between both issues is fairly balanced and then from the age of 55 onwards, people prioritize economic growth. In general, it is noticeable that the proportion of responses for the environment decreases as the age of respondents increases. The opposite is true for responses on economic growth: the higher the age range, the higher the proportion of people who consider it a top priority. It is also noteworthy the proportion of other responses, suggesting that over time people become aware of alternatives other than opposing the two objectives.

Figure 4. Responses by age



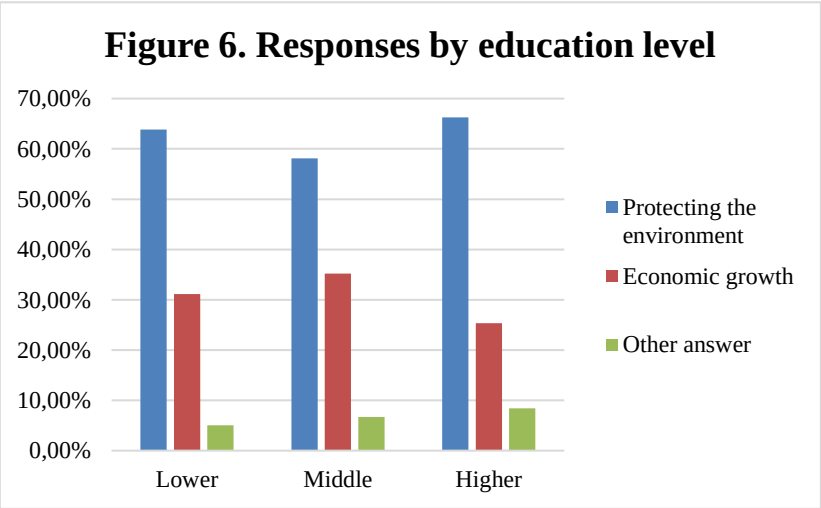
Note: Data are an aggregation of responses from China (2018), Germany (2018) and the USA (2017).
Source: Own elaboration with data from World Values Survey 7th wave.

In relation to place of residence, there is a greater proportion of people prioritizing the environment over economic growth in both urban and rural areas. Indeed, the proportion for both areas are almost identical. At first, the data suggests that there may not be significant differences in the preferences of urban and rural residents when choosing to prioritize the environment. Yet, it is observed that the proportion selecting economic growth is relatively slightly higher among the inhabitants of rural areas. Nevertheless, it is noteworthy to clarify that the proportion of respondents living in cities is far larger compared to those living in rural areas, so that this could derive biased conclusions.



Note: Data are an aggregation of responses from China (2018), Germany (2018) and the USA (2017).
Source: Own elaboration with data from World Values Survey 7th wave.

Figure 6 illustrates that for all levels of education the proportion of people prioritizing the environment is remarkably high. In fact, the proportion is even higher for people with a higher level of education. Among people with middle-level education, although the majority tend to prioritize the environment, the percentage is relatively lower and they represent the relatively higher percentage towards economic growth. which is noteworthy because the majority of the population belong to this level. The proportion of "other answers" is slightly greater, the higher is the level the education, which suggests that they are aware of a wider range of possibilities when they are more educated.



Note: Data are an aggregation of responses from China (2018), Germany (2018) and the USA (2017).
Source: Own elaboration with data from World Values Survey 7th wave.

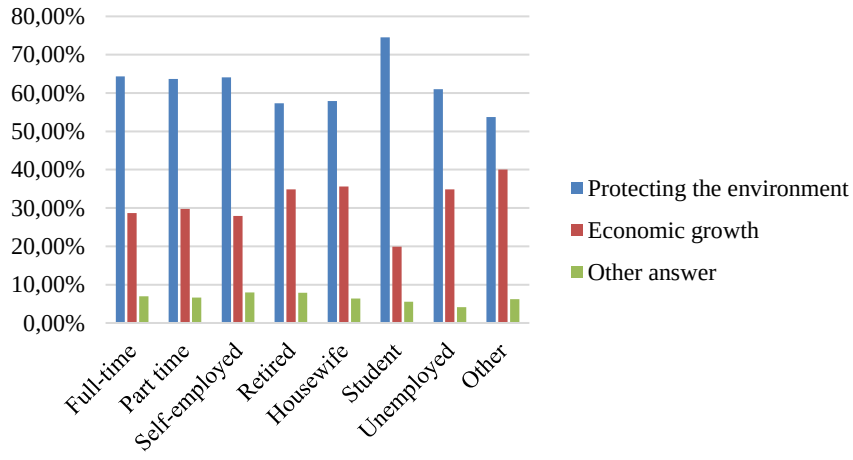
Regarding employment status, it is relevant to note that full-time employees are the most representative group for the three countries. At first sight, it is clear that in all occupation statuses the top priority is protecting the environment, but in different proportions. Full-time, part-time and self-employed have similar proportion of

responses for both the three answers, representing 64% for protecting the environment, around 30% for economic growth and 7% for other answers. Retired and housewives represent the lowest proportion for protecting the environment with around 57% choosing this answer and 35% choosing economic growth.

Among students, there is the highest level of environmental concern, accounting for 75% of respondents and only 19% choosing economic growth. It is logical in the sense that, being in the process of completing their education, they are more informed about current environmental challenges and are more likely to prioritize the environment. Surprisingly, unemployed people account for similar proportion in responses as full-time, part-time and self-employ people. 35% of unemployed choose economic growth, but it was expected this proportion to be higher since they may pay attention on policies that promote economic growth and job creation.

Although the proportion of people choosing "other answer" is relatively low, it is relevant to recall that probably these people wanted to emphasize that they had a different perspective in this debate.

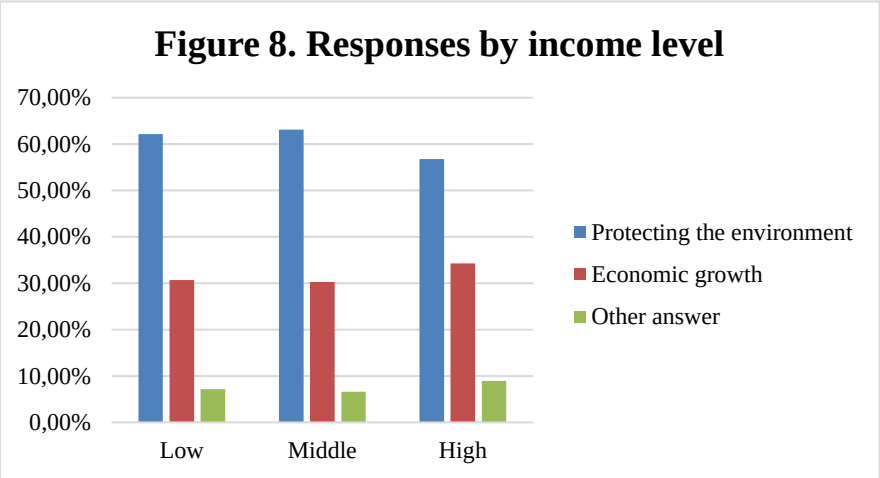
Figure 7. Responses by employment status



Note: Data are an aggregation of responses from China (2018), Germany (2018) and the USA (2017).
Source: Own elaboration with data from World Values Survey 7th wave.

Finally, regarding the income level of respondents, it is observable that people belonging to low- and medium-income levels have similar proportions when choosing between environmental protection (around 62%) and economic growth (around 30%). For people belonging to the high-income level, the proportion selecting economic growth is higher, with 35% of respondents and for protecting the environment is relatively lower with 56%. Respondents belonging to high income levels tend to

prioritize economic growth, although the proportion of other answers is also remarkable.



Note: Data are an aggregation of responses from China (2018), Germany (2018) and the USA (2017).
Source: Own elaboration with data from World Values Survey 7th wave.

An overall reading that could be derived from these results is that most people participating in the World Values Survey prioritize the environment over the economic growth in China, the United States and Germany, but there are differences in proportion between the different categorical variables. The proportion tending towards the environment is higher among young people and students compared to full-time workers, and middle-income earners. Despite the answer had a dichotomous format, there were people providing other answer, which indicates that individuals may hold a wide range of perspectives and concerns that go beyond the dichotomy of environment versus economic growth. One possibility could be that they consider both objectives complementary so that their vision is towards sustainable development (explained in the literature review).

In the upcoming section, we will develop a regression model to assess whether these results are statistically significant. For this, it has been pertinent to exclude the responses belonging to “other answers” and just focus on either protecting the environment or economic growth. This empirical analysis will provide further insights into the factors that may impact individuals' perspectives on the environment and economic growth, and shed light on any significant associations that may exist.

5. INDIVIDUAL ANALYSIS: LOGISTIC REGRESSION

5.1 Description of the sample

This section will first analyse if there are significant differences in responses between China, the United States and Germany and then a regression for each country to identify which characteristics influence significantly in responding protecting the environment or economic growth. To do so, we will employ binary logit models using the Gretl program using data from the seventh wave of World Values Survey: 2017-2022. The data set is limited to the answers of either prioritizing the environment or economic growth, which comprises a total of 6,251 answers, corresponding 2,664 to China, 2,245 to the USA and 1,342 to Germany.

Given that the dependent variable takes value 1 or 0, the aim is to explain the probability of choosing to protect the environment or economic growth, according to different sociodemographic and employment characteristics. In order to capture the probability distribution of the dependent variable, it is necessary to use a model that lacks linearity in its parameters. Therefore, we have chosen to use a binary logistic regression for the elaboration of four models, where the dependent variable is the same for the four of them. The dependent variable takes the following format:

- 1 if individuals choose the answer: *A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs.*
- 0 if they choose the answer: *B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.*

Before analysing which characteristics influence the probability of choosing to protect the environment in each of the three countries, a first model has been made to examine whether there are significant differences in the responses from China and USA relative to those from Germany. Precisely, this model tests whether citizens of China and the United States are either more or less inclined than people in Germany to choose environmental protection over economic growth. Since Germany is the reference country, it has been necessary to elaborate two dummies' variables:

- China: 1 if the answers correspond to individuals from China, 0 otherwise.

- USA: 1 if the answers correspond to individuals from the United States, 0 otherwise.

This far, the first model has been described, and now we will proceed to present the independent variables for the models corresponding to each country. The model for each country aims to assess how each of the independent variables affects the probability of choosing to protect the environment or economic growth. To do so, the variables used will be the same presented previously. Figure 7 describes how they are recodified for the elaboration of the binary logit models.

As presented in Table 2, it was necessary to create dummy variables for place of residence and for each possible employment status except for full-time. The elaboration of these dummies enables a more nuanced analysis of the data and testing the effect of occupational status on the likelihood of choosing to prioritize environmental protection over economic growth. Dummy variables for unemployed, retired, student, part-time, self-employed and housewife were created to compare the probability of choosing to prioritize the environment or otherwise in these occupational statuses, relative to a person with a full-time job. Finally, no modifications were made to the variables of age, educational level, and income level since they were considered directly measurable and were included in their original form in the model.

Table 2. Independent variables for the models of China, USA and Germany

Variable	Categorization
Protecting environment or economic growth	Binary variable: - 1 if top priority is protecting the environment. - 0 if top priority is economic growth
Place of residence (Urban or rural)	Binary variable: - 1 if he/she lives in an urban area. - 0 if he/she lives in a rural area.
Age	1.- 16-24 years 2.- 25-34 years 3.- 35-44 years 4.- 45-54 years 5.- 55-64 years 6.- 65 years and over
Education level	1.- Lower 2.- Middle 3.- Higher
Employment status	Binary variable for Unemployed, Retired/pensioned, Student, Part-time, Self-employed, Housewife: - 1 if he/she belong to that job occupation 0 otherwise
Income level	1.- Low 2.- Medium 3.- High

Source: Own elaboration with the data obtained from WVS.

5.2 Results of the regressions

The results of the first model, which predict the probability of selecting to prioritize the environment in China and USA, relative to Germany. According to the results reflected in Table 3, the constant has a positive and significant coefficient at level 1% (0.824690) indicating that when China and USA variables take zero value, the probability of choosing to protect the environment over economic growth is positive in Germany. The dummy variable for China has a positive and significant coefficient, which indicates that a Chinese citizen is more likely to choose to protect the environment than a German citizen. In contrast, the coefficient of the USA dummy variable takes a negative value at 1% of significance, indicating that it has decreased the likelihood of an American citizen choosing to protect the environment over economic growth in comparison to a German citizen.

Table 3. Results Model 1.

Regressor	Coefficient
Const	0.824690*** [0.0593026]
China	0.149611** [0.0735100]
United States	−0.450680*** [0.0732228]

Note: In this table, the dependent variable is the responses for question 111 in the WVS. Standard of errors are in parenthesis and the statistical significance is indicated by *p < 0.1, ** p < 0.05, *** p < 0.01.

In summary, the responses of China and the United States are significantly different from those of Germany in terms of the probability of choosing to protect the environment over economic growth, with China having a positive effect and the United States having a negative effect.

Once the differences between countries are shown, let's examine the differences between individuals from each country. Table 4 summarizes the results of the three models for the three countries. The results obtained indicate certain differences that will be analysed below in relation to the influence of the categorical variables for each individual in each country. For a clearer interpretation of the results, it has been considered convenient to examine country by country the characteristics that significantly influence each individuals' probability of choosing to protect the environment over economic growth.

Table 4. Summary of the results of the models for each country.

Regressor	China (n=2,664) coefficient	Germany(n=1,342) coefficient	USA (n=2,245) coefficient
const	0.333048 [0.247070]	0.364540 [0.418329]	−0.213040 [0.295908]
Urban_rural	0.0801921 [0.0973502]	0.221603 [0.190663]	0.111124 [0.137375]
Age	0.00489144 [0.0385707]	−0.119951** [0.0607246]	−0.103793*** [0.0344609]
Education_level	0.257286*** [0.0681084]	0.518166*** [0.100270]	0.483034*** [0.0849376]
Unemployed	0.105633 [0.220094]	−0.474360* [0.285390]	−0.0737593 [0.172603]
Retired/pensioned	0.262087 [0.168072]	−0.0395074 [0.206749]	−0.271624* [0.154915]
Student	0.0787445 [0.234406]	0.0204117 [0.316767]	1.33784** [0.624512]
Part-time	−0.0448698 [0.193653]	0.0661558 [0.211690]	0.205230 [0.150626]
Self-employed	−0.262698* [0.152148]	0.767004* [0.404234]	0.439587** [0.215681]
Housewife	−0.369847*** [0.134915]	0.00193957 [0.338487]	−0.0782564 [0.174969]
Income_level	0.116534 [0.0855243]	−0.202643 [0.136731]	−0.191622** [0.0867675]

Note: In this table, the dependant variable is the responses for question 111 in the WVS. Standard of errors are in parenthesis and the statistical significance is indicated by * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

China

Focusing on China, the level of education, being self-employed, and being a housewife have been found to have a significant effect in the probability of choosing protecting the environment over economic growth. The level of education is positively and significantly associated at the 0.01 level with the likelihood of prioritizing the protection of the environment over economic growth, indicating that higher-educated Chinese individuals are more likely to prioritize the environment even if it means a slowdown in the country's economy (as stated in the survey's answer).

Alternatively, being a housewife has a negative and significant influence on the probability of choosing to protect the environment, meaning that the probability of a housewife choosing to protect the environment is lower than that of a full-time employee. Being self-employed also has a negative and significant effect on the

probability of choosing the environment but at the 0.1 level. None of the other employment variables or income levels are significant for Chinese individuals.

The remaining occupation statuses are not statistically significant and the same is observed for the income level and the age groups in China. Therefore, these variables may be considered not relevant for predicting the probability of prioritizing protecting the environment versus economic growth for Chinese citizens.

Germany

In the case of Germans, the variables found to be significant were age, educational level, being unemployed and self-employed. The age variable in Germany has a negative and significant coefficient at 5%, indicating that the older the Germans are, the more likely they are to prioritize economic growth over protecting the environment.

The level of education takes a positive and significant coefficient at 1%, as in China, indicating that the higher the level of education of individuals, the more likely they are to protect the environment. With respect to employment, the unemployed, with a negative coefficient at 10% significance, indicates that an unemployed German is less likely to choose to protect the environment than a full-time worker. In contrast, the coefficient of self-employed at a 0.1 level of significance takes a positive value so that being self-employed in Germany positively affects the probability of choosing an environment with respect to full-time workers. Precisely, the contrary to China which indicates the differences across countries in economic and social terms.

United States

Referring to the United States, age, educational level, retired/pensioned, student, self-employed, and income level were found to be significant factors. Regarding the age, the coefficient takes a negative value and is significant at 1%, so the interpretation is the same as for Germany: the older the Americans are, the less likely they are to prioritize the environment over the economic growth. The level of education is again as in the previous cases positive and significant at the 1% level.

In the case of retired and/or pensioned individuals, the coefficient of this variable takes a negative value, which is translated as that the probability of prioritizing the environment decreases for retired Americans compared to full-time workers. The coefficients of the student and self-employed variables take a positive value and are significant at 95%, so the interpretation to be drawn is the same for both cases. Being a

student or self-employed in Germany increases the probability of choosing the environment over economic growth, relative to full time workers.

As for the wage level, which is only significant in the USA, the coefficient takes a negative and significant value, which means that as the income of Americans increases, they are less likely to prioritize the environment over economic growth. Although in China and Germany income level results are not to be significant in this model, the p-value (0.1730 and 0.1383) are relatively close to being significant at 10% so, it is a factor that could still be object to analyse. Indeed, it is a factor that complements others such as in the access of education and information, which in turn affects environmental concern.

5.3 Discussion of the results

According to the binary logit model, education level seems to play a key role in China, United States and Germany when choosing between economic growth and environment. The statistically significant, positive effect of education level in the three countries (see Table 4), indicates that individuals with higher levels of education are more likely to prioritize environmental protection over economic growth in the three countries. This can be translated into the fact that education provides people with greater knowledge and understanding of environmental problems and their possible solutions. Moreover, education can also increase the sensitivity of individuals and thus make them more willing to participate in actions towards protecting the environment (EPA, 2022).

Although education resulted significantly positive in the three countries, it is remarkable that being a student only resulted positively significant in the USA when prioritizing protecting the environment over economic growth, suggesting the differences in education in terms of their emphasis on environmental education and sustainability between the three countries.

Another aspect that has resulted significant in the three countries has been being self-employed versus being employed full time, but in different dimensions. In China being self-employed negatively influences the likelihood of prioritizing the environment while in Germany and the USA it affects positively. This illustrates the fact that the nature of employment and the business culture in each country may significantly influence people's attitudes towards environmental protection and sustainable economic development.

The fact that Chinese self-employed people are less likely to prioritize protecting the environment over full-time employees, may be related to the country's rapid economic growth over the past decades and the population's desire to stay out of poverty while also promoting job creation (Dfid, 2008). China's economic growth may also account for the negative and significant impact of being a housewife on environmental prioritization since they may be more concerned with meeting the immediate needs of their families and leave the environment as a secondary concern. In fact, it is highly probable that their economic situation is unstable, since they are financially dependent on the father of the family, so their concerns will be mainly related to economic aspects.

Continuing with factors that affect negatively to the likelihood of responding, protecting the environment as a top priority is age in China and Germany. This could be interpreted to imply that the country's older generations may have personally experienced the benefits of economic growth and therefore prioritize it over environmental protection. Hence, younger generations are more likely to make the environmental protection a top priority over economic growth.

Being unemployed and retired also decreases the probability of prioritizing the environment in United States and Germany respectively. These groups can be expected to have economic growth as a priority since they are much more dependent on economic policies, pension plans and job creation. Yet, high-income earners in the U.S. are also more likely to prioritize economic growth, which may be because they want to maintain their economic status. It is also noteworthy that the attitudes of German and U.S. citizens are more similar and the differences between China and the other two countries are striking.

Surprisingly, place of residence, differentiated between urban or rural, resulted not to be significant for any of the countries analysed. At first glance it can be assumed that people who live in cities and more exposed to the negative consequences of environmental change are thereby more likely to prioritize the environment. However, the regression model indicates that at least in the countries analysed is far from being significant. One of the reasons for this could be related to imbalances in the sample size since there are too many responses for people living in urban areas than for those living in rural areas (see table 2). Hence, this can lead to biased results and make it difficult to detect any possible significant difference between those two groups.

6. CONCLUSION AND LIMITATIONS

To foment an environmentally conscious society, it is crucial to identify the factors that influence the prioritization of environmental protection versus economic growth. Specifically, it is important to understand which conditions have a positive impact on the probability of prioritizing environmental protection over economic growth. The World Values Survey wave 2017-2022 has provided an aggregate and individual view of people's perceptions under the scenario of having to choose between protecting the environment and economic growth.

The first objective was to identify what people prioritized at the global and country level. The aggregate results show that people are more likely to choose prioritize the environment as their top priority, and then this proportions are related to with the economic or environmental situation of each country.For the economic aspect the GDP pc PPP (in US$) was used and for the environmental aspect the 2022 EPI and in neither case was a clear relationship found.

Next, the database was narrowed down to investigate further what affects the perceptions of individuals when choosing between environment and economic growth. China, the USA, and Germany are widely recognized as major players in the global economy, and their impact on the environment is significant. By focusing on these three countries, which have distinct cultural, social, economic, and political characteristics, we can gain a relatively comprehensive perspective on what may influence to prioritize environmental protection over economic growth.

All three countries have a percentage greater than 50% towards protecting the environment, with China having the highest percentage (68.9%). The responses have been cross-checked with age, place of residence, education level, employment and income level to examine how they affect the response to one or the other. Descriptively, it is observed that for all groups the environment is prioritized, but in different proportions, highlighting the higher proportion for students relative to full time workers and young people.

In terms of statistical analysis, the first model indicates significant differences between the three countries when it comes to prioritizing the environment. The country-by-country models then reaffirm this in that different factors significantly affect the likelihood of choosing environmental protection over economic growth for each individual.

Binary logit regressions by country have revealed that the three countries coincide in the fact that the higher the education, the more likely that the environment is a priority for individuals. In terms of employment, being self-employed has a positive and significant effect in Germans and Americans, but for Chinese citizens it has a negative effect. Germany and the United States also agree that age has a negative effect on prioritizing the environment but in China it is not significant.

In China, being a housewife has a negative effect on prioritizing the environment whereas in the USA, having a high level of income has a negative effect.

We have seen differences in which characteristics affect significantly in each country so it is crucial to implement policies and regulations that are adapted to the current society of that country to sensitize the population.

While this paper presents various insights on the topic at hand, it is important to acknowledge its limitations and areas for further research. Until the binary logistic regression was elaborated, it was necessary to consider "other responses" because it is limited to the lack of information on the assumptions, attitudes and behaviours of the respondents. These "other answers" could encompass a multitude of factors, including social equity, health, cultural values, sustainability, and more when forming their stance on this matter. In fact, it indicates that individuals may hold a wide range of perspectives and concerns that go beyond the dichotomy of environment versus economic growth. The variables chosen for the binary regression are considered to greatly impact the lives and attitudes of all individuals, regardless of the country, albeit with the awareness that other variables, such as culture, ideology, and politics, among others, could have been considered.

Moreover, it would be relevant to further research about how people understand the concepts of economic growth, environmental protection, and sustainable development. Although it can be assumed that they are common knowledge due to their constant mention in all mass media, it is not within our reach to know what people understand by these concepts.

For policies and regulations to be effective, it is not only a matter of focusing on people who have a pro-environmental interest, but also of approaching young people, promoting decent and quality education, and therefore good jobs so that they take environmental challenges as a priority.

Although in the literature review, we have seen that public organizations and institutions defend the development of both simultaneously, we find it interesting to

analyse what people prioritize in the case of having to choose. In the short term, it will probably first be necessary to modify habits or slow down the pace of consumption and activities in our daily routines to contribute to a more sustainable society. For sustainable transition to be effective, it is not only a matter of focusing on people who have a pro-environmental interest, but also of approaching young people, promoting decent and quality education, and therefore good jobs so that they take environmental challenges as a priority.

7. BIBLIOGRAPHY

Anderson, K. (2015). Duality in climate science. *Nature Geoscience, 8(12)*, 898-900.

Aşıcı, A. A. (2013). *Economic growth and its impact on environment: A panel data analysis.* Ecological indicators.

Atwi, M., Barberán, R., Mur, J., & Angulo, A. (2018). CO2 Kuznets Curve Revisited: From Cross-Sections to Panel Data Models. *Journal of Regional Research*, 169-196.

Bardi, U. (2011). The limits to growth revisited. Springer Science & Business Media.

Callen, T. (2008). What is gross domestic product. *Finance & Development, 45(4)*, 48-49.

Callen, T. (2017). Purchasing Power Parity: Weights Matter. *Finance & Development: Back to Basics*, 44-45.

Cohen, S. (2020). Economic Growth and Environmental Sustainability. *Columbia Climate School*. Retrieved from https://news.climate.columbia.edu/2020/01/27/economic-growth-environmental-sustainability/

Costanza, R., Kubiszewski, I., Giovannini, E., Lovins, H., McGlade, J., & Pickett, K. E. (2014). Development: Time to leave GDP behind. *Nature, 505(7483)*, 283-285.

Daniel.C, E., & Michael E, P. (2005, August). National environmental performance: an empirical analysis of policy results and determinants. *Environment and Development Economics*, 391-434.

Demaria, F. (2018, April). *SDG Watch Europe*. Retrieved from Economic growth is not compatible with environmental sustainability: https://sdgwatcheurope.org/economic-growth-is-not-compatible-with-environmental-sustainability/

Dfid, G. B. (2008). Growth: building jobs and prosperity in developing countries. . *London: Department for International Development.*

Drews, S., Antal, M., & van den Bergh, J. C. (2018). Challenges in Assessing Public Opinion on Economic Growth Versus Environment: Considering European and US Data. *Ecological Economics*, 265-272.

Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. In Nations and households in economic growth. *Academic press*, 89-125.

Ehrhardt-Martinez, K., M. Crenshaw, E., & Jenkins, J. C. (2002). Deforestation and the Environmental Kuznets Curve: A Cross-National Investigation of Intervening Mechanisms. *Social Science Quarterly*, 226-243.

Emerick, D. (2023). *The Environmental Performance Index: How it Works.* . Retrieved from ESG The Report : https://www.esgthereport.com/the-environmental-performance-index-how-it-works/

EPA. (2022, July 28). *What is Environmental Education?* . Retrieved from US EPA: https://www.epa.gov/education/what-environmental-education

European Comission. (2020). *Attitudes of Europeans towards the Environment.*

Gardner, T. (2004). Limits to Growth? – A Perspective on the Perpetual.

Grossman, G. a. (1991). Environmental Impacts of a North American Free Trade Agreement . *National Bureau of Economic Research, Cambridge.*(No. w3914).

Grossman, G. M., & Krueger, A. B. (1995). Economic Growth and the Environment. *The Quarterly Journal of Economics*, 353-377.

Haerpfer, C., Inglehart, R., Moreno, A., Welzel, C., Kizilova, K., J., D.-M., . . . Puranen, B. (2020). *World Values Survey: Round Seven – CountryPooled Datafile.* Madrid, Spain & Vienna, Austria: JD Systems Institute & WVSA Secretariat. Retrieved from https://www.worldvaluessurvey.org/WVSDocumentationWV7.jsp

Krueger, & Grossman. (1991). Economic growth and its impact on environment: A panel data analysis. *Ecological Indicators*, 324-333.

Krugman, P. (2023, February 23). Wonking Out: Why Growth Can Be Green. *New York Times*.

Leggett, J. (2010, January 23). *The Guardian*. Retrieved from Prosperity Without Growth: Economics for a Finite Planet by Tim Jackson: https://www.theguardian.com/books/2010/jan/23/properity-without-growth-tim-jackson

Lequiller, F., & Blades, D. (2009). Understanding National Accounts: Second Edition. *OECD Publishing*, 15-17.

Liu, J., & Raven, P. (2010). China's Environmental Challenges and Implications for the World. *Critical Reviews in Environmental Science and Technology, 40,*, 823-851.

Mazzanti, M., & Zoboli, R. (2009). Municipal Waste Kuznets Curves Evidence on Socio-Economic Drivers and Policy Effectiveness from the EU. *Environment Resource Economics*, 203-230.

Meadows, D., Meadows, D., & Randers, J. (1992). *Beyond the Limits: Global Collapse or a Sustainable Future.* London: Earthscan Publications Ltd.

Meadows, D., Meadows, D., Randers, J., & Behrens III, W. W. (1972). *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind.* New York: Universe Books.

Meadows, D., Randers, J., & Meadows, J. (2004). *Limits to Growth: The 30-Year Update* . London: Earthscan .

Mishan, E. J. (1967). The costs of economic growth. *London: Staples Press*, 112.

OECD. (2009). Integrating Climate Change Adaptation into Development Co-operation. *OECD*.

OECD. (2011). Green Growth: Towards a Sustainable Future.

OECD. (2015). *OECD*. Retrieved from Economic growth can complement environmental conservation: https://www.oecd.org/greengrowth/economic-growth-can-complement-environmental-conservation.htm

Perman, R., Ma, Y., McGilvray, J., & Common, M. (2003). *Natural resource and environmental economics* (Third ed.). Pearson Education.

Pew Research Center. (2021). *In Response to Climate Change, Citizens in Advanced Economies Are Willing To Alter How They Live and Work* .

Roser, M. (2013). *Economic Growth*. Retrieved from OurWorldInData.org: https://ourworldindata.org/economic-growth'

Schneider, F., Kallis, G., & Martinez-Alier, J. (2010). Schneider, F., Kallis, G., & Martinez-Alier, J. (2010). Crisis or opportunity? Economic degrowth for social equity and ecological sustainability. Introduction to this special issue. *Journal of cleaner production, 18(6)*, 511-518.

Schreyer, P., & Koechlin, F. (2002). *Purchasing power parities – measurement and uses* . OECD.

Shahbaz, M., & Sinha, A. (2019). Environmental Kuznets curve for CO2 emissions: a literature survey. *Journal of Economic Studies*, 106-168.

The Nature Conservancy . (2018). *The Science Sustainability: Exploring a unified path for development and conservation.* Frontiers in Ecology and the Environment.

Turner, G. (2008). A Comparison of The Limits to Growth with 30 Years of Reality. . *Global Environmental Change*, 397-411.

United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. *United Nations: New York, NY, USA*.

United Nations. (2020). *The Sustainable Development Goals Report 2020.* New York : United Nations Publications.

United Nations. (n.d.). *United Nations*. Retrieved from United Nations Statistics Division: https://unstats.un.org/unsd/environmentgl/gesform.asp?getitem=470

Van den Bergh, J. K. (2012). Growth, a-growth or degrowth to stay within planetary boundaries. *Journal of Economic Issues*, 909-920.

Victor, P. (2010). Questioning economic growth. *Nature, 468(7322)*, 370-371.

WCED. (1987). Our common future—Call for action. *Environmental conservation, 14(4)*.

Wolf, M. J. (2022). 2022 Environmental Performance Index.

World Values Survey. (n.d.). *Online Data Analysis*. Retrieved from World Values Survey: https://www.worldvaluessurvey.org/WVSOnline.jsp