Review of Economics and Political Science

How do cultural values affect economic growth? An empirical evidence from world values survey (1994–2021)

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Received 1 February 2023
Revised 28 November 2023
14 March 2024
18 May 2024
Accepted 9 July 2024

Abstract

Purpose – This study utilizes cultural values from the World Values Survey (WVS) to investigate the cultural hypothesis regarding economic growth. Following Granato *et al.*'s (1996) theory, this paper describes a systematic method for developing analytical models that clarify the effect of cultural values on economic growth by using seemingly unrelated regression (SUR).

Design/methodology/approach – The results are sustained through regression analysis using ordinary least squares (OLS) and SUR. The sample size covers all WVS countries from the third wave in 1994 to the seventh wave in 2021, due to the limited sample size in the first and second surveys, which is insufficient for estimation.

Findings – Results highlight culture as a crucial factor for economic growth. Although the study found a positive effect of autonomy, life satisfaction, and post-materialism on economic growth, trust has been found to have a negative impact.

Originality/value – Although the literature has theoretically proven the impact of cultural values on economic growth, there is a significant disparity in the empirical studies, owing to a lack of applied studies. This study deepens the cultural analysis compared to earlier empirical investigations. To the best of the authors' knowledge, this is the first attempt to assess the combined effect of the selected four cultural values on economic growth during 1994 and 2021. Furthermore, SUR analysis allows for the estimation of the variables' effects throughout the five waves.

Keywords Cultural values, Autonomy, Post-materialism, Satisfaction, Trust, World values survey

Paper type Research paper

1. Introduction

The concept of economic growth is becoming increasingly multifaceted. This resulted in the model's amplification and, as a consequence, the possibility of investigating the impact of cultural values on economic growth. Values and beliefs serve a significant role in shaping human behavior and have a considerable impact on economic growth. According to Piketty (2014), there is no method to explain the distinctive characteristics of each economy outside of its social perspectives, such as political, moral, and cultural. Moreover, the impact of cultural

Review of Economics and Political Science
Emerald Publishing Limited
e-ISSN: 2631-3561
p-ISSN: 2356-9980
DOI 10.1108/REPS-02-2023-0012

values on economic growth should be quantified to enhance their importance in development policies. This requires establishing indicators of cultural values and measuring their impact on economic growth.

Cultural values enhance economic growth in two aspects. The first is a tool or resource that can be used directly in the context of economic growth (i.e. culture as a factor that directly contributes to increasing GDP). This aspect refers to the direct components of the culture of a country or region that may be valued for economic purposes. The second is the environmental component that stimulates and enhances efforts toward development. This case concerns indirect (i.e. social, moral) characteristics that may stimulate or hinder economic growth. Many studies have supported that economic growth in many countries, such as the Asian tiger countries, is due to cultural factors (Sen, 2004; Khan *et al.*, 2010).

This paper surveys the significant contributions to the rapidly growing empirical literature on cultural values and economic performance, focusing primarily on the cross-country approach. The study uses cultural values in the economic growth model, following the methodology proposed by Granato *et al.* (1996) (GIL) (see Appendix 1). In particular, the cultural and control variables would be put into one model to measure the impact of cultural values on economic growth during successive waves of the WVS from 1994 to 2021.

To contribute to filling the literature gap, this study provides analytical and applied frameworks for understanding the impact of cultural values on economic growth. The dearth of a quantitative analytical framework has impeded policymakers' ability to incorporate this critical element into their decision-making processes. This study aims to explain the relationship between cultural values and economic growth quantitatively and dynamically through (1) Utilizing updated indicators to measure cultural values using the data of the WVS. While the GIL model utilized "achievement motivation" (autonomy) and "post-materialism". In this study, to get an accurate comprehension of the measures of cultural values affecting economic growth, the values were expanded to include "trust" and "life satisfaction," which have been considered two of the most important cultural values affecting economic growth according to the literature. (2) Including all countries covered by every wave to expand the sample size. (3) Using ordinary least squares (OLS) estimates for every period. In addition, the study uses the SUR estimation, which is a flexible form of Random Effects (RE) and is widely used in cross-country regressions since it allows for the error terms to be correlated across periods (Alesina and Ferrara, 2005).

In addition to this introduction, the paper has four sections. Section 2 presents a literature review of the relationship between cultural values and economic growth. Section 3 details the model specification, the data, and the econometric methodology utilized. Section 4 presents the empirical results. Section 5 concludes by incorporating relevant policy implications. Finally, Section 6 highlights limitations and future research.

2. Cultural values and economic growth: literature review

This section discusses the theoretical relationship between cultural values and economic growth, and it also reviews empirical studies.

2.1 Theoretical linkage between cultural values and economic growth

Adam Smith (1759) was the first to analyze the impact of norms, morals, and culture on economic growth in his theory of moral sentiments (Bonar, 1926). Linkages between economic growth and cultural values were directly observed by Weber (1905) when he claimed that certain "ethics" contribute to increased economic growth, like the accumulation of wealth and

investment (Weber, 1905). Since Weber's time, researchers have attributed disparities in national economic development to the existence or absence of certain cultural values (McClelland, 1965). Many researchers who focus on the importance of the role of culture believe that they are the heirs of Weber, which they call the Neo-Weber school (Swedberg, 1998; Holton and Turner, 1989; Mann, 1986).

The breadth of the definition of cultural values varies from researcher to researcher. On the theoretical side, some of the most prominent scholars in the field draw attention to the vague concept of culture: according to Tabellini (2008), culture is a "black box". He interpreted culture in two ways. The most common meaning of culture is that it refers to social norms and individual beliefs that maintain equilibrium as focal points in recurring social interactions. An alternative interpretation is that culture relates to things more primitive, such as individual values and preferences. Fernandez and Fogli (2009) used the definition from Webster's Dictionary (2002), which is that culture is (a) "the integrated pattern of human knowledge, beliefs, and behavior that depends on the human ability to learn and pass on knowledge to future generations"; (b) "customary beliefs, social forms, and physical features of an ethnic, religious or social group".

On the other hand, Nunn (2012) defined culture as "decision-making inference or 'general rules' that developed due to the need to make decisions in complex and uncertain environments. These decision-making styles usually express themselves in values, beliefs, or social norms". Exact definitions of culture construction can differ between researchers, as all definitions have two central components. First, the definitions are based on values and beliefs. Second, the definitions focus on groups of people. Thus, it becomes crucial to identify the categories of values and beliefs and the group that shares them.

Myrdal (1968) was one of the most influential thinkers who linked the prevailing cultural values in the country to economic development. In his book on the countries of South and Southeast Asia, he believed that unless there is a change in the culture of those countries, the chances of economic growth are slim. Harrison (1985) also linked cultural and social variables with economic development in Latin American countries and showed that culture was a significant obstacle to development in most Latin American countries. Huntington (2000) also emphasized the importance of culture as a critical factor for economic development and the clash between human groups.

Despite the importance of these cultural theories, there is reason to be very careful in their application in explaining the economic growth of any country or region. Sen (2004) doubted the original argument formulated to explain the economic growth of Catholic European countries followed by Japan, then by the Asian Tigers, and more recently, by countries such as Malaysia, Indonesia, China, and India. Likewise, Weiss and Hobson (1995) argued that the same ethics to which cultural theories attribute the success of East Asian countries have also been associated for centuries with stagnant economies.

2.2 Review of the empirical literature

The first systematic study of cultural values was published by GIL in 1996. They used OLS for data from 25 countries from the second wave (1990–1993). Cultural values were incorporated into the endogenous economic growth model. The study focused only on two cultural values, namely "post-materialism" and "achievement motivation". The study concluded that while "achievement motivation" positively impacts economic growth, "post-materialism" harms economic growth.

The study of GIL has become the subject of controversial discussion. Jackman and Miller (1996) described the GIL's systemic procedures as "fatal flaws", as "achievement motivation" was measured at the end of the period, and economic growth was measured at the beginning.

In addition, Swank (1996) showed the need to pay greater attention to the role of institutions in promoting cultural values.

Over time, new data became available, allowing for a more comprehensive examination of the GIL model. Hanson (2009) re-estimated the GIL model using the same variables. His study aimed to test the GIL model in two main ways. First, it tested whether cultural variables measured during the 1990 wave were predictive of economic growth in the following period. Second, he expanded the sample of countries from 25 to 42 countries. Hanson's study found that the "achievement motivation" had no significant effect on economic growth, and this was contrary to what the GIL model concluded.

In several aspects, GIL's approach is expanded upon by Edwards and Patterson (2009). Initially, they re-estimated the same model for several periods and country samples. Their findings don't support GIL's findings. The fundamental concept of culture has evolved, which could be their explanation for the uneven influence of culture across samples and time. They discovered that "achievement motivation" is a substantial explanator of long-term economic growth, while post-materialism is not. In summary, their findings indicate that the relationships between culture and growth are not as evident as GIL discovered.

Several empirical studies indicate that culture plays a vital role in economic growth. Tabellini and Harari (2009) found a strong relationship between cultural values and economic development using data across European regions. Van Hoorn (2019) used an approach to test possible cultural values relevant to individuals' propensity towards human capital accumulation. Results indicate a strong relationship between culture and human capital accumulation.

According to Khan *et al.* (2010), the cultural approach to estimating economic growth succeeded in explaining the economic growth of the Asian tigers, which is known as the economic miracle. They estimated the impact of specific cultural values on the economic growth of selected Asian countries (i.e. 11 countries). They found evidence that cultural attitudes toward trust, respect, and self-determination positively impact economic growth. However, cultural attitudes toward obedience were found to be negatively associated with economic growth.

Recently, some empirical studies have investigated the impact of cultural values on specific activities such as investment (Ahunov and Van Hove, 2020; Aren and Nayman, 2021) and tax avoidance (Kanagaretnam *et al.*, 2018; Toumi *et al.*, 2022; Yoo and Ye, 2019). A study by Frijns *et al.* (2022) also linked national cultural differences to corporate risk-taking. Deirmentzoglou *et al.* (2024) likewise explored the impact of cultural values on perceptions of corporate sustainable development (CSD) in three dimensions (economic, social, and environmental).

Some studies have opposed the existence of a relationship between cultural values and macroeconomic variables in general and economic growth in particular. One of the most important of these studies is the study of Pryor (2005), which also used data from the WVS. He demonstrated that the strength of values associated with market success had no discernible effect on economic growth in a sample of developing and developed market economies. He also demonstrated that such values do not appear to be tied to the economic system and have a hazy relationship to the overall level of economic progress.

2.3 Review of the literature on cultural values indices

Cultural values included in our analysis, are "autonomy", "post-materialism", "trust", and "satisfaction". These factors lead to interaction between individuals, the market, and entrepreneurship.

Inglehart (1991) concluded that autonomy and determination are among the values that positively impact economic growth, while obedience and religious faith negatively affect

economic growth. If children are taught undesirable obedience, their control and autonomy will be lower. As a result, children are less likely to indulge in risky activities to take the crucial initiative (Harper, 2003). According to Platteau (2000), obedience differs from respect in that a greater level of respect leads to greater tolerance of others in society. With a higher tolerance level comes a more accepting attitude toward expanding the market and raising economic growth and development. As Coyne and Williamson (2009) have argued, "In societies with lower levels of social capital, and therefore lower levels of respect, the extent of the market will be limited to networks." In line with these arguments, higher levels of respect are likely to increase economic growth.

Some societies view obedience as destructive (Tabellini, 2008), because of the adverse effect of a high level of obedience on an individual's autonomy and risk-taking. Previous literature has argued that a high level of obedience negatively impacts economic growth and development. In general, autonomy and determination encourage and support economic growth, while obedience and religious faith reduce the prospects for economic growth. Along the same lines, Ek (2024) examined which country features most closely relate to human capital, and cultural values were the only reliable predictor. So, he found individuals who place a high value on autonomy have a comparative advantage in positions where autonomy is limited.

The second index used in our study is "post-materialism", which measures the response of individuals in the WVS to the extent to which priority is given to material or post-material goals for the country (Granato *et al.*, 1996; Hanson, 2009). According to Kafka and Kostis (2021), post-materialism was the opposite of traditional values. Their analysis was based on a sample of 34 member countries of the Organization of Economic Cooperation and Development (OECD). Through their empirical analysis, they proved the prevalence of traditional/materialistic values for the period 1981–1998 and post-materialistic values for the period 1999–2019, which shows the cultural backlash that has occurred in the economies under consideration over the last 40 years. However, the analysis also found a positive effect of cultural background on economic growth.

Despite Jordaan's (2023) study, post-materialism has a negative direct growth effect. Additionally, he found that post-materialism has a positive indirect impact that leads to economic growth through economic freedom. These results suggest that the institutional structure supporting economic freedom is influenced by post-materialism and that economic freedom serves as a conduit for the economic consequences of social values.

The third index used in our study is "life satisfaction". Easterlin and Angelescu (2009) measured the effect of happiness, represented by the level of life satisfaction, on economic growth in the long and short terms in their income and happiness paradox. The study used data from the WVS, including 17 developed countries, 9 developing countries, and 11 emerging countries. The study concluded that there is no relationship between happiness and economic growth in the long term for the three groups of countries or the countries combined. On the other hand, there was a positive relationship in the short term.

Pfaff and Hirata (2013) tested Easterlin's hypothesis at the country level, where individual panel data allow for the exploitation of significant methodological advantages. Using long-term panel data for Germany and the United Kingdom, they did not find robust evidence for a relationship between GDP per capita and life satisfaction in either country.

Similarly, Bellinger *et al.* (2024) developed a model based on data from six waves of the WVS that stated that a person's life satisfaction is dependent on three factors: (1) personal situations; (2) national factors involving democratic governance, and national wealth; and (3) the explicit interactions of these two factors of analysis. The empirical evidence demonstrated that national wealth and democracy both diminish the impact of personal income on life satisfaction.

On the other hand, Rudolf and Bethmann (2023) investigated the relationship between economic development and adolescent satisfaction. The results indicated a negative log-linear relationship between GDPP and adolescent life satisfaction. The negative nexus stands in stark contrast to the otherwise positive relationship found between GDPP and adult life satisfaction in the same countries.

Finally, the fourth index used in our analysis is "trust". Knack (1999) states that high-trust societies achieve faster growth rates due to lower transaction costs. The type of trust that enhances growth is "generalized trust" defined as trust between strangers. Also, Uslaner (2002) argues that generalized trust lowers transaction costs and leads to increased tolerance among different people and a heightened willingness to trade—both factors leading to faster economic growth. From another perspective, trust leads to higher institutional quality, particularly to lower corruption (Uslaner, 2008). According to Kong *et al.* (2023), trust is crucial in constraining market behavior. As a result, personal trust is a vital factor that policymakers might consider when establishing rules based on informal institutions to punish market participants.

Contrary to previous studies, many studies have argued the difference between trust and trustworthiness. Johnson and Mislin (2011), argued that although individual trust may provide insight into trust across countries, it needs to be clarified whether it is a valid measure of general trust behavior. Banerjee (2016) and Glaeser *et al.* (2000) linked the question of trust in general in WVS and experimental studies of trust within countries. These studies concluded that trust in WVS and the concept of trustworthiness were not correlated.

Rahimi *et al.* (2022) used the WVS's trust index, to investigate the relationship between trust and innovation with economic growth in two selected groups of developed and developing countries. They used the two-stage Generalized Method of Moments (GMM) model. According to the results, the trust index in the selected developed countries has a positive and significant effect on economic growth, but in the selected developing countries a significant level of 90% hurts economic growth.

Roth (2024) investigated the intertemporal variation of trust and economic growth. Using the Integrated Value Study [IVS], we created a unique global nation panel dataset and used a system-generalized method of moments (SYSGMM) estimate strategy on a sample of 75 market economies over 40 years (1980–2019). Roth's study showed evidence for a causal curvilinear (inverted U-shaped) relationship between trust and growth. Furthermore, the study discovered that most economies fall short of the optimal threshold for trust and growth, and it is incumbent on their policymakers to pursue trust-building strategies to attain higher growth.

In the same vein, Borkowski (2024) identified the link between social trust and economic development in selected European nations between 2017 and 2020. The model included 35 European economies and used partial least squares structural equation modeling PLS-SEM model. His study showed that social trust had a strong, positive, and significant influence on economic development. Differences in trust appeared to be a legitimate explanation for significant developmental disparities between European countries. Furthermore, trust in other individuals is more crucial than trust in institutions for fostering social trust. As a result, social trust is classified as a "deep" predictor of growth because of its effects on both growth and its other determinants.

On the other hand, additional studies have related cultural values to one another, such as Booth's (2021) study that found a correlation between post-materialism and life satisfaction. Using WVS data, his study found that persons who engage in fewer post-material experiences have lower life satisfaction than others, particularly post-materialists. Similarly, Delhey (2010) studied whether post-material issues are more important for satisfaction than materialist ones in prosperous post-industrial cultures. Individual autonomy and job inventiveness indicate post-materialist concerns, whereas income indicates materialist

concerns. The study analyzed data from wave 5 of the WVS. Using a multi-level methodology, the result indicated a rather continuous pattern of postmaterialist satisfaction.

2.4 The research gap

The main line of criticism concerning the measurement of cultural values is that it lacks any theoretical framework. According to Beugelsdijk (2006), the major problem regarding the culture literature is the mismatch between the theoretical foundations of culture and its empirical implementation: the conceptualization is at the micro level, referring to micro units such as individuals or firms, but in the empirical studies culture is used as an aggregate macro variable.

Only a few studies have systematically examined the impact of cultural values on economic growth. Kapás (2017) argued that the empirical analysis of the impact of culture on growth is widespread, but three main debatable issues emerge in particular. First of all, the empirical studies lack of clear conceptualization and a well-developed theoretical framework. Second, the measurement of culture can be criticized on many grounds. Third, several difficulties can be associated with the econometrics used in the literature.

It is noteworthy that there are few studies devoted to the dynamic aspect of the interaction between economic growth and cultural values. Studies tend to examine the relationship between values and economic growth statically, and some studies have supported that a change in economic factors will lead to a change in cultural variables.

These debates are beyond the scope of this paper, which addresses the more limited matter of whether cultural values remain a significant predictor of economic growth in more appropriate statistical tests. Therefore, this study will try to fill the gap in terms of the likely effect of cultural values on economic growth by using WVS data on different countries.

3. Data methods, and model specifications

3.1 Methodology and hypotheses

This study uses "trust", "life satisfaction", "post-materialism", and "autonomy" indices to estimate the impact of cultural values on economic growth. To track changes in cultural values and study them dynamically, it is necessary to have more than one wave in successive periods.

In this context, hypotheses are established to support the theory that economic growth is improved when favorable cultural features are more prevalent. This leads to the following hypothesis for measuring cultural values:

The main hypothesis: The presence of certain cultural values in the country has a positive impact on the lives of individuals and thus will lead to higher economic growth in the country.

This hypothesis is tested as four sub-hypotheses, as follows:

H1. On average, a higher "autonomy" emphasized in children's upbringing, will grow the economy faster.

H2. On average, higher "trust" will result in higher economic growth.

H3. On average, a higher level of "satisfaction" leads to higher economic growth.

H4. On average, a higher level of "post-materialism" increases economic growth.

Cultural values reflect the cultural environment obtained from the WVS, including several simple and complex indicators. The mean was used to calculate the variables, assuming congruence between values at the individual and macro levels (Welzel and Inglehart, 2005).

3.2 Model specification

To estimate the relationship between cultural values and economic growth, the following function is used:

$$\mathrm{GDPP} = f\,(\mathrm{autonomy}, \mathrm{Post}-\mathrm{materialism}, \mathrm{Satisfaction}, \mathrm{Trust}, \mathrm{z})$$

To measure the model, the GDPP (Appendix 1) was transformed into a logarithmic variable. Converting the variables to natural logarithms provides effective and consistent results. Consequently, marginal changes in the explanatory variables are interpreted as multiplicative (percentage) changes in the dependent variable. So, the following equation is applied:

$$\mathrm{Log}(\mathrm{GDPP}_{\mathrm{it}}) = \beta_0 + \beta_1\,\mathrm{Autonomy}_{\mathrm{it}} + \beta_2\,\mathrm{Post}-\mathrm{materialism}_{\mathrm{it}} + \beta_3\,\mathrm{Satisfaction}_{\mathrm{it}} + \beta_4\,\mathrm{Trust}_{\mathrm{it}} + \mathrm{z}_{\mathrm{it}} + \varepsilon_{\mathrm{it}} \quad \text{(equation 1)}$$

$$\mathrm{i} = \mathrm{Countries};\ \mathrm{t} = 1, 2, 3, 4, 5\ \mathrm{waves}$$

where log (GDPP) represents the logarithm of GDP per capita; β_0, β_1, β_2, β_3, and β_4 represent the regression coefficients of Equation (1), (i) represents the countries included in each of the five waves, and (t) represents the five waves. Z refers to economic control variables that were added to the model based on previous literature of Levine and Renelt (1992) [1]and Barro and Lee (2013) [2]. In particular, the study relies on the following control variables [3]: the share of FDI to the GDP, the share of trade to the GDP, and the enrollment rate in primary education.

The model is estimated in two steps. The first is to use the OLS to estimate the model in each wave separately (Alesina and Ferrara, 2005). Second, if there is a correlation between the residual, the SUR model is estimated, which gives more efficient estimates than estimating the single equation using the OLS method (Moon and Perron, 2004). The SUR estimates the model during different periods and avoids the problems of heteroscedasticity and serial correlation problems. Also, is used when there is more than one equation. It accomplishes this by weighting the estimates using the covariance of the residuals from the individual regressions (Greene, 2005).

3.3 Data

The data for countries were collected in five waves [(1994–1998)/(1999–2004)/(2005–2009)/(2010–2014)/(2017–2021)]. Our study expands the sample size to include all countries of the WVS from 1994 to 2021. The analysis started with the third wave 1994–1998 due to the small size of the sample in both the first wave 1981–1984 (11 countries) and the second wave 1989–1993 (21 countries), which is insufficient to estimate the model using the OLS method. Also, the first wave of WVS was implemented mainly in high-income countries while the second wave was in both middle and high-income countries.

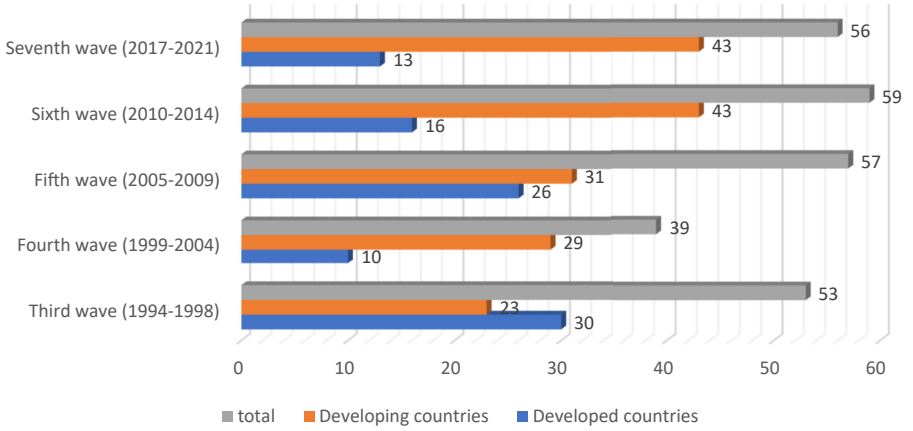
The most intriguing feature of Figure 1 is the rise in the number of developing countries to developed countries that participate in the WVS (see Table 1).

4. Results and discussion

4.1 The descriptive analysis

This section presents the descriptive statistics of the cultural values used according to each of the five waves of the WVS covered in our analysis.

In the third wave (see Figure 2 and Table 2), Australia had the highest value on the "post-materialism", which runs from −2 to 2.61. "Trust" was between (1.35 and 1.97), where Brazil



Source(s): The classification according to https://unctadstat.unctad.org/EN/Classifications.html, Figure by authors

Figure 1. Classification of countries

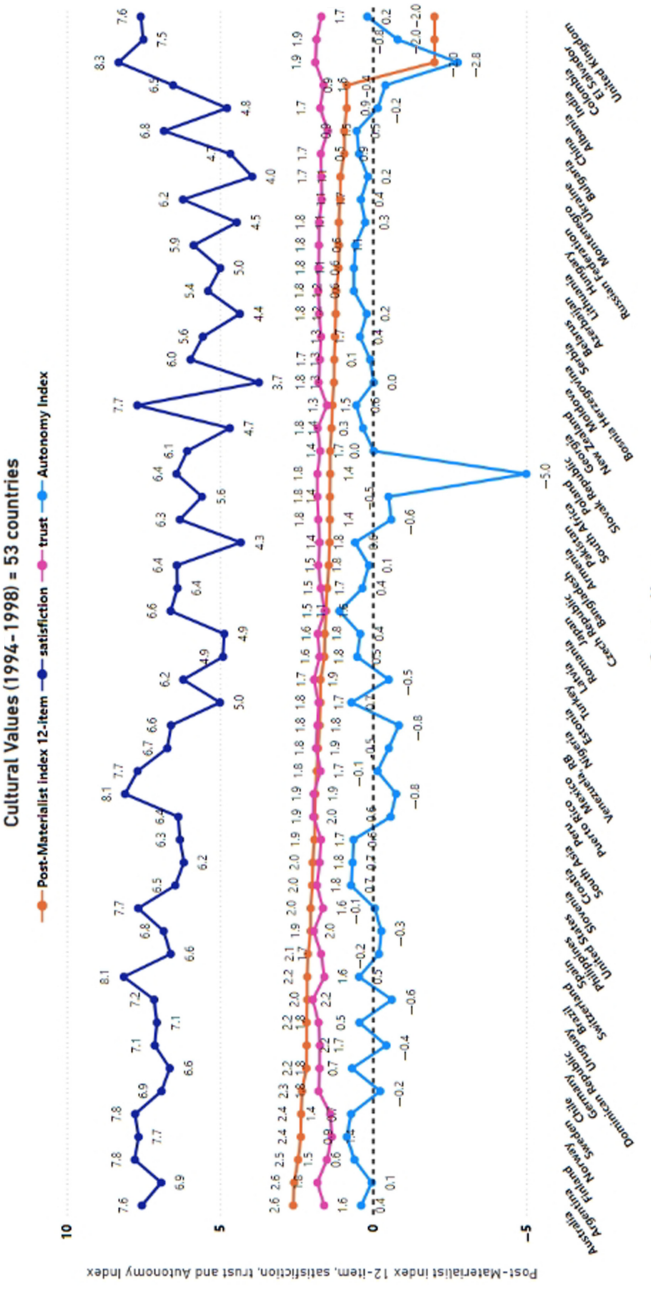
Values	Definition According to WVS
TRUST	Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? 1. Most people can be trusted 2. Need to be very careful
SATISFACTION	All things considered, how satisfied are you with your life as a whole these days?" where the level of life satisfaction is measured from 1 "completely dissatisfied" to 10 "completely satisfied with life"
POST_MATERIALIST_ INDEX	is calculated for each list based on the methodology of Granato *et al.* (1996). The value 3 (which represents the post-material) is given when choosing the goals related to freedom of opinion and expression and the goals related to the advancement of society, and the value is 1 (which represents the material) When choosing the security and economic goals of the country, the value 2 is set, which represents the choice of two goals, one representing post-materialism and the other representing materialism
AUTONOMY _INDEX	is computed based on the children's quality battery. It represents the respondents' response to motivating children with specific values, such as autonomy, determination, obedience, and religious faith

Source(s): Compiled by the authors

Table 1. Cultural values

had the highest value, while Norway had the lowest value. The "autonomy" ranged from (−5) to (1.1), with Poland having the lowest rating and Japan having the highest. The "life satisfaction" varied from 3.73 to 8.31, with Moldova having the lowest value. Colombia, Switzerland, and Puerto Rico have the highest values.

The WVS (1999–2004) contained 10 developed countries only. According to Figure 3 and Table 3, Japan had the highest value for "autonomy" (1.40), followed by South Korea and Sweden, while Morocco had the lowest value (−0.97). As for the "post-materialism", Canada had the highest value (2.96), followed by Sweden, while Albania had the lowest value (1.1). On the "life satisfaction", Puerto Rico had the highest value (8.49), followed by Canada and Mexico. On the other hand, Tanzania had the lowest "satisfaction" at (3,87). As for "Trust",



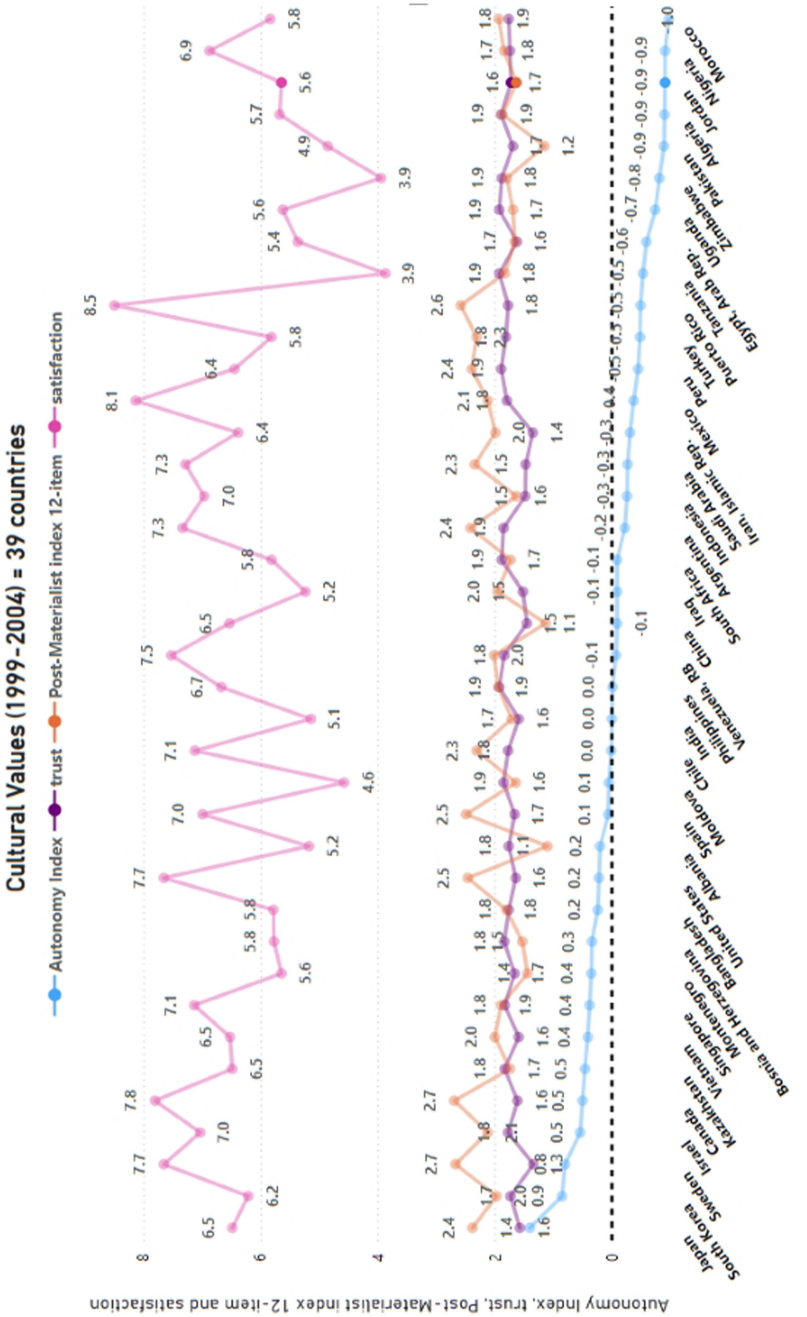
Source(s): Figure by authors based on WVS

Figure 2.
Descriptive analysis of cultural values during the third wave (1994–1998)

	GDP_PER_CAPITA_3	TRUST_3	SATISFACTION_3	POST_MATERIALIST_INDEX_3	AUTONOMY_INDEX_3	FDI_3	TRADE_3	SCHOOL_3
Mean	8752.413	1.738679	6.308491	1.451887	0.004340	4.082642	63.17623	92.20868
Median	3003.180	1.750000	6.420000	1.540000	0.210000	3.590000	55.77000	92.21000
Maximum	48144.58	1.970000	8.310000	2.610000	1.100000	22.95000	156.8400	99.94000
Minimum	324.1500	1.350000	3.730000	−2.000000	−5.000000	0.310000	16.44000	62.07000
Std. Dev	12045.54	0.129645	1.176282	0.973100	0.942292	3.838558	30.19681	7.006395
Skewness	1.651530	−0.851217	−0.379439	−2.422040	−3.320825	2.517703	0.698585	−2.211275

Source(s): Authors' calculations

Table 2.
Descriptive analysis of cultural values during the third wave (1994–1998)



Source(s): Figure by authors based on WVS

Figure 3.
Descriptive analysis of cultural values during the fourth wave (1999–2004)

	GDP_PER_CAPITA_4	TRUST_4	SATISFACTION1_4	POST_MATERIALIST_INDEX_4	AUTONOMY_INDEX_4	FDI_4	TRADE_4	SCHOOL_4
Mean	6697.370	1.716923	6.291282	1.945128	−0.093333	3.132821	68.22436	90.90154
Median	1789.860	1.760000	6.440000	1.930000	−0.090000	1.750000	58.71000	90.90000
Maximum	38023.16	1.920000	8.490000	2.690000	1.400000	21.20000	349.2900	99.86000
Minimum	245.5000	1.340000	3.870000	1.100000	−0.970000	−0.130000	19.56000	56.72000
Std. Dev	10208.40	0.157983	1.090852	0.405235	0.552384	4.040114	55.02580	7.157496
Skewness	1.756405	−0.749101	−0.209197	−0.092859	0.343557	2.816248	3.528766	−2.841976

Source(s): Authors' calculations

Table 3.
Descriptive analysis of cultural values during the fourth wave (1999–2004)

the Philippines had the highest value (1.92), while Sweden had the lowest value (1.34), despite Sweden being one of the developed countries.

Among the 57 countries in the fifth survey, there are 26 developed countries (see Figure 4 and Table 4). Japan had the highest "autonomy" (1.37), followed by Switzerland and Germany, while Iraq had the lowest value (−1.14). As for "Post-materialism", Andorra had the highest value (2.89), whereas Colombia and Iraq had the lowest value (−2). Although Colombia had the lowest "post-materialism", it had the highest "satisfaction" (8.31), and Iraq had the lowest "satisfaction" (4.46). For "trust", Trinidad and Tobago had the highest value (1.96), while Norway had the lowest value (1.29).

According to Figure 5 and Table 5, "post-materialism" ranged between (0.93 and 2.82), Sweden had the highest value, and Tunisia had the lowest value. The "trust" index was between (1.35 and 1.97), with Brazil having the highest value while Norway having the lowest value. The "autonomy" index ranged between (−0.93 and 1.26), Japan had the highest value, while Yemen had the lowest value. The "satisfaction" index ranged from 4.85 to 8.5. Mexico had the highest value and Egypt had the lowest value.

Across the 56 countries covered by the seventh survey (see Figure 6 and Table 6), Japan scored the highest "autonomy"(1.16), while Egypt had the lowest value (−1.12). In the post-materialism, Germany had the highest value at (3.04), while Egypt also had the lowest value at (1.07). As for "satisfaction", Kazakhstan reached the highest value at (8.38), and Iraq had the lowest value at (4.46). In the "trust" index, Zimbabwe had the highest value (1.98), while China had the lowest value (1.35).

It is worth noting that developed countries have the highest value of "autonomy"[4], "post-materialism", and "life satisfaction". In contrast, developing countries have the highest value of "trust".

The descriptive analysis illustrated the mean of cultural values during the five waves. The average of cultural values did not differ significantly, but it increased slightly over the five waves. The "trust" index rose as the number of developing countries increased, indicating a general trend toward more trust. Also, There was a tendency for "post-materialism", indicating a preference for preserving the environment and freedom of opinion. The "autonomy" likewise favored autonomy and determination rather than obedience, and religious faith except for the fourth wave, which was negative.

4.2 Correlation between cultural values and economic growth

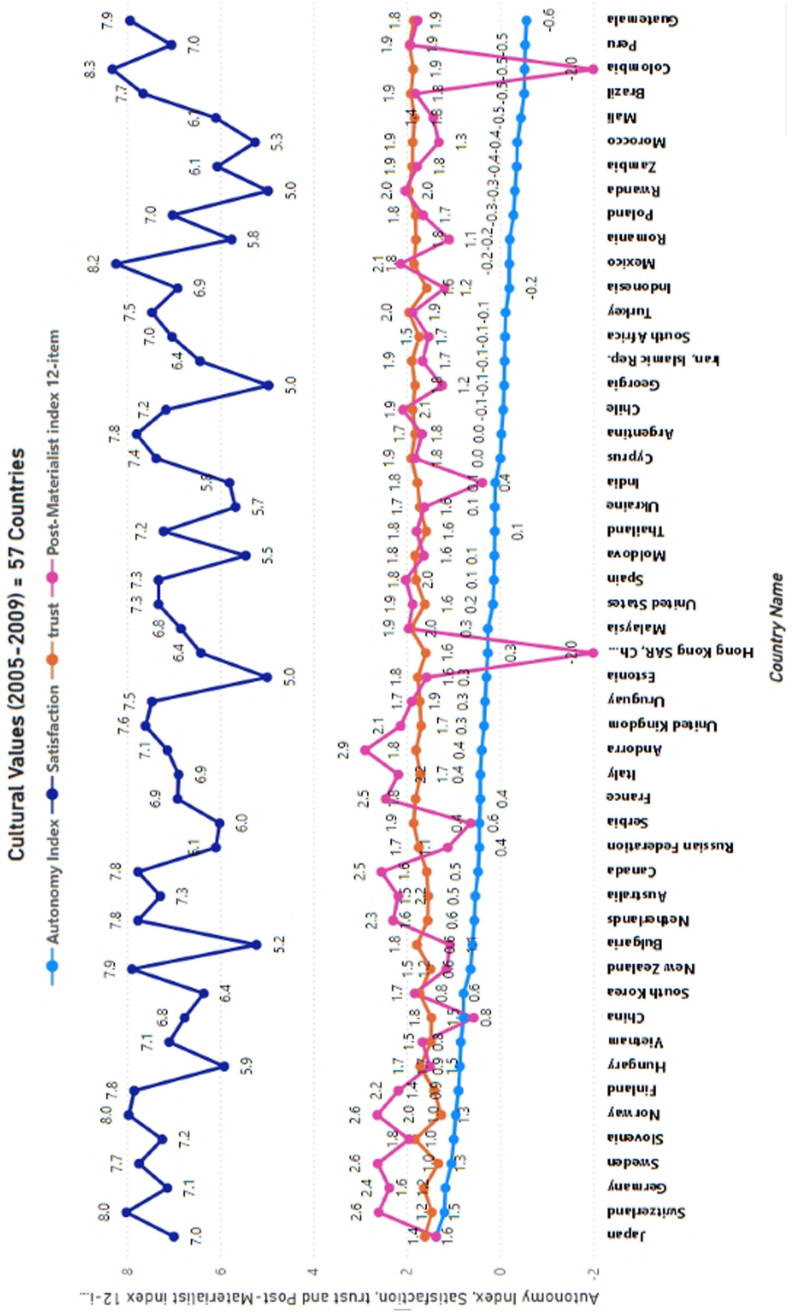
Table 7 shows that "trust" is the most significant cultural value related to GDPP in all five waves except the fourth wave. However, it is inversely related to GDPP. Followed by "autonomy", which was positively and significantly related to GDPP. On the other hand, although "satisfaction" is positively and significantly related to GDPP in all waves, it was insignificant in the seventh wave. Likewise, "post-materialism" was directly and significantly related to GDPP in all waves except the third wave.

4.3 Estimation results

Table 8 illustrates the OLS estimates for each wave from (1994–1998) to (2017–2021).

The findings in Table 8 indicate that the five models are significant when evaluated against the F statistic, where Prob (F-statistic) < 0.05 and R-squared exceeded 50%, representing the explanatory power of the independent variables in interpreting the dependent variable.

A closer inspection of Table 8, The Breusch-Godfrey serial correlation LM test exhibits probability values more than (0.05) for R-squared that are significant to accept the null hypothesis implying that there is no autocorrelation in the residuals generated from the regression model. The Breusch-Pagan-Godfrey heteroskedasticity test presents probability



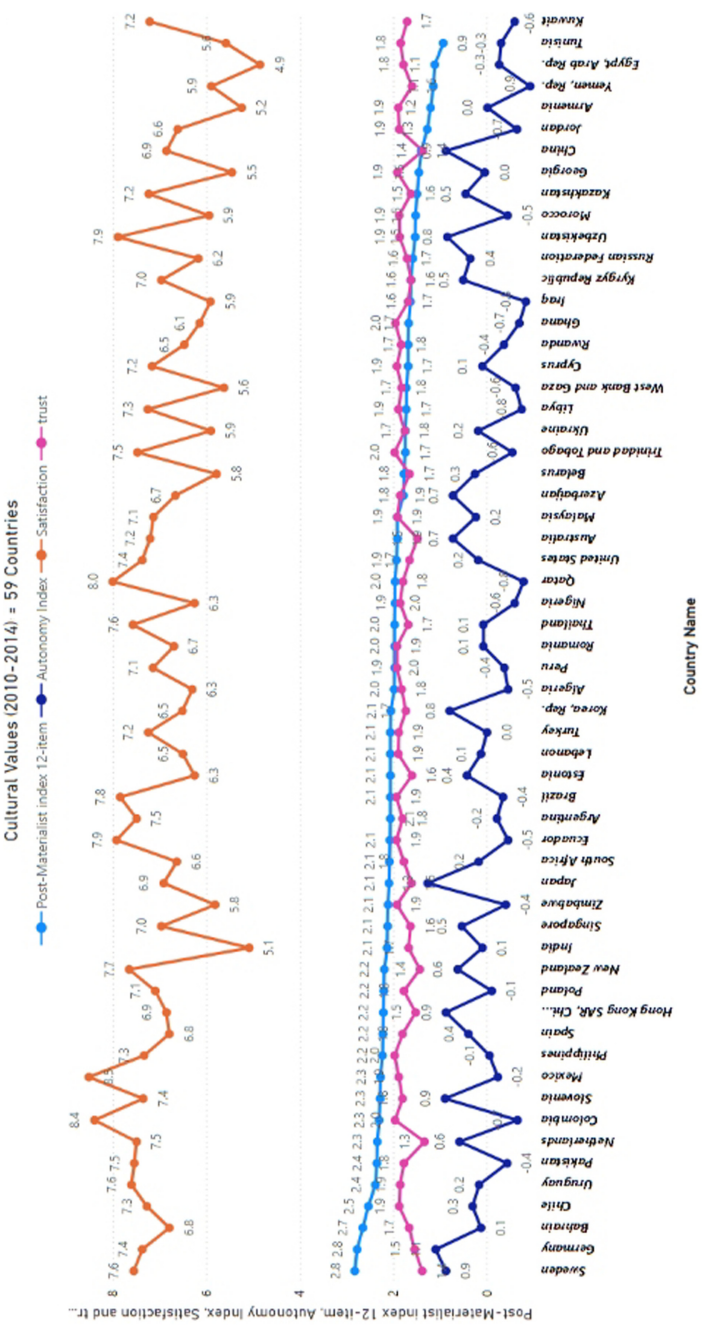
Source(s): Figure by authors based on WVS

Figure 4.
Descriptive analysis of cultural values during the fifth wave (2005–2009)

Table 4.
Descriptive analysis of cultural values during the fifth wave (2005–2009)

	GDP_PER_CAPITA_5	TRUST_5	SATISFACTION_5	POST_MATERIALIST_INDEX_5	AUTONOMY_INDEX_5	FDI_5	TRADE_5	SCHOOL_5
Mean	20420.60	1.729825	6.768070	1.552281	0.135439	6.818070	83.98228	93.30000
Median	10016.57	1.780000	7.030000	1.770000	0.120000	4.360000	69.51000	93.69000
Maximum	96944.10	1.960000	8.310000	2.890000	1.370000	47.42000	376.6600	99.83000
Minimum	249.3600	1.260000	4.460000	−2.000000	−1.140000	−0.400000	27.26000	35.49000
Std. Dev	22214.49	0.165686	0.956335	0.984173	0.591563	9.089940	52.66513	9.017330
Skewness	1.252626	−0.840745	−0.532910	−2.414882	−0.022242	3.169447	3.244503	−4.912734

Source(s): Authors' calculations



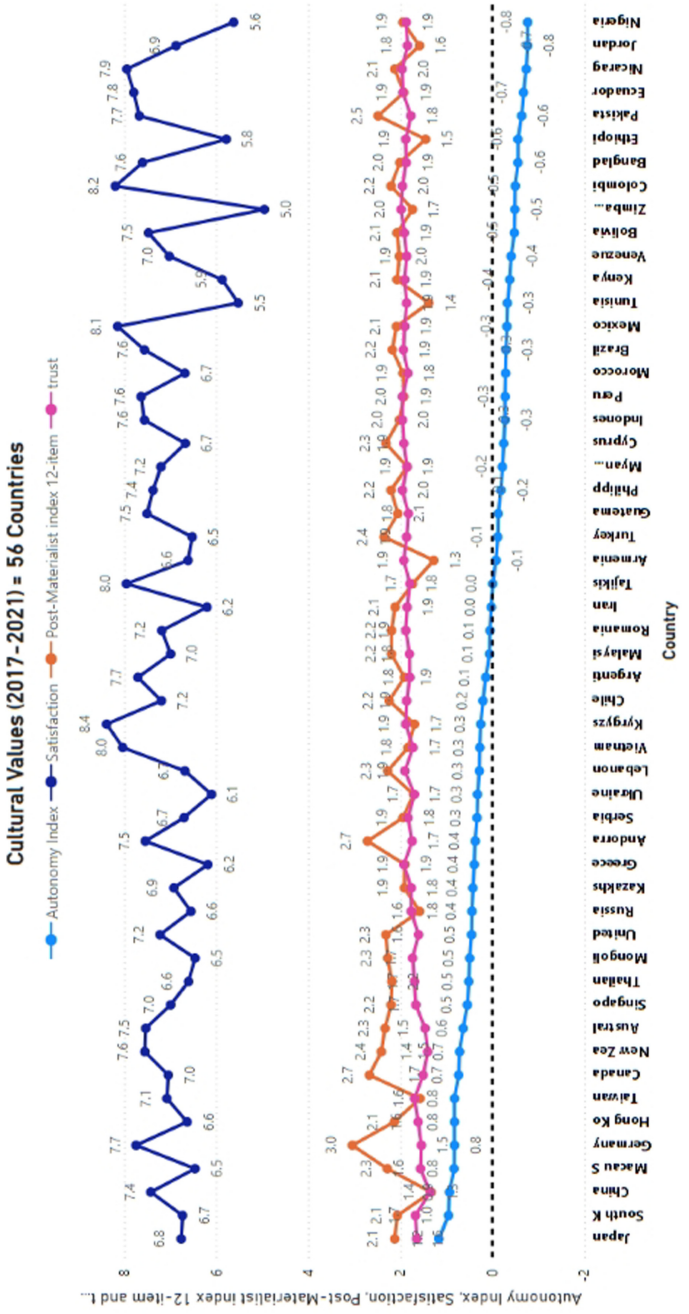
Source(s): Figure by authors based on WVS

Figure 5.
Descriptive analysis of cultural values during the sixth wave (2010–2014)

Table 5.
Descriptive analysis of cultural values during the sixth wave (2010–2014)

	GDP_PER_CAPITA_6	TRUST_6	SATISFACTION_6	POST_MATERIALIST_INDEX_6	AUTONOMY_INDEX_6	FDI_6	TRADE_6	SCHOOL_6
Mean	17782.31	1.760169	6.823559	1.924407	0.043729	5.637458	88.67932	90.28864
Median	9547.850	1.800000	6.960000	1.970000	0.070000	2.170000	66.27000	90.29000
Maximum	85050.68	1.970000	8.510000	2.820000	1.260000	108.6400	442.6200	99.86000
Minimum	722.8900	1.330000	4.850000	0.930000	−0.930000	−4.140000	25.79000	56.72000
Std. Dev	19661.66	0.161475	0.818697	0.393526	0.550438	15.10453	70.77885	7.910878
Skewness	1.546204	−0.895714	−0.369070	−0.236122	0.191450	5.730135	3.235888	−2.415244

Source(s): Authors' calculations



Source(s): Figure by authors based on WVS

Figure 6.
Descriptive analysis of cultural values during the seventh wave (2017–2021)

Table 6.
Descriptive analysis of cultural values during the seventh wave (2017–2021)

	GDP_PER_CAPITA_7	TRUST_7	SATISFACTION_7	POST_MATERIALIST_INDEX_7	AUTONOMY_INDEX_7	FDI_7	TRADE_7	SCHOOL_7
Mean	15533.35	1.792909	6.972000	2.008909	0.032909	3.317455	81.46945	91.52945
Median	6957.790	1.850000	7.040000	2.060000	0.020000	2.470000	65.80000	91.53000
Maximum	87526.08	1.980000	8.380000	3.040000	1.160000	26.83000	376.9300	99.10000
Minimum	771.5200	1.350000	4.460000	1.070000	−1.120000	−4.350000	27.48000	67.57000
Std. Dev	20339.77	0.151519	0.822625	0.362474	0.556885	4.897820	63.39576	4.234108
Skewness	1.752625	−1.129152	−0.757177	−0.087206	0.037761	3.245883	3.030222	−3.385772

Source(s): Authors' calculations

values above (0.05) for R-squared that are significant for the null hypothesis implying that homoscedasticity is present.

According to the OLS analysis, all cultural values were significant in at least two waves. However the significance of cultural values varied across the five waves, the sign of each variable was unchanged. "Post-materialism", "autonomy", and "satisfaction" all had a positive impact on GDPP, whereas "trust" had an inverse effect. So the SUR model would be used to

Variables	3rd Wave 1995–1998	4th Wave 1999–2004	5th Wave 2005–2009	6th Wave 2010–2014	7th Wave 2017–2022
TRUST	−0.60***	−0.29*	−0.61***	−0.53***	−0.66***
LIFE SATISFACTION	0.48***	0.56***	0.52***	0.40***	0.06
POST_MATERIALIST_INDEX	0.20	0.63***	0.40***	0.41***	0.52***
AUTONOMY _INDEX	0.27**	0.52***	0.62***	0.38***	0.61***

Note(s): (***), (**), and (*) indicate the significance of the estimated coefficients at (1%), (5%), and (10%) levels of significance, respectively
Source(s): Authors' estimation

Table 7. Correlation between cultural values and economic growth

Variables		3rd Wave 1994–1998	4th Wave 1999–2004	5th Wave 2005–2009	6th Wave 2010–2014	7th Wave 2017–2021
Constant		2.552	2.960	3.106	4.328**	6.3224*
Cultural variables	TRUST	−2.435*	−0.889	−0.8104	−2.110**	−2.3138*
	SATISFACTION	0.581**	0.444**	0.5372***	0.379**	−0.0673
	POST_ MATERIALIST_ INDEX	0.161	1.516***	0.0953	0.491	1.4630***
	AUTONOMY _INDEX	0.168	0.383	0.7952**	0.126	0.5080
Economic variables (Control variables)	FDI_TO_GDP	0.006	0.036	0.0203	0.006	−0.0724*
	TRADE_TO_GDP	0.006	0.003	0.0005	0.002	0.0069**
	SCHOOL_ ENROLLMENT_ PRIMA	0.060*	0.004	0.0361**	0.053***	0.0426
N (Countries)		53	39	57	59	56
R-squared		0.459	0.657	0.589	0.590	0.5932
R-squared (adj.)		0.375	0.579	0.530	0.534	0.5327
F. Statistics		5.447681	8.481	10.028	10.495	9.7926
Prob(F-statistic)		0.000142	0.000	0	0.000	0.0000
Diagnosis Tests						
Serial Correlation LM Test: Breusch-Godfrey (Chi-squared) Null Hypothesis (H0): *there is no serial correlation*		4.103364 (0.1285)	4.894958 (0.0865)	2.126108 (0.1306)	3.343257 (0.1879)	1.127863 (0.5690)
Heteroskedasticity Test: Breusch-Pagan-Godfrey (Chi-squared) Null Hypothesis (H0): Homoscedasticity is present		4.680588 (0.6989)	10.43826 (0.1651)	7.881646 (0.3431)	8.202674 (0.3151)	10.34206 (0.1700)

Note(s): (***), (**), and (*) indicate the significance of the estimated coefficients at (1%), (5%), and (10%) levels of significance, respectively Breusch-Godfrey tests for serial correlation, The Breusch-Pagan test is used to determine whether or not heteroscedasticity is present in a regression model
Source(s): Authors' estimation

Table 8. OLS estimates and diagnosis tests

demonstrate the effect of cultural values over the entire sample. Table 9 estimates, using a SUR model, the effect of cultural values on GDPP through five models (see Appendix 2).

The Wald test indicates that the SUR model is significantly based on the Chi-square statistic.

Table 9 presents the results of the SUR analysis, which indicate the significance of the four cultural values in GDPP based on the five waves. As shown in Table 9, "trust" has a negative and significant impact on GDPP, if "trust" increases by 1%, the GDPP will be a 1.54% decrease. It was hypothesized that high "trust" leads to high economic growth, but this hypothesis is rejected. This contradictory finding might be a result of the WVS trust scale (Table 1) leaving the interpretation of who "most people can be trusted" to the evaluation of the participants, who may interpret it differently according to their circumstances and societies. While some participants may think they are being asked about people within their community, others may think of the country's institutional environment.

Concerning "satisfaction", the estimated coefficient is positive and highly significant for all waves. In specific terms, a 1% increase in "satisfaction" will result in a 0.54% increase in the GDPP. Yet, according to the OLS estimates, life satisfaction harms economic growth in the seventh wave and has an insignificant effect on the fourth wave.

According to SUR estimation, post-materialism had a significant positive impact on GDPP. In particular, a 1% increase in "post-materialism" results in a 0.28% rise in the GDPP. According to Inglehart's post-materialist theory, individuals who promote economic growth at the expense of environmental deterioration suffer lower economic growth.

Another noteworthy result indicated that the GDPP was positively impacted by "autonomy", with a 0.42% gain in GDPP for every 1% increase in "autonomy". In other words, if individuals believe that economic achievement or economic failure depends on their

System: SUR_WAVES
Estimation method: Seemingly unrelated regression
Total system (unbalanced) observations 263
Linear estimation after one-step weighting matrix
Estimated equations

L (GDPP)= C(1)*TRUST + C(2)*SATISFACTION + C(3)*POST_MATERIALISM + C(4) *AUTONOMY + C(5)*FDI + C(6)*TRADE + C(7)*SCHOOL + C(8)

	Coefficient	Std. Error	*t*-Statistic	Prob
C(1)	−1.54029	0.456687	−3.37275	0.0009
C(2)	0.547449	0.06606	8.287123	0
C(3)	0.276658	0.09249	2.991229	0.0031
C(4)	0.421799	0.118439	3.561308	0.0004
C(5)	0.00453	0.006794	0.666746	0.5055
C(6)	0.003596	0.001129	3.185146	0.0016
C(7)	0.04257	0.008543	4.98277	0
C(8)	3.066689	1.164047	2.634506	0.0089
Determinant residual covariance		1.081827		

Wald Test
Null Hypothesis: C(1) = 0,C(2) = 0,C(3) = 0,C(4) = 0,C(5) = 0,C 6) = 0,C(7) = 0,C(8) = 0

Test statistic	Value	df	Probability
Chi-square	25288.57	8	0.0000

Source(s): Authors' estimation

Table 9.
SUR estimation

efforts, autonomy, and determination, they are assumed to work hard to earn a better return for their products and enhance their well-being. Accordingly, if individuals have more control over their choices, the general level of economic growth in their country will be greater.

5. Conclusion and implications

A few studies indicate that a nation's culture affects economic growth, but this relationship has not been quantified, making it challenging for policymakers to consider it when establishing policies. Researchers did not reach a specific conclusion regarding the relationship between cultural values and economic growth, as several studies concluded that there is no relationship between cultural values and economic growth (Pryor, 2005; Hanson, 2009). However, some studies clearly show the relationship between cultural values and economic growth (Granato *et al.*, 1996).

This study replicated the approach used in the GIL study, using cultural variables alongside economic variables to explain economic growth. This study added the "trust" and "satisfaction" beside the "autonomy" and the "post-materialism". In addition, the current study expands the sample size to include all countries in WVS from 1994–1998 to 2017–2021 to examine the impact of cultural variables on economic growth over 27 years.

Although the empirical evidence regarding the relationship between cultural values and economic growth is conflicting. The study empirically analyzes the impact of the four cultural values on GDPP. Utilizing OLS and SUR, the study concluded that "autonomy", "post-materialism", and "satisfaction" positively affect economic growth. The most striking finding is that "trust" has a negative and significant impact on GDPP. It is noteworthy that the highest values of "autonomy," "post-materialism," and "life satisfaction" are found in developed countries. Conversely, the value of "trust" is highest in developing countries.

The conducted research supports the hypothesis that culture and economic systems are interconnected, so bringing up specific values in society is likely to lead to better overall economic performance. These findings not only highlight the interdependence of culture and economic growth but also underscore the potential for cultivating conducive cultural values to enhance overall economic well-being.

Additional evidence from this study implies that the two stylized facts mentioned in the economic growth literature may be expanded to include cultural values, which is another important finding. These new fundamentals are: (1) When values and beliefs support autonomy, post-materialism, and satisfaction in the population, leading to economic growth. (2) Economic growth increases within geographical boundaries where values and beliefs support generalized values.

Based on the paper's findings, it is clear that considering the elements that influence people's behavior and thus implementing behaviorally informed policies allows for more effective policy formation. This led to substantiating the claim that there is a significant link between cultural values and economic growth. This conclusion structures a whole system of values that might promote rather than undermine economic growth. As a result, many governments are advised to enhance their present policies with nudges to improve the effectiveness of cultural values. To accomplish this, many countries, notably the United States, the United Kingdom, and Australia, have established specialist departments and centers for behavioral economics.

It is also crucial to contemplate how to promote values that have a positive effect on economic growth. Consequently, this study has three major implications. The first implication is that it must be a conscious invitation to political leaders, economists, and policymakers to invest substantial effort in creating a political and socioeconomic environment in which cultural values can stimulate economic growth.

Second, behavioral and experimental economics can be used to investigate how policies should be established to leverage cultural values to enhance economic growth. Values can be

built and nudged, such as satisfaction, post-materialism, trust, and autonomy in society. Also, cultural values may be promoted by a variety of means, including education, media, and cultural investment.

Third, governments and public policymakers must develop methods for assessing the level of cultural values in their country, rather than relying on international organizations (which are limited to a specific sample and period). They must also pay attention to cultural values surveys, which should take place at least once a year. So that scholars may accurately assess the influence of such values on economic growth. As well as determining effective procedures for motivating these values to accomplish the desired objectives.

6. Limitations and future research

The study's conclusions highlight the need to concentrate on the ways that cultural values affect people's behavior and economic outcomes. Economists, policymakers, and scholars seldom ever addressed these issues in the past. The study's conclusions have several important implications for how policies are implemented in the future. It is necessary to conduct more research to confirm the influence of cultural values on economic growth. To determine the process underlying the influence of a specific cultural dimension or component on economic performance, researchers ought to focus on testing theory-based hypotheses.

Overall, our research results open up promising avenues for future research, which we have not covered in this paper due to space and data limitations. It is crucial to acknowledge certain possible limitations associated with the paper. Although the study presents an argument for the inclusion of cultural values in economic analysis, it is challenging to precisely quantify the influence of culture due to its inherent intricacies and subtleties. The future studies might examine approaches to get around these challenges and improve the suggested frameworks for more reliability and accuracy.

Notes

1. The study included 119 countries from 1974–1989 and examined more than 50 variables. A model was used, which divided the explanatory variables of economic growth into variables. The study concluded that most variables have a weak relationship with economic growth. However, the contribution of FDI and foreign trade to GDP has a significant positive impact on economic growth.
2. The study showed the importance of education for economic growth in the long term, by using data from 100 countries from 1960 to 1995.
3. Data for the control variables were obtained from the World Bank.
4. Especially Japan, which had the highest autonomy score among the five waves.

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Appendix 1

WVS	World values survey
GIL	The study of Granato *et al.* (1996), "The effect of cultural values on economic development: theory, hypotheses, and some empirical tests"
OLS	Ordinary Least Squares
SUR	Seemingly Unrelated Regression
GDPP	GDP per capita

Table A1. List of abbreviations

Source(s): Compiled by the authors

Appendix 2

The SUR system equations.

(1) LGDPP_3 = C(1)*TRUST_3+C(2)*SATISFACTION_3+C(3)*POST_MATERIALIST_INDEX_3+ C(4)*AUTONOMY_INDEX_3+C(5)*FDI_3+C(6)*TRADE_3+C(7)*SCHOOL_3+C(8)

(2) LGDPP_4 = C(1)*TRUST_4+C(2)*SATISFACTION_4+C(3)*POST_MATERIALIST_INDEX_4+ C(4)*AUTONOMY_INDEX_4+C(5)*FDI_4+C(6)*TRADE_4+C(7)*SCHOOL_4+C(8)

(3) LGDPP_5 = C(1)*TRUST_5+C(2)*SATISFACTION_5+C(3)*POST_MATERIALIST_INDEX_5+ C(4)*AUTONOMY_INDEX_5+C(5)*FDI_5+C(6)*TRADE_5+C(7)*SCHOOL_5+C(8)

(4) LGDPP_6 = C(1)*TRUST_6+C(2)*SATISFACTION_6+C(3)*POST_MATERIALIST_INDEX_6+ C(4)*AUTONOMY_INDEX_6+C(5)*FDI_6+C(6)*TRADE_6+C(7)*SCHOOL_6+C(8)

(5) LGDPP_7 = C(1)*TRUST_7+C(2)*SATISFACTION_7+C(3)*POST_MATERIALIST_INDEX_7 + C(4)*AUTONOMY_INDEX_7+C(5)*FDI_7+C(6)*TRADE_7+C(7)*SCHOOL_7+C(8)

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