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Post-materialism and economic growth: Cultural backlash, 1981–2019

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ABSTRACT

In recent decades it seems that various factors have led to a cultural background change, which although mainly characterized as incremental, in some cases can be sudden. A question therefore arises as to whether the way in which the cultural background has evolved during last decades affects the growth rate of economies. We use an unbalanced panel dataset comprised from 34 OECD countries from 1981 to 2019, and a Least Squares Dummy Variable Correction (LSDVC) method as well as a series of robustness tests including different methods of analysis, adding control variables and breaking the overall period into subperiods. We conclude that the cultural background during the overall period under consideration is characterized as post-materialistic and harms economic growth. Moreover, we highlight both theoretically and empirically the cultural backlash hypothesis since the cultural background of the countries under analysis presents a shift from traditional/materialistic (from 1981 up to 1998) to post-materialist values (from 1999 up to 2019). Doing so, we conclude on a positive effect of cultural background on economic growth when traditional / materialistic values prevail, and a negative effect when post-materialistic values prevail. These results highlight culture as a crucial factor for economic growth and indicate that economic policy makers should take it seriously into account before designing economic policy and in order to explain the effectiveness of economic policies implemented.

1. Introduction

The change in cultural values over time is an issue of concern for economic science as it is responsible for shaping economic, political, and social life. Human behavior and ultimately economic decisions and actions depend heavily on the cultural background of individuals (Throsby, 2001). Indeed, the characteristics that are passed on from one generation to the other appear to have a significant impact on the development and growth of economies (Spolaore and Wacziarg, 2013). It is a process of cultural evolution where a set of processes takes place (Boyd and Richerson, 2005), in which the cultural background is transmitted between individuals/societies and across generations, including elements of psychology and communication.

The literature on cultural background change focuses mainly on the fact that this change is particularly slow (Johnston, 1996; De Jong, 2009; Schwartz, 2009). However, various developments taking place mainly in developed economies in recent decades seem to have led to either an incremental change or a sudden change in the cultural background. As a result, "examining" a broader period of

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analysis may be valuable in understanding the impact of cultural background changes on economic growth. Norris and Inglehart (2019) report that in recent decades, there is a process of changing the cultural background of societies from traditional/materialistic to post-materialist values in the developed western world.

At the same time, the emergence of post-materialistic values has been shown to be associated with a lower rate of economic growth (Inglehart, 1988). Of course, this may be attributed to other factors, economic or not. Martin (2017) points-out that the decline in growth rates may is the effect of slowdown in productivity growth and lower capacity utilization and Gordon (2018) suggests the critical role of demographic factors, declining labor force participation and rising inequality. However, this article focus on the critical role of the cultural background on the slowdown of economic growth.

The scope of the present paper is twofold. Firstly, the analysis attempts to highlight theoretically and empirically the cultural backlash hypothesis which regards the developed economies of the western world in recent decades. Secondly, the present paper seeks to examine the way the prevalence of traditional / materialistic or post-materialistic values is linked (positively or negatively) to economic growth. In this direction, there is examined the impact of the cultural background on economic growth over an entire period of four decades (1981–2019) which is one of the novelties of the paper. For this purpose, a broad definition of the cultural background is used, defined by the cultural values of generalized trust, respect, independence, work ethic, competition affinity, religion, and trust in political institutions. These values make it possible to classify the cultural background of the countries included in the analysis as traditional/materialistic or post-materialistic, based on Inglehart and Baker (2000). The analysis of the paper is based on a sample of 34 OECD countries. Through the empirical analysis there is proven 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. Moreover, the analysis also concludes on a positive effect of cultural background on economic growth when traditional / materialistic values prevail, and a negative effect when post-materialistic values prevail.

The rest of the paper is organized as follows. Section 2 presents a literature review on the change of the cultural background, while Section 3 presents a literature review on the effects of cultural background on economic growth. Section 4 describes the data and method used in the empirical analysis, and Section 5 presents the empirical results. Finally, Section 6 presents the discussion and the conclusions.

2. Cultural background change

The change in cultural values over time is an issue of great concern to economic science, as it is responsible for shaping the economic, political, and social life of societies. In the relevant literature, the general observation about the change of cultural background is that it remains relatively stable over time "under normal conditions." This conclusion can be drawn when one considers that the cultural dimensions that shape the cultural background remain relatively constant over time as well (Johnston, 1996; De Jong, 2009; Petrakis and Kostis, 2013, 2014). However, the term "under normal conditions" leaves plenty of room for questioning and testing over these conditions.

As Boyd and Richerson (2005) argue, cultural background change may be sourced either from one's psyche, as some ideas become easier to understand or more easily memorized, or to social factors because some ideas make individuals richer, increase their survival rates or are transferred more frequently, and this whole process generates cultural change. Exposed to conditions and values different from their own, individuals develop a defensive and adaptive mechanism at the same time called "cultural eclecticism" (Peterson and Kern, 1996). It is the mechanism by which certain behaviours and values are accepted and adopted by individuals, while others reject them, and others partially adopt them (Caldwell and Millen, 2008). Besides, changes that take place in the cultural background usually lead to the need for new complementary, to the original, changes (Dressler and Carns 1969). What is important is whether the new behaviours are considered socially desirable and useful. Thus, the importance of cultural change is not the same in all cases, as change may occur, for example, because the adoption of a behavior is deemed necessary for the survival of the individual or, in other cases, to meet social needs.

The present paper fills the limitation in the relevant literature about cultural background change, since most studies assume that culture does not change easily and fast. In this section, extending this literature, there are presented a series of mechanisms through which we should expect cultural background changes in the short-, medium- or the long-run, characterized as incremental or sudden changes. Moreover, the literature review provided leads to the strengthening of the argument provided by Inglehart (1988) and Norris and Inglehart (2019) on how the cultural background has evolved in recent decades has led to a transition from traditional/materialistic to post-materialist values, which is one of the critical hypotheses tested through the empirical analysis of the present paper.

2.1. *Incremental change*

The factors that externally influence the creation and shaping of the cultural background of a society are linked to specific conditions that prevail in that society. External influences of the cultural background are factors that usually change over a very long-time horizons such as available resources, climate, and geographical characteristics in general (McClelland, 1961; Diamond, 1999; Triandis, 2009). As these factors create the backgrounds for shaping the cultural background of a society, any change they experience is correspondingly influencing the prevailing cultural background. Globalization, the aging of the population as well as developments such as generational replacement, increased access to higher education, urbanization, increased gender equality and increased national diversity, has led to a shift in cultural values from traditional/materialistic to post-materialistic, since 1970 (Norris and Inglehart, 2016, 2019). These developments have brought and are expected to bring about incremental changes in the cultural background. It is a "silent revolution" of social behaviours (Inglehart, 1990) that Norris and Inglehart (2019) call "cultural backlash".

2.1.1. Available resources, climate, geographical features and extreme events

The availability as well as the mobility of resources has a significant impact on the cultural background. The more resources and the more accessible the resources available in a society are, the greater the possibility that people will be optimistic and not possessed by insecurity and suspicion. In addition, when available resources move easily, then "honor" psychologies develop as a means of protecting third-party assault on easily moving wealth (Petrakis, 2014). A revolutionary technological change, which will affect for example the availability of resources and the production process, is expected to bring about a change in the cultural background of individuals.

Climate effects are observed in the psychology and cultural background of members of society (McClelland, 1961; Tavassoli, 2009; Petrakis, 2014). Low temperatures are associated with the adoption of privacy and introversion. Also, individuals are more disciplined and obey the terms and rules of the community (Triandis, 1995). At the same time, climate influences individual behavior through "homeostasis" (Petrakis, 2014), i.e. the process by which the human body, mainly through blood circulation, adapts to the external environment (Tavassoli, 2009).

The geographical relief is another factor shaping the cultural background. If the geographical relief leads to the cultural isolation of a society, then homogenized reactions and more homogenized cultural backgrounds develop. In this case it is possible that cultural regulations are imposed with greater tightness (Triandis, 2009; Petrakis, 2014).

In addition, if extreme events (earthquakes, floods, etc.) occur frequently, people do not engage in programming and scheduling for the future. In fact, if this is combined with limited resources, it increases the cultural value of uncertainty. However, the existence of resources can lead individuals to the opposite effect, that of over-programming, for precautionary reasons (Petrakis, 2014).

2.1.2. Globalization and aging

Globalization is also considered an important factor in changing the cultural values of societies. Through it, the different cultural backgrounds communicate and interact as a number of processes take place, such as trade and migration. The development of technology has also contributed in this direction. As globalization is an inevitable process for both developed and emerging economies, it is interesting how societies and individuals adapt to impending change. The theory of modernization (Inglehart and Baker, 2000) argues that different cultural backgrounds between societies tend to converge due to the changes that globalization brings to social and economic structures. The consequence of globalization is the creation of a network of cultural values (Hermans and Kempen, 1998). This grid is based on common features between different societies that interact with the local cultural background of the societies, ultimately leading to a cultural transformation with high coherence between cultural fields. Others focus on the fact that the changes that have accompanied globalization have failed to break the "resilience" of traditional values. DiMaggio (1994) argues that the resistance of traditional values to change stems from the fact that these values are independent of economic change.

Aging is another cause of incremental changes in the cultural background of different societies in recent decades, a trend which is observed in all societies regardless of their level of economic development. This trend is a result of technological developments in recent decades which have increased life expectancy and years of healthy living and have significantly reduced mortality rates, leading to a significant increase in the number of people over 60-year-old in societies (United Nations, 2017). Clearly, the characteristics of each dominant age group in a society have a relative influence on the cultural background. While the greatest changes in an individual's personality occur during adolescence (Borghans et al., 2008), significant changes in personality traits occur - albeit to a lesser extent - later in life. As individuals grow older, they become more emotionally stable personalities (Roberts et al., 2006). At the same time, behavior associated with openness to new experiences is something that increases at younger ages and decreases at older ages (Roberts et al., 2006). As people get older, they tend to become more "shortsighted" in the sense that they appear more present-oriented while not showing much interest in future orientation. In addition, the elderly are considered more politically active, now forming the bulk of the electorate and relying more on traditional and materialistic values. This has an impact on the election results. At the same time, they are becoming more supportive of trends such as populism (Norris and Inglehart 2016, 2019, Rodrik 2019), thus contradicting the shift observed since 1970 through which the cultural values are transformed from traditional/materialistic to post-materialistic (cultural backlash hypothesis of Norris and Inglehart (2019)).

2.1.3. The silent revolution of social behaviors

A case of gradual change of cultural background concerns developments that have taken place in recent decades, mainly in the developed economies of the western world. It is a "silent revolution" of social behaviors (Inglehart 1990) that Norris and Inglehart (2019) call cultural backlash and is based on developments such as generational replacement, increased access to higher education, urbanization, increasing gender equality and increasing national diversity.

Norris and Inglehart (2019) identify the existence of four broader generations with the latter coming to replace the first. These are: a) those who were born between 1900 and 1945 and lived through the First and Second World Wars and the Great Depression of 1929, b) those born between 1946 and 1964 who are essentially the post-war generation that lived the growing prosperity and expansion of the welfare state (called the Baby Boomers), c) those born between 1965 and 1979 and lived the period of sexual liberation and student protest (called Generation X), and d) those born between 1980 and 1996 who grew up in the era of neoliberal economics and globalization (called the Millennials). Intergenerational differences arise from historical experiences during the period in which the birth took place, something that has been established in the attitudes and values of individuals. Giuliano and Spilimbergo (2014) examine how the great macroeconomic shocks that one has experienced in childhood, affect one's personal choices and individual characteristics. They conclude that these situations shape individuals' motivations and general attitudes toward life. As they take place at an age when the human personality is fermenting and seeking stimuli from its wider environment, these situations affect human behavior through the subconscious. They conclude that people who grow up during a recession tend to support greater state redistribution and

believe that luck is more important than trying to determine financial success in life. Every day, every society loses some members of old generations and gains some new members from the new generations with this whole process leading to a transformation of the attitudes and behaviors of the whole society, which takes place gradually over time.

Moreover, in recent decades, there has been a very significant increase in participation in higher education in Western societies, resulting in a shift in societal attitudes to more liberal views. Globally, enrollment in higher education has tripled since 1970 (Norris and Inglehart, 2019). Even more important is the increase in women's participation in education, which quadrupled during this period. Globalization has also significantly guided these developments by increasing the demand for higher education knowledge and by increasing the mobility of populations.

Another phenomenon that has led to a change in the attitudes of societies is the fact that in many countries around the world and especially in Western economies, there has been a process of urbanization in recent decades. The populations not only are concentrated in cities without appropriate infrastructure, but also multiply rapidly. This trend has led to an increase in national diversity in the big cities, which has led to a breakdown of existing cultural values and a shift to new combinations of cultural values (Norris and Inglehart, 2019). The upward trend in the national diversity of post-industrial societies has been exacerbated in recent decades by the significant increase in the influx of migrants into societies. The younger generations also tend to get used to living in multicultural societies.

In addition, in recent decades there have been significant upheavals in gender relations, due to the achievements of science, the new philosophical and ideological currents of the West and the ongoing social struggles for the protection of basic human rights of women. As more and more women enter the labor market, significant initiatives have been taken to promote gender equality.

Therefore, Norris and Inglehart (2019) note that for more than 40 years, conditions have been made that led to existential security so that the priority of societies is not so much to secure a safe and sure future but the prevalence of other values such as free choice and expression. Thus, the conditions described above have gradually reduced the size of social sectors adhering to social conservatism and traditional values, while expanding parts of the population that support socially liberal attitudes and post-materialist values. This trend seems to be observed in high-income countries and not in developing economies.

The rise of post-materialist values is part of a much broader cultural shift, with greater emphasis on environmental protection, peace movements, sexual liberation, support for democracy and human rights, gender equality, respect for human rights, homosexuality, the protection of people with disabilities and minorities and international cooperation. This shift is also linked to moving away from prioritizing issues related to economic outcomes and participation in political processes, such as voting, joining political parties, trade unions, and voluntary unions, which have given way in demonstrations and activism, especially among the younger generation.

As Inglehart (1988) points out, the emergence of post-materialist values is associated with lower rates of economic growth. The emergence of Protestantism and Protestant ethics in traditional societies led to the emergence of capitalism accompanied by rapid economic growth, wealth, and abundance. This, in turn, has led to increased security for the future and a shift to more post-materialist values and less to traditional/ materialistic values. This is also the reason why, when the economic and social system is stable, there is an increase in the tendency towards post-materialist values, and lower rates of economic growth emerge (Inglehart 1988).

Thus, this whole process of social change and the shift to more post-materialist values for younger generations pushes older generations to react to this shift that is not in line with the traditional values in which they have been nurtured and matured. Similarly, the urbanization of societies also pushes traditional provincial societies to respond to the high concentration of power and national diversity (Wilkinson 2019). The result of these reactions is to enhance reactive currents to maintain or improve traditional values. One way to do this is through the power of the vote and, more specifically, through support for political parties that have their basis in authoritarian regimes. The result of all this reaction is the increase in voters supporting populist parties.[1] Norris and Inglehart (2019) report that while traditionalists may be less in numbers, they are very active in the elections and generally very politically active. This whole process inevitably leads to more comprehensive changes in the cultural background of societies.

2.2. Sudden changes

But there are also cases where the change of cultural background occurs after an external shock or a cultural shock and can be described as sudden.

External shocks cause serious and critical changes in the cultural background. Therefore, an economic shock like an economic crisis tends to "spawn" or accelerate the cultural changes which, once accepted because of the crisis, tend to become permanent. Changes of this type can cause psychological stress on individuals (Eschbach et al., 2001) affecting their psychological adaptation to new conditions and can be - depending on the intensity of change - a strong shock to the context of cultural values that characterizes them. The result is a change in cultural background, which is usually much faster than the incremental change described above. An example is the recent financial crisis of 2008, which has affected most economies worldwide. Besides economic effects, the economic crisis affects societies and more specifically the cultural background and personal characteristics of members of societies (Magee et al., 2013). The result of the global financial crisis was a significant economic impact on economic actors that led to significant stress and psychological

[1] Another perspective on the rise of the populist wave is that of economic insecurity, which explains populism as a product of rising income inequality, a sense of injustice on the global market's losers, dissatisfaction with the dominant center-left parties, and a loss of faith in the ability of the dominant parties to respond in those issues. If this is the case, then populism should be supported by those who feel economically insecure, such as unskilled labor, those who have not received higher education, the unemployed, people living in the province, pensioners and dependents from social transfers.

pressure (Eschbach et al., 2001; Petrakis 2011; Sargent-Cox et al., 2011). Proponents of the "Insecurity Hypothesis" claim that the economic stress, insecurity and austerity experienced by individuals as a result of the crisis have changed their cultural values and are responsible for the rise of the populist wave (Norris and Inglehart 2019; Rodrik 2019).

Besides, Oberg (1960) defined the term "cultural shock" as the stress that results from the loss of all known signs and symbols of social interaction. Weaver (1994) states that a cultural shock can result from the loss of well-known benchmarks, the disruption of interpersonal communications, or an identity crisis. A culture shock can be defined as a change that leads individuals and societies to face circumstances that are characterized by conditions different from their previous cultural "content" (Xia, 2009). The entry of a person into a society, characterized by different cultural background compared to his own, under the conditions of migration, is an example of cultural change (Oberg, 1960). This change leads immigrants not being able to understand the ideology and behavior of members of the new society and as a result they do not understand why these people behave in the way they behave and how they should behave themselves (Xia, 2009). Under these conditions, the individual is likely to suffer from psychological symptoms (depression, anxiety, etc.) (Hess, 1994; Mio, 1999). As these symptoms increase, the person does not feel free, making the process of adapting to the new situation difficult. In general, migration leads to privacy and introversion as it contains the key elements of group detachment and individual survival (Petrakis, 2014). Thus, one has to adapt to the new cultural environment characterized by different lifestyles, living conditions, and business practices (Zorlu and Hartog, 2005).

3. The role of cultural background on economic growth

Since the late 1960s, rational choice models based on economic variables have been the dominant mode of analysis in economic thought. This has led to the silencing of the role of the cultural background in the economic development and growth of societies. At the same time, there is a debate on whether the lack of data on cultural values that determine the cultural background and the simultaneous existence of economic variables have led to this shift or whether the role of the cultural background has been consciously exaggerated (Inglehart, 1988).

However, from the late 20th century and onwards, there is a gradual emergence of works in the literature that use empirical models to explain the effects of the cultural background on economic development and growth (Hofstede and Bond 1988; Granato et al., 1996; House et al., 2004; Alesina and Giuliano, 2015).

Cultural dimensions, according to Hofstede (1980), concern the basic characteristics of societies. The different performance of each country in each cultural dimension indicates that different societies treat these characteristics differently (Hofstede 1980). Using as dependent variable the growth rates between 1960 and 1970, Hofstede's (1980) study concludes that societies characterized by low uncertainty avoidance and low power distance usually achieve higher rates of economic growth. Hofstede's research (1980, 1991, Geert 2001) filled a significant gap in the field of transnational value benchmarking, presenting value characteristics that could be used to measure a society's cultural background.

Franke et al. (1991), regress Hofstede's cultural values in a sample of 18 countries with lagging economic growth for the periods 1965–1980 and 1980–1987. They conclude that cultural characteristics have the ability to explain more than 50% of the fluctuation rate of economic growth. Their sample includes four Western values and four Chinese values from the Chinese Values Survey (Hofstede and Bond, 1988).

Schwartz (1994) with his theory of cultural values seeks to determine a relationship between cultural background and important social phenomena. Schwartz's research shows that economic growth and development promotes autonomy and equity and suppresses hierarchy and group action. Also, he points out that cultural background influences growth as hierarchy and group integration stifle individuals' motivation and creativity. His-study found that investment at the international level was higher for societies with low scores on the variables of group integration and equity but also that harmony encourages international investment.

Inglehart (1997) identifies groups of countries sharing the same cultural values. Based on data from three WVS waves (1970–1971, 1981 and 1990) examines the relationship between cultural background and economic growth. He concludes that higher-income drives individuals to existential security in an easy way, which leads individuals to shift their priorities and values. This shift in priorities is mainly aimed at shifting to more post-materialist values (such as environmental protection, acceptance of homosexuality, quality of life issues, etc.). The fact that in such a context, societies are not performance-oriented leads to lower growth rates.

The different social and political processes that shape the cultural background of each society guide the human behavior and character of all involved. These processes are different for each society, resulting in the development of different social structures and therefore a different cultural background between societies (Greif, 1994). As Greif (1994) points out, differences in the cultural background between countries may ultimately have an impact on wealth distribution, while at the same time, economic growth is related to cultural stereotypes and behaviours.

One way of capturing the relationship between cultural background and growth is approached by some scholars through political science and specifically through the term "political culture" (Putnam, 1993; Inglehart, 1990). To this end, Jackman and Miller (1996) explore the relationship between political culture and a range of macroeconomic variables. Following the logic of Inglehart (1990) on how to describe political culture, the authors conclude that the relationship between political culture and growth is quite weak. Their conclusions contradict the findings of Inglehart (1990). The criticism they received of their findings is based on the fact that their sample consists only of the most advanced countries and that the model used in empirical research is a limited form of the magnification model. Therefore, the possibility that satisfactory control variables have been omitted cannot be ruled out (Swank, 1996; Kapás, 2017).

Moreover, Granato et al. (1996) following an assessment model such as that of Jackman and Miller (1996), examine the explanatory power of the endogenous magnification model and compare it with two cultural values that express motivational factors:

motivation for achievement and meta-materialistic values. Based on WVS data, they construct an indicator to measure the extent to which the incentive for achievement has an impact on economic growth. Their study shows that, in a sample of 25 countries, economic growth is influenced both by economic factors and the map of the cultural values of the society, playing a complementary role, as the combination of the two concepts is capable of interpreting aspects of growth that each concept fails to do separately.

Marini (2004) based on the study of Granato et al. (1996) divides the evolution of economies into three phases through which they go through in order to reach economic growth. The first period is characterized by traditional structures of the economy with obedience, belief in religion and tolerance dominating the grid of values of society. The second period is characterized by the need for individual progress and generalized trust. Finally, in the third period the values that seem to prevail are imagination and selflessness. Marini (2004) concludes that there is a negative relationship between economic growth and traditional values (first period) while a positive relationship is associated with values such as independence, austerity and diligence. Finally, the values prevailing in the third period do not seem to have a statistically significant relationship with economic development.

More recently, Bützer et al. (2013) investigate the question of whether culture affects the emergence of macroeconomic imbalances for 65 advanced and emerging countries. Using decade-level data from the World Values Survey (WVS) and the European Values Study (EVS) for three decades after 1980. They measure culture using the first component of a Principal Component Analysis including the following cultural values: interpersonal trust, honesty, obedience, confidence in individual self-determination, competition affinity, work ethic, importance attached to thrift. They find robust empirical evidence for a negative and significant relationship between trust and macroeconomic imbalances which may therefore partly reflect underlying het- erogeneity in cultural background.

Additionally, the transition of a society from low-income to high-income countries is influenced by cultural values (Paldam, 2002). Paldam (2002) tries to find out to what extent cultural values influence the transition path of each society. Thus, countries with the same grid of "core cultural values" follow the same path of transition. Focusing on the level of societal corruption, Paldam (2002) argues that cultural background is a small explanatory factor as countries within the same cultural space have similar levels of GDP per capita.

Tabellini (2008, 2010) attempts to capture the cultural background through four cultural values (trust, respect, control of life, and obedience) to study its interconnection with economic growth. These cultural values are outlined through answers to four relevant WVS questions. He concludes that the cultural background is how institutions influence economic outcomes, as well as that the cultural background is shaped by historical events and factors (such as political institutions and the level of illiteracy) as well as the broader prevailing conditions

Another crucial issue, which has been examined in the relevant literature, concerns the way in which economic results are affected by the degree of collectivity of societies (Triandis, 1995). Triandis (1995) based on the level of individualism and collectivity of societies examines their impact on the economic result. The high levels of collectivism when combined with traditional societies, create obstacles to economic growth. Collectivism emphasizes to the functioning of the individual within the group, removing the initiative and freedom of expression. On the contrary, societies that are characterized by individualism tend to boost economic growth and push the individual to develop the entrepreneurial activity.

De Jong (2009) in his analysis offers explanations of how cultural backgrounds affect institutions and economic outcomes. The results of his empirical analysis confirm the negative relationship between GDP growth rate and uncertainty. His-analysis concludes that cultural values shape the way societies are organized, without this necessarily meaning that they also affect economic outcomes.

Williamson (2009) following the definition of cultural background as defined by Tabellini (2008) and institutional background as defined by Glaeser et al. (2004) calculates the difference between formal (economic, political, social institutions) and informal (cultural background) institutions and their impact on the economic development of countries. It differs -in terms of the results of the analysis- from Tabellini as it identifies a significant influence of informal institutions on economic development: strong informal institutions (cultural background) are critical determinants of economic growth irrespective of the power of formal institutions.

Bucci and Serge (2011) conclude that the role of cultural background in economic growth is particularly critical if human capital complementarity is important. By creating a binary model of endogenous growth, using two different types of capital (human and cultural capital), they argue that investing in cultural background can only affect economic growth in the long run through the complementarity between these two forms of capital accumulation.

Gorodnichenko and Roland (2011) using data from WVS, Hofstede and Schwartz to capture cultural background study their effect on per capita output. They conclude that the cultural value of "individualism" is always statistically significant, in contrast to other cultural values. "Integration" is important but has a negative effect. "Emotional autonomy", "spiritual autonomy" and "equality" are both positively statistically significant. Gorodnichenko and Roland (2011) conclude that there is a strong causal effect of the cultural background on long-term economic growth and the level of innovation. They find that a more individualistic cultural background is more innovative and, therefore, conducive to economic growth.

In addition, Gray (1996) states that cultural background determines economic growth, since there is an interrelation between culture and the ability of the Government to institute growth-oriented policies in addition to the direct effects of cultural values on recognized economic forces.

Moreover, in the relevant literature, trust is considered to be a concept identical to the cultural background, as well as the most critical dimension of social capital (Putnam, 1993; Fukuyama, 1995; Knack and Keefer, 1997). The definition of the concept of social capital was extended by Putnam (1993), who essentially included in it the concept of trust. Putman (1993) argues that differences in social structures between different geographical areas may explain differences in countries' economic performance. When social structures are characterized as horizontal and based on common values but also on trust, then social capital is greater, as are economic results. Fukuyama (1995) highlights the direct relationship of trust with economic development, while Horvath (2013) suggests that trust is an important driver of long-term growth.

Zak and Knack (2001) examine the intrinsic relationship between trust and economic growth. They conclude that an increase in trust by fifteen percentage points is expected to increase economic growth by one percentage point. In addition, they conclude that much of the effect of formal institutions and population heterogeneity on economic growth is due to the effect of trust. In this way, Zak and Knack (2001) recognize trust not only as a factor directly affecting economic growth but also as a channel leading to economic growth.

Beugelsdijk et al. (2005) focusing on the relationship between social capital and economic growth and why different parts of Europe are different, concentrate on the role of trust and the role of citizen engagement with the public. They conclude, in full correlation with much of the literature, that after checking their results based on GDP per capita at the beginning of the period under review, social capital is positively related to the economic growth of economies.

Also, many scholars have documented essential examples of how cultural values are shaped by religion and which is the interconnection of religion with economic growth (Habibi, 1989). Weber (1958; Max 2001 [1930]) argues that Protestantism played a decisive role in the development of capitalism and the subsequent rapid economic development of Western societies (Weber 1958). In addition, he stresses that the behavior of the modern individual has been defined by the influence of Protestantism, while at the same time, Calvinism has emphasized individuality and the empowerment of personal potentials and initiatives. Capitalism is seen not only as a result of the structure and evolution of Western world societies but also as a result of Calvinism as it has led to the liberation from the traditional ethics on the acquisition of goods (Tayeb 2000). Moreover, Barro and McCleary (2003) note that faith in hell seems to contribute positively to economic growth, while churching appears to harm economic development, which is explained by the opportunity cost of churching. Renneboog and Spaenjers (2012) point out that there are considerable differences in economic attitudes and financial decisions between religious and non-religious households.

Moreover, the cultural background has indirect effects on economic growth as well, since it is highly correlated with several economic issues that affect economic growth. More precisely, culture is regarded a potential determinant of market reform adoption (Tarabar, 2017), and affects the manner in which a society regulates the entry of new firms (Davis and Williamson, 2016), institutional quality (Licht et al., 2007; Davis and Abdurazokzoda 2016), dividend payouts (Fidrmuc and Jacob 2010), human capital accumulation (van Hoorn (2019), interfirm relations such as competition and cooperation and intrafirm relations such as organizational behavior (Mark 1993) and the level of intragenerational redistribution in public pension plans (Rivera-Rozoa et al., 2018).

The present paper adds on the discussion about the effects of traditional/ materialistic or post-materialistic cultural background on GDP growth. The assumption under consideration is based on the conclusion of Inglehart (1988) which this paper examines to satisfy using recent data. Thus, the basic assumption examined is whether traditional/ materialistic values lead to higher GDP growth, while when post-materialistic values prevail less emphasis is placed on economic results and lower GDP growth rates are observed.

4. Data and methodology

The cultural background change during the last decades and the interconnection between cultural background and economic growth is attempted to be explored through the influence of several cultural values. A selective selection of cultural values is realized (generalized trust, respect, independence, work ethic, competition affinity and trust in political institutions) to express the cultural background of the economies that make up the sample under analysis, based on significant references (Inglehart, 1988; Tabellini, 2010; Bützer et al., 2013; Kostis et al., 2018). These cultural values are complemented by the role of religion since it is considered an essential source of emerging cultural values and attitudes (Tayeb, 2000; Walker, 2008). The selection of these certain cultural values gives as the opportunity to characterize the resulting overall cultural background as traditional/materialistic or post-materialistic based on the discussion realized by Inglehart and Baker (2000).

The following WVS and EVS question is used to measure the variable "generalized trust": "*Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?*" The level of trust in each country is measured as the percentage of respondents who answered that "most people can be trusted." It should be noted that this paper uses generalized interpersonal trust, which clearly differs from the personalized trust. Trust is closely linked to trustworthiness. If a society expresses respect and tolerance among individuals, generalized trust prevails (Banfield, 1958, Tabelini, 2008), and therefore trust is perceived as "generalized interpersonal trust." Thus, in this paper, the variable generalized trust is complemented by the variable "respect". The following WVS and EVS questions are used to measure this variable: "*Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?*". Respect is derived as the percentage of respondents who answered, "*tolerance and respect for other people.*" Inglehart and Baker (2000) cite as traditional values societies to believe that respect is not one of the values they should teach their children, and say that the opposite characterizes post-materialistic values.

To measure the variable "independence," the following WVS question -supplemented by EVS- is used: "*Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?*" The variable "independence" is defined as the percentage of respondents reporting "independence" as being of significant quality. This variable is considered as a value that contributes to sketching the cultural background of a society because it adds to the role of individualism in society (Tabellini, 2010). Inglehart and Baker (2000) cite as traditional value those who say that obedience rather than independence is an important quality to teach their children. As they note, the opposite is true in post-materialistic societies.

The variable "work ethic" emerges as the percentage of respondents that answer "hard work" to the question "*which quality they consider particularly important to teach their children*". Work ethic is intended to capture individuals' internal motivation to work (Phelps, 2006). In societies where work is central to individuals' lives and where their work distinguishes individuals, they are expected to be more hard-working. When there is a work ethic, higher productivity should be expected. Inglehart and Baker (2000) support that societies in which work plays an important role in their lives, believe that hard work should be taught to their children as

an important quality, and respond that rest is not important for their lives, should be treated as traditional societies.

The variable "competition affinity" emerges as the respondents' answers to the question "*how would you rate your opinion, on a scale of 1 to 10, from competition being good to harmful competition*" and answering that competition is good. A population with a positive attitude towards competition should be more likely to favor competition, and thus market liberalization, in product and labor markets. Inglehart and Baker (2000) cite as traditional values the following and which one might claim to be values that enhance competition: priority in economic security rather than self-expression and quality of life, great emphasis on the exploitation of new technologies, emphasis on wages and safe work instead of working with people who thank them, men should be more likely to work than women, scientific discoveries that help the humanity, and should not be given help from richer to poorer economies.

In order to measure "religion," the percentage of respondents who said that faith is important for their lives, is used. Inglehart and Baker (2000) place great emphasis on the role of religion in traditional societies, as they consider traditional societies to: believe that God and religion are important in their lives, believe that faith should be taught to their children as important value, believe in heaven and hell, go to church and trust the church as an institution, and respond that their religion gives them strength and comfort.

The variable "trust in political institutions" is obtained as the first principal component of a PCA based in the percentage of respondents who said they (very much) trust each of the following three political institutions: the national parliament, the national government, and the political parties. From the PCA, the first component has an eigenvalue of 2.58 and interprets 86.08% of the variance. The principal component "trust in political institutions" is positively shaped by all three variables. Norris and Inglehart (2019) place great emphasis on the attitude of societies towards political institutions, as they consider it to be a critical variable for the rise of populism. Specifically, they note that various factors lead to a process of changing the cultural background of societies, with the emphasis being placed from traditional to post-materialistic values, giving room for the development of attitudes toward this change expressed by populist streams. Indeed, they note that the rise of populist streams is because the large mass of voters is made up of people who are characterized by traditional values and who oppose this change in societies. In contrast, correspondingly, the new generations who describe themselves as post-materialists do not emphasize on political subjects and the exercise of their political rights.

Table 1 presents the questions through which each cultural value is captured, as well as the characterization of each value as traditional/materialistic or post-materialistic based on Inglehart and Baker (2000) and other empirical works that use those cultural values.

A Principal Component Analysis (PCA) is used to reduce the number of independent variables but also to ensure that the results are not sensitive to the way the variables are constructed. Since the cultural background variable is an index of individual cultural characteristics, one should not concentrate on the extent to which individual elements have an independent influence on economic growth. Instead, the cultural background variable should be interpreted as an overall measure.

In order to investigate the impact of cultural background on economic growth, an unbalanced panel of 34 OECD countries is used. As Pryor (2008) concludes distinct clusters of general cultural values found in various OECD countries match the particular economic systems of these countries. The analysis period covers the period from 1981 to 2019 and is broken into seven (7) sub-periods based on the World Value Survey (WVS) waves: 1981–1984, 1990–1994, 1995–1998, 1999–2004, 2005–2009, 2010–2014, while for the period 2017–2019 the data are derived from the European Value Study (EVS) (2nd release, July 2019). Data from EVS (EVS 1981, 1990, 1999, 2008) complement the sample of countries and the other six waves of WVS, as well. The dataset focuses on OECD countries in order to have a homogeneous dataset of countries which are considered to be developed economies. This is the case in the analysis made by

Table 1
Definitions of cultural values.

Cultural Value	Responses to the following question	Traditional vs Post-Materialism based on Inglehart and Baker (2000)	Other Sources using this cultural value
Generalized Trust	Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?	Post-Materialistic Value	Inglehart (1988) Tabellini (2008, 2010) Bützer et al. (2013) Kostis et al. (2018)
Respect	Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?.Respect.	Post-Materialistic Value	Tabellini (2008, 2010)
Independence	Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Independence.	Post-Materialistic Value	Tabellini (2008, 2010) Bützer et al. (2013) Kostis et al. (2018)
Work Ethic	Which quality do you consider particularly important to teach to your children? Hard Work	Traditional Value	Bützer et al. (2013) Kostis et al. (2018)
Competition Affinity	How would you rate your opinion, on a scale of 1 to 10, from competition being good to harmful competition?	Traditional Value	Bützer et al. (2013) Kostis et al. (2018)
Religion	Is faith important for your life?	Traditional Value	Weber (1958, Max 2001) (1930), Inglehart (1988), Putnam (1993), Harrison and Huntington (2000)
Trust in Political Institutions	Percentage of respondents who said they (very much) trust each of the following three political institutions: the national parliament, the national government, and the political parties.	Traditional Value	Inglehart 1988, Inglehart και Baker (2000)

Inglehart and Baker (2000) and by Norris and Inglehart (2019), according to which the developed economies of the Western world have seen a shift in their societies from traditional to post-materialistic values.

Thus, the final set of economies under consideration consists of an unbalanced group of 34 OECD countries. In order to estimate the relationship between cultural background and economic growth, the following estimation equation is used:

$$GDPgrowth_{it} = \alpha_i + \beta * GDPgrowth_{i(t-1)} + \gamma * CulturalBackground_{it} + \delta * Z_{it} + \lambda_t + u_{it} \quad (1)$$

where i represents each economy of the sample under analysis ($N_{max} = 34$) and t the corresponding wave ($T_{max} = 7$). The dependent variable *GDP growth* refers to the annual real GDP growth rate and is a measure of economic growth. As a first independent variable the GDP growth rate with a lag is used. *Cultural Background* is a variable that expresses the cultural background of societies, Z is a vector of control variables, a_i is a constant term that represents some country-specific fixed effects intended to record the influence of unobserved and time-varying heterogeneity across countries, and λ_t is a dummy-variable for each wave, which controls for specific effects that are common across countries during each wave. Greek letters β, γ and δ denote the estimators of the independent variables.

Eq. (1) is estimated using the Least Squares Dummy Variable Correction (LSDVC) method developed by Bruno (2005a, 2005b) as an extension of the bias approximation formula of Bun and Kiviet (2003) in order to accommodate short, unbalanced panels with a strictly exogenous selection rule. This is a dynamic method used in short unbalanced and panels used extensively in the literature (Bogliacino et al., 2012; Flannery and Hankins, 2013) which is evaluated via Monte Carlo experiments. According to Bruno (2005a) this method is preferred from GMM estimators when the number of observations is small and the panel dataset is severely unbalanced, while it also removes an approximated small sample bias from the FE estimator.

Moreover, the period under investigation is divided into two sub-periods checking the relationship between the cultural background and the GDP growth rate in those two sub-periods. The first subperiod covers the years from 1981 to 1998 and the second subperiod the years from 1999 to 2019. The total period of the analysis is braked in 1998 since Inglehart and Baker (2000) have already noticed a change in the cultural behaviours of the advanced economies of the Western world using data from the wave of 1995–1998 of the WVS.

The results of the estimation of Eq. (1) are subject to robustness analysis, following a series of tests:

(a) adding control variables to the analysis. It concerns the incorporation of various combinations of control variables into the analysis and observation on whether or not the effect of cultural background on GDP growth rate changes.
(b) using a different method of estimating results, both the entire period as well as the two sub-periods.

Thus, in addition to the LSDVC estimator, the Generalized Methods of Moments (GMM) enriched estimator (Arellano and Bond, 1991) is used. It is more suitable when N is large and T small and takes into account endogeneity and unobserved heterogeneity. The use of the GMM system improves the results obtained from the fixed effects technique since the GMM system increases the efficiency of estimators under additional conditions, that is, the presence of persistence (autocorrelation and other effects) over time (Alonso--Borrego and Arellano, 1996). The GMM difference (Arellano and Bond, 1991) addresses autocorrelation problems by using time-lagged internal variables as the right-hand side of the equation. The presence of endogeneity between the independent variables and the existence of a correlation between the error term and the lagged dependent variable obligates the use of instrumental variables.

The results obtained by this method are evaluated by applying the following tests: 1) The Hansen J test (Hansen and Singleton, 1982) of the orthogonality between the instruments and the residuals, which allows to check the validity of the tools used for regression through the comparison between the estimated moments and the sample moments (under the presence of heteroskedasticity or autocorrelation the result of the Sargan test (Sargan, 1958) is not strong), and 2) the Arellano and Bond test (Arellano and Bond, 1991) for the first and second-order serial correlation, which allows the null hypothesis of the absence of autocorrelation among residuals to be tested.

Moreover, the analysis is realized using a two-way fixed effects (FE) estimation approach as well, presented in an online appendix. This approach allows for economics-specific heterogeneity using a different constant term for each economy and can be estimated using the ordinary least squares (OLS) method. In addition, country specific clustered robust estimates of the standard errors are performed to check for autocorrelation and heteroskedasticity.

The data used in the analysis are derived from the following sources: Real GDP growth rates are obtained from the World Economic Outlook of the International Monetary Fund (IMF). Real GDP growth rates are converted from yearly data to averages for each wave. Most of the data that are related to the cultural background is collected by the WVS supplemented by data from the EVS, for relevant questions on the corresponding waves. In particular, for the measurement of the cultural background, a comprehensive measure is used, which emerges as the first principal component of a Principal Component Analysis (PCA) of a set of cultural values of the societies. The cultural values that make up the cultural background are generalized trust, independence, respect, work ethic, competition affinity, religion, and trust in political institutions. The variable trust in political institutions is derived as the first principal component of a PCA as well, using questions selected by the WVS and the EVS to express the variable.

According to previous studies on the impact of culture on macroeconomic outcomes (Knack and Keefer, 1997; Bützer et al., 2013; Bjørnskov and Meon, 2015), a series of control variables are also included in the analysis. These are the logarithm of real GDP per capita as a measure of income level (Knack and Keefer, 1997; Knack, 2002, Roth 2009), the trade openness (Bjørnskov and Meon, 2015; Barone and Mocetti, 2016), the unemployment rate and inflation level as a measure of short-term macroeconomic developments (Barone and Mocetti, 2016), the logarithm of the number of patents as a measure of the quality of research and development processes (Westmore, 2013), the spending on education and the public debt as notions that reflect the public sector (Bjørnskov and Meon, 2015),

the regulatory quality and the political stability as measures of institutional quality (Marino et al., 2016), the trust in the judging system as a measure of trust in the institutions of society (Tabellini, 2010; Bützer et al., 2013; Bjørnskov and Meon, 2015; Kaasa, 2016), and the population density as a measure of the wider living conditions in the societies under study (Yegorov, 2015).

All data regarding the control variables are derived from the World Bank, excluding the level of real GDP per capita obtained from the World Economic Outlook Database of the IMF, the trust in institutions obtained from the WVS.

Table 2 presents descriptive statistics for the variables included in the analysis.

5. Empirical results

Based on the variables listed above, Table 3 presents the PCA for the "Cultural Background" variable. From the PCA the first principal component is used that has an eigenvalue of 2.91 and a variance of 41,66%.

The cultural background is strongly correlated with six of the original variables (those values that are greater than 0.3). It increases with increasing generalized trust, independence, and respect scores, and it decreases with increasing work ethic, competition affinity, and religion scores (the effect of trust on political institutions is small). Based on the theoretical background of Inglehart and Baker's (2000) analysis, how the variable cultural background is shaped leads to the conclusion that for the period of investigation the cultural background could be characterized as post-materialistic since the cultural values that positively form it are values that play an essential role in post-materialist societies. The negative shaping values are values that are important in traditional/materialistic societies.

So, based on the analysis by Inglehart (1997) and Norris and Inglehart (2019), one should expect that when post-materialist cultural values prevail, this leads to a lower rate of economic growth as societies have already secured their livelihoods and are now turning to post-materialistic values, not paying much attention to issues related to economic outcomes. Thus, a negative relationship between the cultural background and the GDP growth rate should be expected.

A scatter plot regarding the relationship between the cultural background and the real GDP growth rate is shown in Fig. 1.

The above figure shows a first indication of the relationship between the two variables, which is expected to be negative for the sample of 34 OECD countries over the last four decades (1981–2019).

Eq. (1) is estimated using the LSDVC, in order to estimate more precisely the relationship between the two sizes. The results are presented in Table 4.

The effect of the cultural background on GDP growth is negative and statistically significant in Regression (1). The data show a negative and statistically significant relationship between the cultural background and the real GDP growth rate.

Thus, the cultural background during the period 1981–2019, has a negative and statistically significant effect on GDP growth rate. This fact means that the more societies tend to post-materialistic values, the lower the GDP growth rate should be expected to be.[2] Indeed, in the overall period the cultural background is characterized as post-materialistic, based on the cultural values that configure it. The negative role of the cultural background on economic growth means that the more post-materialist values prevail in a society, the lower (either slower or negative) the GDP growth rate should be expected (Inglehart 1988).

In order to perform a robustness test, the estimates of Eq. (1) are expanded by adding various combinations of control variables to the analysis (Table 4, regressions (2) to (7)). It is observed that in all cases, the effect of the "post-materialistic" cultural background on the GDP growth rate remains negative, confirming the result from regression (1).

Moreover, the total study period (1981–2019) is divided into two sub-periods: the period from 1981 to 1998 and the period from 1999 to 2019. This is beneficial for the analysis and requires a PCA for each sub-period to obtain the cultural background configured in each case.

Table 5 presents the results from the PCA for the variable "cultural background" for the two sub-periods of analysis.

The principal component representing cultural background of the OECD countries for the sub-period from 1981 up to 1998 is strongly correlated with six of the original variables (those values that are greater than 0.3). It increases with increasing the competition, work ethic and religion scores (which are traditional/materialistic variables) and decreases with increasing independence, generalized trust, and respect scores (which are post-materialistic variables). Thus, it is a principal component that is characterized as traditional/materialistic.

Moreover, the principal component representing cultural background for the sub-period from 1999 up to 2019 is strongly correlated with five of the original variables (those values that are greater than 0.3). It increases with increasing independence, generalized trust and respect scores (which are post-materialistic variables) and decreases with increasing competition, work ethic, and religion scores (which are traditional/materialistic variables). Thus, it is a principal component that is characterized as post-materialistic.

The characterization of the cultural background shifts from traditional/ materialistic in the period 1981–1998 to post-materialistic in the period 1999–2019. The way the two principal components are configured, confirms the analysis by Norris and Inglehart (2019) that societies have shifted from traditional to post-materialistic values in the last decades.

Then, Eq. (1) is estimated for each subperiod using the LSDVC. Table 6 presents the results.

For the first period of analysis, from 1981 to 1998, when the cultural background is characterized as traditional, the impact of the cultural background is positive on GDP growth. This is in full agreement with the analysis by Inglehart (1988), according to which when traditional values prevail, this leads to high growth rates and the creation of wealth and abundance in societies.

For the second period of analysis, from 1999 to 2019, when the cultural background is described as post-materialistic, the impact of

[2] It should be noted that this conclusion does not mean that the growth rate becomes negative. It is more likely that, as Inglehart and Baker (2000) note, the rate of growth becomes slower.

Table 2
Descriptive statistics.

	N	Mean	St. Dev.	Min	Max
GDP growth	238	5.16	2.34	−1.51	12.81
Culture	67	0.00	1.71	−4.84	3.34
Independence	166	52.92	19.92	11.90	90.00
Competition affinity	143	19.72	8.96	3.70	55.20
Generalized trust	168	35.65	15.83	4.80	77.40
Trust in political institutions	92	0.00	1.61	−3.47	3.65
Trust in Domestic Parliament	150	39.86	15.28	6.00	84.30
Trust in Government	96	37.81	13.64	7.70	68.20
Trust in Political Parties	95	20.91	9.39	3.40	50.20
Work Ethic	165	42.66	26.51	2.10	92.00
Religion	80	24.07	18.26	4.90	83.30
Respect	167	71.45	14.01	24.90	93.70
Unemployment Rate	227	7.62	3.94	0.17	23.31
Trade Openness	227	86.37	52.96	17.44	414.17
Education expenditure	209	28.19	77.88	1.13	529.65
Trust in Institutions	159	11.63	7.34	0.20	39.70
GDP per capita	230	10.28	0.47	8.72	11.46
Patents	229	7.34	2.23	2.76	12.82
Inflation	230	7.67	19.15	−0.49	189.16
Regulatory quality	170	1.28	0.42	0.04	2.05
Political Stability	170	0.77	0.62	−1.80	1.70
Population density	232	131.82	127.60	1.99	528.79
Debt	199	57.84	37.79	4.83	236.55

Table 3
Forming the variable "Cultural Background.".

Independence	0.42
Competition affinity	−0.36
Generalized trust	0.47
Trust in political institutions	−0.01
Work ethic	−0.42
Religion	−0.37
Respect	0.38
Eigenvalue	2.91
Variance	41.66%

Note: We define as significant in configuring cultural background those variables that score above 0.3 or below −0.3.

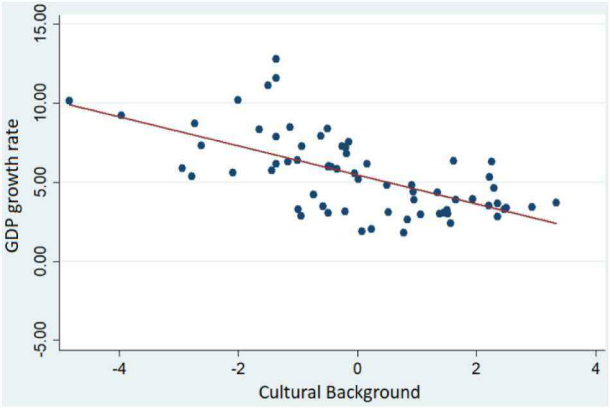

Fig. 1. Scatter plot regarding the relationship between culture and GDP growth rate.

the cultural background is negative on GDP growth. This is in full agreement with the analysis made by Inglehart (1988), as well, since they suggest that when traditional/materialistic values are already dominant which leads to high growth rates and the assurance of their existential certainty and viability, then societies turn to post-materialist values that do not emphasize on economic results and as a consequence the GDP growth rate decreases.

Table 4
The effects of cultural background on GDP growth rate (LSDVC).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cultural background	−1.32***	−0.72***	−1.30***	−1.12***	−1.03***	−0.45*	−0.73***
	(−5.57)	(−3.32)	(−4.06)	(−3.16)	(−3.85)	(−1.61)	(−2.32)
GDP growth rate (−1)	0.99***	0.61***	0.73***	0.64***	1.07***	0.52***	0.53***
	(4.14)	(5.84)	(5.41)	(3.98)	(2.22)	(4.46)	(3.58)
GDP per capita		−3.37***				−5.38***	−0.73***
		(−5.02)				(−6.53)	(3.14)
Population density			−0.01	0.01		0.01	0.02
			(0.05)	(0.39)		(0.59)	(0.98)
Education expenditure		0.01			0.01	−0.01	−0.01
		(0.41)			(0.38)	(0.57)	(−0.19)
Regulatory quality					0.42	2.43***	
					(0.43)	(2.56)	
Inflation			0.01	0.05*		0.02	0.02
			(0.71)	(1.61)		(0.90)	(0.34)
Trust in institutions			−0.03	−0.04		−0.06*	−0.03
			(−0.99)	(−0.85)		(−1.82)	(−0.79)
Debt				−0.01			−0.01
				(−0.75)			(−0.22)
Trade openness					−0.03		0.01
					(−2.89)		(0.54)
Unemployment					0.07		
					(1.04)		
Political stability				1.36	−0.03		0.06
				(1.14)	(−0.04)		(0.06)
Patents						0.29	0.46
						(0.60)	(0.62)
Root MSE	0.92	0.94	0.83	0.75	1.46	0.71	0.79

Notes: The brackets show the z-scores. The estimator used in the analysis is the Anderson-Hsiao. * and *** denote statistical significance at 10% and 1% significance level, respectively. Each column represents a separate regression. Root Mean Square Deviation (Root MSD) is a measure of the differences between the values predicted by the LSDVC and the values observed.

Table 5
Forming the variable "cultural background" in the two sub-periods.

	Traditional / Materialistic Cultural Background 1981–1998	Post-Materialistic Cultural Background 1999–2019
Independence	−0.43	0.40
Competition Affinity	0.45	−0.24
Generalized Trust	−0.47	0.48
Trust in Political Institutions	0.13	0.06
Work Ethic	0.40	−0.44
Religion	0.32	−0.44
Respect	−0.30	0.38
Eigenvalue	2.79	2.93
Variance	39.98%	41.88%

Table 6
Cultural background and its effect on GDP growth rate for the two sub-periods of analysis (LSDVC).

		Dependent Variable: GDP growth rate 1981–1998 (8)	Dependent Variable: GDP growth rate 1999–2019 (9)
1981 - 1998	Traditional Cultural Background	0.28**	
		(2.04)	
	GDP growth rate (−1)	1.38***	
		(7.55)	
1999 - 2019	Post-Materialistic Cultural		−0.74***
	Background		(−2.78)
	GDP growth rate (−1)		0.34***
			(4.42)
Root MSE		0.23	0.52

Notes: The brackets show the z-scores. The estimator used in the analysis is the Anderson-Hsiao.
** and *** denote statistical significance at 5% and 1% significance level, respectively. Each column represents a separate regression. Root Mean Square Deviation (Root MSD) is a measure of the differences between the values predicted by the LSDVC and the values observed.

In order to perform a robustness analysis, a different estimation method of assessing the impact of the cultural background on GDP growth rates is used for the entire period as well as the two subperiods.

Table 7 (identical to Table 4) presents the effects of cultural background on GDP growth rate using the Arellano - Bond two stages GMM, for the overall period of analysis.

In the first column of Table 7, regression (10) presents the results of estimating Eq. (1) without the use of control variables. The Hansen test values in all cases are above 0.1, indicating the validity of the tools used in the regressions. At the same time, both the Arellano-Bond AR (1) and Arellano-Bond AR (2) tests are over 0.1 rejecting in that way the existence of autocorrelation in the residuals. The data show a negative and statistically significant relationship between the cultural background and the real GDP growth rate. This fact means that the more societies tend to post-materialistic values, the lower the GDP growth rate should be expected to be.[3] Moreover, this is the case under all combinations of control variables used in the analysis, in regressions from (11) to (16).

In addition, Table 8 (identical to Table 6) shows the impact of the cultural background on GDP growth rates for the two sub-periods under analysis, using the Arellano - Bond - two stages GMM approach.

The conclusions emerged repeat those of Table 5, since for the first period of analysis, from 1981 to 1998, when the cultural background is characterized as traditional, the impact of the cultural background is positive on GDP growth. For the second period of analysis, from 1999 to 2019, when the cultural background is described as post-materialistic, the impact of the cultural background is negative on GDP growth.

The Online Appendix presents the estimation of Eq. (1) using a two ways fixed effects panel data estimation method, for the overall period of analysis as well as for the two sub-periods. The conclusions emerged repeat those presented above.

6. Discussion and conclusions

Last decades, there is a decline in growth rates which may be attributed in economic factors such as slowdown in productivity growth, lower capacity utilization, declining labor force participation and rising inequality or in non-economic factors such as demographic developments. The role of culture in these developments is essential, since it is a critical factor affecting economic outcomes and economic decisions. The complexity of the cultural values that characterize a society either encourages or discourages its members from being oriented towards economic outcomes, thereby affecting economic growth. Thus, the factors presented above as critical for the decline in growth rates, may are closely connected to cultural background either as cause or effect.

The present paper, considering the cultural background as a moving institution, adds on the theoretical literature presenting the mechanisms through which cultural background is changed either incrementally or suddenly. The analysis concludes that cultural background has been transformed during last decades, since in the period from 1981 to 1998 traditional / materialistic values prevailed, while for the period from 1999 up to 2019 post-materialism values prevailed. This is in line with the cultural backlash hypothesis presented by Norris and Inglehart (2019). Moreover, the analysis considers cultural background and the way it had developed during last decades as a critical factor that lead to a decline in growth rates. This is proven considering the effects of culture on economic growth both over the entire period of analysis as well as in the subperiods before and after 1998. Confirming Inglehart (1988), when traditional / materialistic values prevail, economic growth is facilitated since emphasis is given in rapid economic growth, wealth, and abundance. When post-materialistic values prevail, economic growth slows down since less emphasis is given in economic outcomes and more emphasis on factors such as environmental protection, peace movements, sexual liberation, support for human rights, gender equality, etc.

The stability or the shift of society's cultural values over the years needs particular consideration for economic policy-makers. The extent to which societies focus on specific cultural values favours or discourages economic growth. However, what matters is whether these societies can differentiate the map of their dominant cultural values. This is undoubtedly a challenging but also a long process that depends on many factors (historical, geographical, psychological). Political actors and policy-makers cannot significantly change the cultural characteristics of their societies through their political actions and decisions, although last years there are developed ways through which economic policy can affect behaviors, for instance through nudging (Petrakis and Kostis 2020). But what they should not overlook is to take into account the cultural characteristics of their society before making decisions. Not all societies are ready to accept all economic policies, and each economic policy is expected to have different efficacy depending on the cultural characteristics of the society it is intended for. Thus, the findings of the empirical analysis send light on the discussion about the effectiveness of "one-size-fits-all" policies.

Besides, the conclusions of the analysis may be important for policymakers for some other reasons as well. In particular, the more societies are based on traditional values, the higher their growth rate should be expected. Of course, this does not mean that efforts should be made to focus on traditional/materialistic values. The shift from traditional to post-materialist values is a natural consequence when societies feel economic and existential security, thereby shifting to other (post-materialist) values. Another issue is that the rise of populism in recent years is fueled by traditional cultural values in the developed economies of the Western world. These values are found mainly in the older population -which comprises the majority of the active voters- who do not follow the trend of younger generations towards more post-materialist values (Rodrik 2019). However, this does not mean that the majority of the society is dominated by traditional cultural values or populist currents, and this should be taken into account by those who pursue the economic policy. These issues highlight - yet again - the fact that cultural values need to be taken into account before designing and

[3] It should be noted that this conclusion does not mean that the growth rate becomes negative. It is more likely that, as Inglehart and Baker (2000) note, the rate of growth becomes slower.

Table 7
The effects of cultural background on GDP growth rate (Arellano - Bond - two stages GMM).

	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Cultural background	−0,65**	−0,74*	−0,53*	−0,94*	−0,91*	−1,37**	−2,16***
	(−2,17)	(−1,66)	(−1,96)	(−1,89)	(−1,96)	(−2,23)	(−3,48)
GDP growth rate (−1)	0,54**	1,29***	0,28*	0,14	0,93***	0,46**	0,52*
	(2,46)	(9,02)	(1,49)	(0,94)	(3,60)	(1,99)	(1,73)
GDP per capita		0,30				−0,18	−0,09
		(1,00)				(−0,76)	(−0,33)
Population density			−0,01	0,01		0,01	0,01***
			(−0,81)	(0,10)		(1,13)	(3,26)
Education expenditure		0,61*			0,01*	1,08**	1,44***
		(1,74)			(1,93)	(2,38)	(3,31)
Institutional quality					−0,01	1,34	
					(−0,22)	(0,98)	
Inflation			0,04***	0,09***		0,02	−0,07
			(3,30)	(3,28)		(1,17)	(−0,81)
Trust in institutions			−0,08***	−0,02		−0,06*	0,03
			(−4,25)	(−1,34)		(−1,75)	(0,51)
Debt				−0,02***			0,01
				(−2,98)			(0,64)
Trade openness					−0,01**		−0,03**
					(−2,52)		(−2,47)
Unemployment					0,04		
					(1,18)		
Political stability				1,82*	2,29**		3,48***
				(1,96)	(2,43)		(3,57)
Patents						−1,08	−0,77**
						(−0,41)	(−2,26)
Arellano–Bond AR(1) test	0,28	0,53	0,81	0,32	0,12	0,37	0,37
Arellano–Bond AR(2) test	0,44	0,46	0,79	0,61	0,28	0,25	0,29
F-statistic	10,82***	23,33***	45,36***	20,11***	15,40***	48,59***	13,38***
Hansen test	0,45	0,10	0,35	0,51	0,23	0,33	0,58
No, of instruments	11	17	14	16	20	14	22
No, of groups	27	25	26	26	25	24	24
No, of observations	67	55	62	57	56	48	47

Notes: The brackets show the t-statistics (robust standard errors). *, ** and *** denote statistical significance at 10%, 5% and 1% significance level, respectively. Each column represents a separate regression. The cultural background is included in the equation as endogenous to GDP growth rate. All other control variables (different combinations in each column) are imported as Instrumental Variables. The rule is to keep the number of instruments smaller than the number of groups so that there is no doubt about the reliability of the Hansen test (Roodman, 2008).

Table 8
Cultural background and its effect on GDP growth rate for the two sub-periods of analysis (Arellano - Bond - two stages GMM).

		Dependent Variable: GDP growth rate 1981–1998 (17)	Dependent Variable: GDP growth rate 1999–2019 (18)
1981 - 1998	Traditional Cultural Background	0.23***	
		(5.59)	
	GDP growth rate (−1)	1.37***	
		(14.11)	
1999 - 2019	Post-Materialistic Cultural		−0.45*
	Background		(−1.60)
	GDP growth rate (−1)		0.37***
			(2.81)
Arellano–Bond AR(1) test		–	0.20
Arellano–Bond AR(2) test		–	–
F-statistic		29.15***	20.12***
Hansen test		0.51	0.66
No, of instruments		5	13
No, of groups		20	23
No, of observations		24	37

Notes: The brackets show the t-statistics (robust standard errors). *, ** and *** denote statistical significance at 10%, 5% and 1% significance level, respectively. Each column represents a separate regression. The cultural background is included in the equation as endogenous to GDP growth rate. All other control variables (different combinations in each column) are imported as Instrumental Variables. The rule is to keep the number of instruments smaller than the number of groups so that there is no doubt about the reliability of the Hansen test (Roodman, 2008).

implementing economic policy.

The analysis of this paper has some shortcomings as well. While using all data available to date to reflect the cultural background of the societies, there are many gaps in the dataset since many economies are involved only in some of the WVS and the EVS waves. The PCA that is used to express the overall measure for the cultural background does not generate values for its principal components when at least one of the observations is missing. This leads to a limitation of 67 observations in total regarding the independent variable of cultural background.

Future research could examine a relative analysis using developing countries or non-OECD countries in order to examine whether the cultural backlash hypothesis is still present and compare those results to those based on OECD countries. Moreover, future research could empirically analyze the extent to which the rise of populist parties in developed economies is due to the change in societal values from traditional/materialist to post-materialist values or due to factors such as the increased uncertainty about the future associated with the emergence of the 2008 financial crisis. More intensive future efforts to resolve endogeneity issues would promote the study of the relationship between culture and economic outcomes. Also, the next waves of the WVS and the EVS (and other related research) will help scholars reinforce their research on the change of cultural background and its effects on economic outcomes (Guisoet al. 2010). This is crucial, especially after the global financial crisis of 2008 that could be regarded as an exogenous shock to the economies, changing the behaviours of the societies.

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Supplementary materials

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