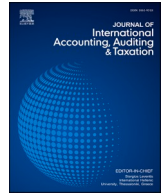




Contents lists available at ScienceDirect

Journal of International Accounting, Auditing and Taxation



National culture and tax evasion: The role of the institutional environment quality

Amir Allam^{a,*}, Tantawy Moussa^b, Mona Abdelhady^a, Ahmed Yamen^c

^a University of Westminster, Westminster Business School, 35 Marylebone Road, London NW1 5LS, United Kingdom

^b University of Westminster, London, UK & Cairo University, Egypt, Westminster Business School, 35 Marylebone Road London NW1 5LS, United Kingdom

^c The American University of the Middle East, College of Business, Egila, Kuwait

ARTICLE INFO

Keywords:

Tax evasion
National culture
Institutional environment quality
Structural equation modeling
European Union

ABSTRACT

This study examines the role of institutional environment quality (IEQ) in the relationship between national culture (NC) and tax evasion (TE). Prior research examined the direct impact of culture on tax evasion but did not examine potential mechanisms that may influence this relationship. Using structural equation modeling and examining data for the European Union (EU) countries over the 2004–2018 period, we find that countries that exhibit high levels of power distance, uncertainty avoidance, collectivism, and restraint are associated with higher levels of tax evasion. The results indicate that IEQ has a mediating effect on the NC–TE nexus, suggesting that policymakers should aim at improving the quality of national institutions to diminish the undesirable influence of culture on tax evasion levels. More specifically, we find that the rule of law, regulatory quality, and government effectiveness are the IEQ indicators that fully mediate the NC–TE relationship. Moreover, splitting the sample into older and newer EU countries shows a partial mediation effect in older EU countries and a full mediation effect in newer EU countries. Enhancing IEQ can play a more prominent role in newer EU countries to reduce the detrimental impact of cultural values on tax evasion.

1. Introduction

Globalization and the size of multinational businesses are probably the main factors that ignited scholars' interest in examining the link between national culture and tax evasion. Tax evasion is a violation of the taxation laws of a given country, resulting in the individual reporting less taxable income and eventually paying less tax (Hutchinson, 2019).¹ Culture is commonly seen as “the collective programming of the mind which distinguishes the members of one human group from another” (Hofstede, 1980, p. 25).² In a multinational business environment, it is common for accounting and tax work to be outsourced from other countries with lower tax compliance, potentially affecting the quality of the tax returns (Tsakumis et al., 2007). Empirical results of a prominent association between culture and tax evasion levels suggested that

“policymakers should consider the possible role that national culture plays in minimizing the effectiveness of tax evasion penalties” (Tsakumis et al., 2007, p. 133).

Several studies examined the ‘direct’ impact of culture on tax evasion (Alm & Torgler, 2006; Bame-Aldred et al., 2013; Ermasova et al., 2021; Hien, 2021; Hutchinson, 2019; Kountouris & Remoundou, 2013; Richardson, 2008; Torgler, 2003; Tsakumis et al., 2007). For example, using Hofstede's (1980) cultural dimensions framework, Tsakumis et al. (2007) report high levels of tax evasion in countries with higher levels of uncertainty avoidance and power distance and lower levels of individualism and masculinity. Richardson (2008) concurs with Tsakumis et al.'s (2007) results concerning uncertainty avoidance and individualism, but not power distance or masculinity. These studies examined the direct impact of national culture on tax evasion, but none considered

* Corresponding author.

E-mail addresses: a.allam@westminster.ac.uk (A. Allam), t.moussa@westminster.ac.uk (T. Moussa), m.abdelhady@westminster.ac.uk (M. Abdelhady), ahmed.yamen@aum.edu.kw (A. Yamen).

¹ The concept of tax evasion should not be confused with close but different terms such as tax avoidance and tax morale. Whereas tax evasion is a violation of the law, tax avoidance reflects the legal methods used to reduce tax liabilities and tax morale reflects the willingness to pay taxes.

² Culture is commonly proxied using Hofstede's cultural dimensions framework which is made of six dimensions: uncertainty avoidance, individualism/collectivism, masculinity/femininity, power distance, long/short term orientation, and indulgence/restraint. It is considered the most adopted model in academic research (Taras et al., 2009).

<https://doi.org/10.1016/j.intaccudtax.2023.100559>

Available online 28 June 2023

1061-9518/© 2023 The Author(s). Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

the mechanisms through which this impact is channeled. As Hofstede (2003) advocates that cultural values are unlikely to change over short periods, it is essential to explore the factors that can be effectively utilized to mediate the impact of national culture on tax evasion.³

Therefore, this study aims at filling this gap by examining institutional environment quality (IEQ) as a mechanism through which national culture influences tax evasion practices. IEQ can be defined as “the traditions and institutions by which authority in a country is exercised” (Kaufmann et al., 2011, p. 222) and is commonly measured using the World Bank’s Worldwide Governance Indicators (WGIs) (Daniel et al., 2012; Yamen et al., 2018).

On a country-level, IEQ has been found to have a direct impact on the level of tax evasion (Yamen et al., 2018) and tax morale (Frey & Torgler, 2007). But is it a mechanism through which national culture influences tax evasion? According to North (2005, p. 1), “[i]nstitutions are the rules of the game in society; more formally, they are the humanly devised constraints that shape human interaction. In consequence, they structure incentives in exchange, whether political, social or economic.” Therefore, our study proposes and empirically tests the role of IEQ as a mediating factor in the relationship between national culture and tax evasion. We argue that culture-induced variations in tax evasion levels can be mediated through IEQ.

Utilizing Hofstede’s (2003) cultural dimensions framework, we examine the direct and indirect relationships among national culture, IEQ, and tax evasion in the European Union (EU) member states for the 2004–2018 period. Moreover, this study comparatively explores the role of IEQ in addressing tax evasion practices in older (pre-2004) and newer (post-2004) EU member states. Many of the countries that joined the EU since 2004 are former communist countries. Gërxfhani (2004) asserts that the formal institutions in these countries have been demolished as a result of the political changes they went through after the collapse of the Soviet Union. However, informal institutions (such as norms and rules of behavior) developed during the communist era continue to shape behavior and attitudes (Nelson et al., 1997; Pejovich, 1999). Taking a historical perspective and based on a laboratory experiment, Kamm et al. (2021) find past institutions to influence the perception of individuals with regard to others’ tax compliance levels. Thus, it can be expected that societies with a history of tax evasion that now have high quality institutions may still suffer high levels of tax evasion. The composition of the EU (including countries with historically low levels of tax compliance) and the current threats to its unity, in addition to its position as an economic power, are the main factors for our focus on this area of the world.

Our results reveal a significant cultural distinction between older and newer EU member states. The results also indicate that national cultural influences IEQ, which in turn influences tax evasion practices. This suggests that the impact of national culture on tax evasion levels can be minimized by enhancing the quality of the institutional environment. The results are consistent with those reported in previous research on the impact of national culture on the institutional environment (e.g., Amable, 2003; Aoki, 2001; Daniel et al., 2012) and the impact of national culture on tax evasion (e.g., Bame-Aldred et al., 2013; Richardson, 2008; Tsakumis et al., 2007). Moreover, splitting the sample into older and newer EU countries shows a partial mediation effect in older EU countries and a full mediation effect in newer EU countries. These results imply that governance reforms alone might not yield the desired effects for all countries.

The study contributes to the existing literature by examining the relationships among national culture, tax evasion, and IEQ. First, to the best of our knowledge, this is the first study to examine the role of IEQ as a mediating mechanism through which to deal with the impact of national culture rather than to passively witness its effects on tax evasion.

The results of this study may provide regulators and policymakers with a better understanding of how the quality of various institutional governance systems can minimize the detrimental effects of certain cultural characteristics on tax evasion. Second, as most of the literature on tax evasion is focused on single-country cases (Atwood et al., 2012; Bame-Aldred et al., 2013; Jiménez-Angueira, 2018; Lanis & Richardson, 2018; Lin et al., 2017; Zeng, 2019), this study extends and complements previous research by providing empirical evidence on tax evasion in the EU in a comparative context. The focus on the EU makes a timely contribution to the debate around its political, social, and economic unity, and thereby allows us to distinctively shed crucial and timely empirical insights on the impact of IEQ difference on tax evasion levels (Yamen et al., 2018).

The remainder of this paper is organized as follows. The next section sets out the research background and attempts to explain our decision to focus on the EU. It also provides a review of previous research and presents the hypotheses development. Section three covers the research design of the study, followed by a discussion of the results in Section four. The paper concludes with a summary of the main findings, limitations, and future research.

2. Research background, literature review and hypotheses development

2.1. Why the EU?

We chose the EU as our focus because its size has nearly doubled since the enlargement wave of 2004 (followed by two more in 2007 and 2013). The accession of the newer member states has contributed to the cultural diversity of the EU as many of the countries that joined the EU since 2004 are former communist countries. In these countries, Gërxfhani (2004) asserts, formal institutions (laws and regulations) were demolished as a result of political changes. However, norms and rules of behavior (informal institutions) developed during the communist era continued to shape behavior and attitudes (Nelson et al., 1997; Pejovich, 1999). The clash between these two forms of institutions leads to a situation where “non-compliant behaviors proliferate, forming various underground economies” (Feige, 1997, p. 22). In other words, tax evasion is expected to be higher in newer EU member states.

However, to join the EU, a new member state is expected to “preserve democratic governance and human rights, has a functioning market economy, and accepts the obligations and intent of the EU”; the new member state should establish the various institutions needed to help the country meet these conditions.⁴ Evidence from previous research on tax evasion suggests that meeting the conditions does not automatically lead to erasing the differences between the two groups. For example, Yamen et al. (2018) report evidence of a significant difference in tax evasion levels between the older (pre-2004) and newer (post-2004) member states. Their findings are consistent with Frey and Torgler’s (2007) evidence of lower tax morale in Central Eastern European and former Soviet Union countries.

Economic pressures on EU member states escalated after the 2008 financial crisis. The consequences have been more severe in some countries, such as Greece, Italy, and Spain (Yamen et al., 2018). This contributed to widening the gap in standards of living among member states and increased motivation to immigrate from weaker to stronger economies. Using immigrant data from the European Social Survey to examine the role of culture in shaping tax morale, Kountouris and Remoundou (2013, p. 104) report that “the level of tax morale in the country of immigrant origin influences individual tax morale in the

³ Nevertheless, such factors should not be expected to result in significant results over the short run.

⁴ The criteria are known as the Copenhagen Criteria (Source: European Commission website <https://www.ec.europa.eu>). The accession criteria include political (e.g., stability of institutions), economic (e.g., having a functioning market economy), and administrative conditions.

Table 1
Summary of variable definitions and data sources.

Variable	Definition	Data source
Tax evasion (TE)	The size of the shadow economy using the MIMIC model (as a percentage of the country's gross domestic product (GDP)).	Medina and Schneider (2018)
National culture (NC)	Power distance (PDI)	Hofstede, et al. (2010)
	Individualism (IDV)	
	Masculinity (MAS)	
	Uncertainty avoidance (UAI)	
	Long term orientation (LTO)	
	Indulgence (IND)	
Institutional environment quality (IEQ)	Voice and Accountability (VA)	World Bank (2019)
	Political Stability (PS)	
	Government Effectiveness (GE)	
	Regulatory Quality (RQ)	
	Rule of Law (RL)	
	Control of Corruption (CC)	
Legal system (LEGAL)	A dummy variable equal to 1 for common law countries and 0 for code law countries.	Richardson (2006), La Porta et al. (1998)
Agriculture (AGR)	The value-added of agriculture as a percentage of GDP.	World Bank
Service sector (SERV)	The value-added of the service sector as a percentage of GDP.	World Bank
Age (AGE)	% of the population aged 65 and above as a percentage of the total population.	World Bank
Gender (FEMALE)	% of the population is female.	World Bank
Urbanization (URBAN)	% of the population living in urban areas.	United Nations
Imports of goods and services (IMPORT)	The value of all goods and other market services received from the rest of the world.	World Bank
Unemployment (UNEM)	Unemployment as a percentage of the total labor force.	World Bank
Employment in the agricultural sector (EAGR)	% of employment in the agricultural sector.	World Bank
EU membership (EUM)	A dummy variable equal to 1 for newer EU member states that joined the EU in 2004 or later and 0 for older EU member states that established or joined the EU before 2004	

destination country.” It is argued that immigration was a significant factor in the UK political debates before the 2016 referendum on EU membership and the resulting vote to leave the union (Yamen et al., 2018).

Accordingly, the composition of the EU and the current threats to its unity in addition to its position as an economic power are the main factors for our focus on the EU countries. Having a better understanding of the mechanisms that can be used to mediate the impact of culture on tax evasion can enable EU policymakers to promote tax compliance in new member states. This can potentially contribute to achieving a more homogenous welfare provision across the union as “[t]here is a direct link between tax compliance on the one hand and budgeted deficits and investments in public goods on the other” and that “effective tax collection is a precondition for the collective good provision and economic growth, which may be especially important in transition countries” (Gërxhani, 2004, p. 730).

2.2. Literature review and hypotheses development

As mentioned earlier, the World Bank's six WGI are commonly used as a proxy of IEQ. These indicators are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption (see Table 1 for full explanations). The discussion provided in this section, leading to the study's hypotheses, is based on theoretical arguments and empirical evidence linking these six WGIs to national culture and tax evasion.

2.2.1. The impact of national culture on the institutional environment quality

The impact of national culture on institutions has been examined in a few studies (Alesina & Giuliano, 2015; Cassar et al., 2014; Gray, 1988; Guillén, 2001; Licht et al., 2007). The institutional environment of a country can be seen as a collection of social beliefs and practices that are linked to different functional areas within a society (Scott, 2013).

Theoretically, as a “collective programming of the mind”, culture shapes a group's perceptions and “way of thinking” (Hofstede, 1980, p.

25); thus, it shapes a country's institutional environment. Furthermore, Aoki (2001) highlights the importance of cultural beliefs in shaping institutions and questions whether the evolution of institutions is linked to 'cultural genes'. These arguments are consistent with Scott's (1995, p. 33) view that "[i]nstitutions are transported by various carriers – cultures, structures, and routines." North (1990) advocates that national culture shapes institutions in the long-term. Strange et al. (2009) highlight the role of societies in creating and maintaining effective institutions.

Empirically, a few studies report a significant association between national culture and IEQ. Studying the interaction between national culture and institutions, Cassar et al. (2014) assert that, when lacking strong formal institutions, the cultural origin is significantly associated with opportunistic behaviors and corruption. In addition, they report a significant negative association between collectivism, one of the main cultural dimensions, and corruption. Moreover, utilizing Hofstede's cultural dimensions and based on a sample of 50 countries, Licht et al. (2007) report evidence of a significant association between national culture and the level of rule of law, control of corruption, and voice and accountability in a society. Furthermore, Daniel et al. (2012) examine the impact of national economic culture and institutional environment on corporate governance practice in 42 countries from six continents.⁵ They report a positive and significant association between a country's national culture and its IEQ. Accordingly, based on the above discussion, we hypothesize that:

H1. A country's national culture has a direct impact on its institutional environment quality.

2.2.2. The impact of the institutional environment quality on tax evasion

The association between the various IEQ indicators and tax evasion has been examined in prior research. For example, some studies examined the role government corruption plays in decreasing tax morale and, thus, higher tax evasion (Ballas & Tsoukas, 1998; Smatrakalev, 1998; Vaguine, 1998). The argument is that corruption leads to a legitimization of tax evasion perception by taxpayers (Litina & Palivos, 2016). Corruption has also been linked to corporate tax avoidance (Al-Hadi et al., 2021).

Related to voice and accountability, other studies report evidence of a link between tax compliance and voting in elections (e.g., Alm et al., 1999; Feld & Tyran, 2002; Wahl et al., 2010). In addition, Alm and Torgler (2006) report a positive association between the existence of established democratic systems (political stability) and tax morale. Moreover, Torgler and Schneider (2009) assert that better institutions and greater government effectiveness motivate individuals to act legally, including tax compliance. Richardson (2008) reports a significant association between high tax evasion levels and lower levels of legal enforcement and trust in government.

There is also evidence of a positive link between tax compliance and the simplicity of tax systems (Awasthi & Bayraktar, 2015; Richardson, 2006) and auditing regulation strength (Benkraiem et al., 2021), both reflecting a high regulatory quality. Furthermore, based on an examination of tax morale in 30 European countries, Frey and Torgler (2007) report a positive association between institutional quality and tax morale. Recently, Yamen et al. (2018) investigated the impact of the IEQ on tax evasion and concluded that all the World Bank's WGs, except rule of law, are significant determinants of tax evasion levels. Accordingly, our second hypothesis is:

H2. Institutional environment quality has a direct impact on tax evasion.

⁵ Daniel et al. (2012) tested the same hypothesis but used a different global sample of countries, whereas our sample is made of only EU countries. In addition, we examine a more recent period. Similar comments can also be made for our second and third hypotheses.

2.2.3. The direct and indirect impact of national culture on tax evasion through its influence on the institutional environment

The direct impact of culture on tax evasion and morale has been examined in many studies, albeit with conflicting results (Alm & Torgler, 2006; Bame-Aldred et al., 2013; Ermasova et al., 2021; Hutchinson, 2019; Kountouris & Remoundou, 2013; Putnam et al., 2016; Richardson, 2008; Torgler, 2003; Tsakumis et al., 2007). Most studies report a significant association between culture and tax evasion. Tsakumis et al. (2007) is probably the first study to use Hofstede's (1980) framework in explaining international tax evasion differences. Covering 50 countries, they report high levels of tax evasion in countries with higher levels of uncertainty avoidance, collectivism, feminism, and power distance. Building on Tsakumis et al.'s (2007) model, Richardson (2008) uses various measures of tax evasion and adds several political, legal, and religious variables. His results are consistent with Tsakumis et al. (2007) regarding uncertainty avoidance and collectivism but not power distance and feminism.

Other cultural dimensions have also featured inconsistent results in the literature. For example, theoretical analysis suggests that decision makers in individualistic cultures tend to value firm targets over ethical means needed to achieve their targets (Messner & Rosenfeld, 2012); accordingly, it is more likely that firms will attempt to evade tax in such societies (Bame-Aldred et al., 2013). Nevertheless, empirical studies reach different conclusions as individualism is found to be negatively associated with tax evasion in both Tsakumis et al. (2007) and Richardson (2008) studies, but positively associated in Bame-Aldred et al. (2013).

The above discussion indicates that prior research has mainly focused on the 'direct' impact of national culture on tax evasion but did not consider the mechanisms through which this impact takes place. The literature on the indirect influence of national culture on tax evasion is very limited. One example is Brink and Porcano (2016), which examine the role of tax morale on the association between national culture and tax evasion. They report a significantly positive (negative) association between individualism and power distance (masculinity) and tax morale. They also report a negative significant association between tax morale and tax evasion. Lower levels of tax morale are noticed in countries with higher tax evasion levels. However, only uncertainty avoidance (positive) and masculinity (negative) were found to be significantly associated with tax avoidance in their full model (different results are reported for developed and developing countries).

In this study, we examine the indirect influence of IEQ as the above discussion illustrates that national culture influences IEQ which, in turn, impacts tax evasion. Accordingly, our third and fourth hypotheses are formulated as follow:

H3. A country's national culture has a direct impact on tax evasion.

H4. Institutional environment quality mediates the relationship between national culture and tax evasion.

Fig. 1 demonstrates our theoretical model including the main constructs and the hypothesized relationships.

3. Research design

3.1. Sample selection and data sources

This study is based on EU countries for a period of 15 years (2004–2018). The sample begins in 2004 when the EU witnessed its biggest expansion wave. Cyprus and Croatia were excluded from the study due to the unavailability of data. This results in a final sample of 390 country-year observations from 26 European countries. Our sample includes 15 older EU countries (225 country-year observations) and 11 newer EU countries for the countries that joined the EU after 2004 (165 country-year observations).

We obtain the data from three different sources: tax evasion data from the database developed by Medina and Schneider (2018), national culture from Hofstede (2019), and IEQ and related national

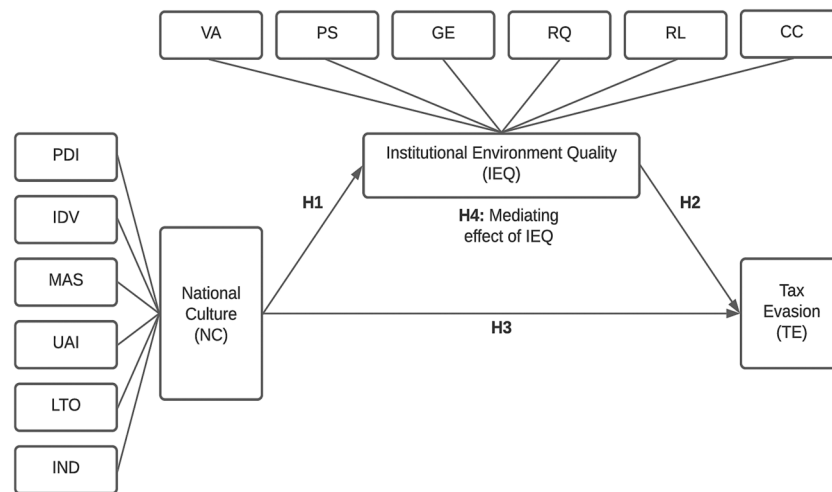


Fig. 1. Theoretical model.

macroeconomic data from the World Bank's database (World Bank, 2019).

3.2. Measurement of variables

3.2.1. Tax evasion

We use the size of the shadow economy as a proxy for tax evasion which can be estimated at the micro or the macro levels (Schneider & Buehn, 2012). Measured at the micro level, it is based on surveys, questionnaires, or other indirect means such as the demand for currency. At the macro level, the measurement is based on a few factors, including the level of employment, the tax burden, and the degree of regulation (Gemmell & Hasseldine, 2012; Medina & Schneider, 2018). We use the MIMIC model (Multiple Indicators Multiple Causes) which is a macroeconomic measure of the shadow economy. The MIMIC model considers different indicators that directly affect the development of shadow economies' sizes over time and can measure tax evasion more precisely (Alm, 2012; Medina & Schneider, 2018; Schneider & Buehn, 2012; Yamen et al., 2018).

In MIMIC models, the shadow economy is considered an unobserved variable, which can be analyzed and measured using some observed variables using a covariance matrix. This process uses a measurement model that links observed indicators with the unobserved variable. Then, it is followed by structural equation modeling to link the causal variables with the unobserved variable. The MIMIC model is considered a confirmatory technique as the model is constructed in advance based on economic theories and literature. The main goal of such a confirmatory analysis is to estimate the parameters by setting the observed causes and indicators of the shadow economy and testing the model fitness (Elgin & Schneider, 2016).

The standard MIMIC approach has been used in literature for a long time (Chaudhuri et al., 2006; Dell'Anno, 2007; Dell'Anno & Solomon, 2008), but there was criticism regarding using the gross domestic product (GDP) as a cause and indicator variable (Medina & Schneider, 2018). This critique has been addressed by taking advantage of the novel method suggested by Henderson, Storeygard, and Weil (2012) that uses the light intensity data collected by satellites as a proxy for real economic activity rather than using the GDP.

3.2.2. Institutional environment quality

We follow several related studies (e.g., Daniel et al., 2012; Elamer et al., 2020; Moussa et al., 2022; Yamen et al., 2018) in using the Worldwide Governance Indicators developed by the World Bank to measure IEQ. These indicators are frequently used by governments in countries, such as the US, when allocating grants to foreign countries

because they are a reliable measure of IEQ (Thomas, 2010). The IEQ score is calculated as a composite measure for the overall six indicators, which are: voice and accountability (VA), political stability (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), and control of corruption (CC). The IEQ score ranges from (−2.5) to (+2.5), with a higher IEQ indicating a greater level of the institutional environment at the country-level (World Bank, 2019). A description of these six indicators is given in Table 1.

3.2.3. National culture

We follow several related studies (Ermasova et al., 2021; Khlif & Khlif, 2016; Richardson, 2008; Tsakumis et al., 2007) in using Hofstede's cultural dimensions model to measure national culture (NC). In his original study of 50 countries and 3 regions, Hofstede (1980) studied the influence of societal national culture on different 'organizational value systems'. He found that these value systems vary from one country to another due to their different national cultures. Mainly using factor analysis, his study of different subsidiaries of the large multinational organization IBM in 72 countries led to the identification and development of a few societal values, named 'cultural dimensions' that distinguish the national cultures of these countries and which reflect fundamental society problems.

Hofstede conducted his survey twice, in 1968 and again in 1972, yielding results from more than 116,000 questionnaires on work values. Later, additional data were collected from another cross-national study by Bond and Hwang (1986), leading to the fifth dimension, long-term/short-term orientation. More recently, a sixth dimension, indulgence/restraint, was added to the framework (Hofstede et al., 2010). The validity and reliability of the framework are documented in many studies (Doupnik & Tsakumis, 2004; Merritt, 2000; Newman & Nollen, 1996; Richardson, 2008; Schuler & Rogovsky, 1998; Tsakumis et al., 2007).

Accordingly, using Hofstede's framework, NC is measured in six dimensions: power distance (PDI), individualism (IDV), masculinity (MAS), uncertainty avoidance (UAI), long term orientation (LTO) and indulgence (IND), scoring from 0 to 100 (Hofstede, 2003, 2011). See Table 1 for a detailed description of the six cultural dimensions.

3.2.4. Control variables

We included a broad set of country-level factors that might affect tax evasion to control for the legal, social, and economic differences between countries. Like other related studies (Richardson, 2006; Witte & Woodbury, 1985; Yamen et al., 2018), we control for the level of education and knowledge as prior studies suggest that taxpayers' positive perception of taxation increases with the level of education and knowledge, leading to lower tax evasion (Yamen et al., 2018).

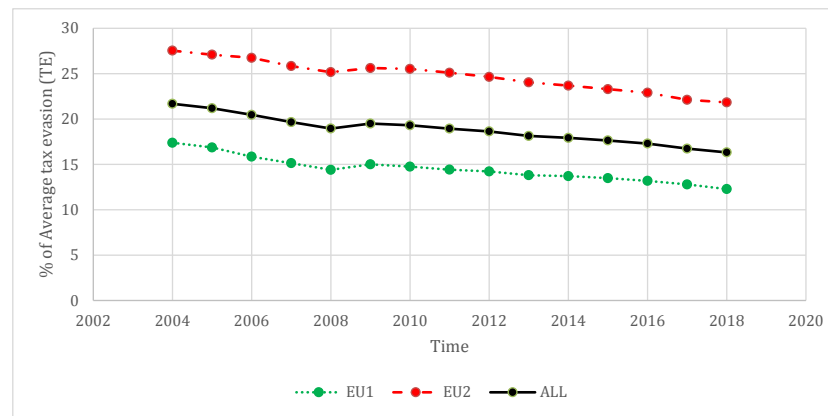


Fig. 2. Tax evasion behavior in the EU countries (2004 – 2018).

Accordingly, to control for differences in the level of education and knowledge among EU member states, we use the Human Development Index (HDI) data developed by the United Nations Development Programme (United Nations, 2022). In addition, as the literature suggests that countries belonging to a common legal system are more compliant with tax rules (Richardson, 2006), we control for the country's legal system (1 for common law countries and 0 otherwise).

We also use several socio-demographic characteristics as control variables by following related empirical studies (Hanno & Violette, 1996; Jackson & Milliron, 1986; Richardson, 2006; Yamen et al., 2018). These include age (AGE), gender (FEMALE), unemployment (UNEM), agriculture (AGR) as a percentage of the GDP, services income source (SERV), urbanization (URBAN), imports of goods and services (IMPORT), EU membership (EUM), and year dummies (TIME). For example, the findings of prior studies suggest that female and older taxpayers are largely more compliant than male and younger taxpayers, which leads to a decline in the level of tax evasion (see, for example, Hanno & Violette, 1996; Jackson & Milliron, 1986). Additionally, the higher the unemployment rate, the higher the expected level of tax evasion (Torgler & Schneider, 2009). Yamen et al. (2018) also find similar evidence among EU countries. As a source of income, agriculture has been found to be a factor linked to higher levels of tax evasion compared to other sources of income (Wallschutzky, 1984). For brevity, we do not develop direct theoretical links between each of these control variables and tax evasion, but many studies suggest they can influence tax evasion (e.g., Richardson, 2006; Yamen et al., 2018). Table 1 shows the definition of all variables and data sources and their codes.

3.3. Structural equation modeling

To test the theoretical research model, we use structural equation modeling (SEM) with maximum likelihood estimation. SEM has some advantages that makes it a powerful statistical technique, for our study, compared to multiple regression analysis. SEM combines multiple regression, path analysis (or causal modeling), and confirmatory factor analysis to evaluate multiple hypothesized causal relationships allowing explicitly models measurement errors resulting in less biased estimations for parameters (Hair et al., 2014, 2017). Moreover, it allows all the variables to correlate (inter-correlations), and hence, the cause-effect relationships among variables can be inferred (Bagozzi & Yi, 2012; Moussa et al., 2020). As a confirmatory technique, it helps in validating theoretical models that are based on hypothesized relationships (Daniel et al., 2012). Finally, SEM simultaneously considers both direct and indirect structural effects between latent variables (Hair et al., 2014).

4. Data analysis and results

4.1. Descriptive statistics

Fig. 2 provides an initial picture of the extent of tax evasion for all EU, EU1 (pre-2004) and EU2 (post-2004) countries from 2004 to 2018. The figure reveals a few interesting results. First, there has been a steady decrease in the level of tax evasion over time in all EU countries. The mean value of TE declined steadily from 21.70 in 2004 to 16.30 in 2018. Second, similar decreasing patterns can be observed with respect to EU1 and EU2 countries. The level of tax evasion in EU1 (EU2) ranges from 6.72 (12.83) to 28.1 (35.3) with an average of 14.49 (24.74) and decreasing steadily from 17.40 (27.50) in 2004 to 12.30 (21.80) in 2018. Finally, the results also indicate that on average EU2 countries show considerably higher levels of TE than EU1 (by 71%). The higher TE levels in the newer EU member states (EU2) can be linked to the fact that most of these countries are in Eastern and Central Europe, including some former Soviet Union countries, that have, historically, exhibited high corruption and low tax compliance levels (Alon & Hageman, 2013). These findings are consistent with prior research (e.g., Alm & Torgler, 2006; Yamen et al., 2018) as the EU1 countries have been subject to many directives and regulations, covering economic, social, and political aspects, leading to higher levels of tax compliance compared to the EU2 countries.

Table 2 reports the mean values of TE, NC, and IEQ across EU countries. It is evident that Malta (28.8), Romania (26.5), and Greece (26) have the highest levels of TE, followed by Italy (24.5), Bulgaria (24.1), and Spain (23.4). The lowest scores are observed for Austria (8.6), Netherlands (9.4), Germany (10.2), and United Kingdom (10.2). Moreover, all EU2 countries' TE averages are above the entire EU overall average of 18.83 except for the Czech Republic (12.40) and Slovakia (12.60). These results indicates that tax evasion is a more fundamental problem in EU2.

Table 2 shows that all EU1 countries have higher averages for all IEQ indicators (1.34) compared to EU2 countries (0.74). The results also reveal that Eastern and Central European (in EU2) such as Romania, Bulgaria, Slovenia, Greece, Poland, and Slovakia, show a higher level on four cultural dimensions, power distance, collectivism, uncertainty avoidance, and restraint, and a relatively low IEQ compared to other EU countries. Romania, an EU2, exhibits the highest NC and lowest IEQ values among the sampled countries. By contrast, the Scandinavian countries of Denmark, Finland, and Sweden exhibit relatively higher IEQ scores and lower TE and NC than other European countries. This evidence supports prior studies (e.g., Alon & Hageman, 2013; Yamen et al., 2018) that report a negative effect of IEQ on tax evasion.

Table 3 presents summary statistics and bivariate correlations among the study variables. The correlations are consistent with the hypothesized relationships. It is evident that NC variables are significantly

Table 2
Mean values of Tax Evasion, National Culture, and Institutional environment quality across countries.

Variable/Country	Tax Evasion (TE)	National Culture (NC)							Institutional environment quality (IEQ)						
		PDI	IDV	MAS	UAI	LTO	IND	NC	VA	PS	GE	RQ	RL	CC	IEQ
Panel A (EU1)															
Austria	8.60	11	45	79	70	60	37	40.75	1.39	1.16	1.65	1.51	1.86	1.67	1.54
Belgium	18.90	65	25	54	94	82	43	56.75	1.37	0.72	1.52	1.29	1.38	1.50	1.30
Denmark	14.50	18	26	16	23	35	30	24.25	1.59	1.00	2.06	1.77	1.94	2.34	1.78
Finland	12.20	33	37	26	59	38	43	43.00	1.55	1.34	2.08	1.77	1.98	2.28	1.83
France	12.70	68	29	43	86	63	52	58.75	1.25	0.40	1.49	1.19	1.45	1.39	1.19
Germany	10.20	35	33	66	65	83	60	48.25	1.39	0.81	1.61	1.61	1.69	1.82	1.49
Greece	26.00	60	65	57	100	45	50	68.75	0.85	0.07	0.49	0.60	0.53	0.05	0.43
Ireland	12.00	28	30	68	35	24	35	32.00	1.37	1.05	1.48	1.68	1.67	1.60	1.48
Italy	24.50	50	24	70	75	61	70	54.75	1.02	0.43	0.43	0.84	0.41	0.20	0.55
Luxembourg	10.40	40	40	50	70	64	44	48.50	1.57	1.39	1.70	1.71	1.81	2.01	1.70
Netherlands	9.40	38	20	14	53	67	32	35.75	1.56	0.97	1.82	1.81	1.83	2.04	1.67
Portugal	20.90	63	73	31	99	28	67	75.50	1.19	0.90	1.09	0.94	1.10	1.01	1.04
Spain	23.40	57	49	42	86	48	56	62.00	1.10	0.00	1.09	1.07	1.08	0.95	0.88
Sweden	11.60	31	29	5	29	53	22	27.75	1.59	1.13	1.92	1.73	1.94	2.20	1.75
United Kingdom	10.20	35	11	66	35	51	31	28.00	1.35	0.36	1.60	1.74	1.72	1.76	1.42
Average EU1	14.49	42.13	35.73	45.80	65.27	53.47	44.80	46.98	1.34	0.78	1.47	1.42	1.49	1.52	1.34
Panel B (EU2)															
Bulgaria	24.10	70	70	40	85	69	84	77.25	0.48	0.25	0.13	0.61	-0.08	-0.16	0.21
Czech Republic	12.40	57	42	57	74	70	71	61.00	0.99	0.99	0.96	1.13	0.99	0.39	0.91
Estonia	20.00	40	40	30	60	82	84	56.00	1.12	0.65	1.05	1.46	1.18	1.13	1.10
Hungary	21.80	46	20	88	82	58	69	54.25	0.78	0.76	0.65	0.95	0.71	0.37	0.70
Latvia	18.50	44	30	9	63	69	87	56.00	0.80	0.50	0.78	1.04	0.79	0.34	0.71
Lithuania	21.20	42	40	19	65	82	84	57.75	0.92	0.77	0.84	1.09	0.82	0.39	0.81
Malta	28.80	56	41	47	96	47	34	56.75	1.20	1.20	1.07	1.23	1.33	0.85	1.15
Poland	21.20	68	40	64	93	38	71	68.00	0.95	0.72	0.60	0.91	0.61	0.51	0.72
Romania	26.50	90	70	42	90	52	80	82.50	0.44	0.16	-0.23	0.51	0.08	-0.16	0.13
Slovakia	12.60	100	48	100	51	77	72	67.75	0.94	0.92	0.84	0.99	0.54	0.28	0.75
Slovenia	21.40	71	73	19	88	49	52	71.00	1.03	0.99	1.03	0.73	1.00	0.90	0.95
Average EU2	24.74	62.18	46.73	46.82	77.00	63.00	71.64	64.39	0.88	0.72	0.70	0.97	0.72	0.44	0.74
Average all EU	18.83	50.62	40.39	46.23	70.23	57.50	56.15	53.52	1.15	0.76	1.14	1.23	1.17	1.06	1.08

Note: All variables defined in Table 1.

associated positively with TE, except MAS. Moreover, IEQ indicators have a highly significant negative relationship with TE, suggesting that the higher the IEQ, the lower the level of tax evasion. Moreover, NC dimensions of power distance, collectivism, uncertainty avoidance, and restraint maintain a negative association with IEQ. This result implies that the cultural values of actors and their behavior in society shape the effectiveness of institutional environment rules and practices.

4.2. Validation of measures

To assess the validity and reliability of the study constructs, we perform a confirmatory factor analysis (CFA). Table 4 shows the statistics of the measurement analysis for both IEQ and NC constructs. All IEQ indicators are highly significant ($p < 0.001$), and all factor loadings exceed the recommended cut-off point of 0.60 (Kline, 2005). Moreover, as shown in Table 4, all NC dimensions are greater than 0.60, except for MAS and LTO. Thus, the NC construct is based on the other 4 cultural dimensions.

To determine the construct reliability of each construct, we used Cronbach Alpha and composite reliability (CR). Table 4 shows that all values of Cronbach alpha and CR exceed considerably the recommended threshold of 0.70, which supports the construct reliability of these constructs (Hair et al., 2019). Moreover, to verify the convergent validity of the measurement models, the average extracted variance (AVE) was examined. All constructs are above the recommended threshold of 0.50, which indicates that the latent constructs account for at least 50% of the variance in the items. This evidence largely supports convergent validity (Hair et al., 2019). The goodness-of-fit of the structural models is analyzed through Goodness-of-Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Root Mean Square Residual (RMSEA). Moreover, the overall goodness fit indices of our measurement models (GFI, AGFI, CFI, and NFI greater than 0.90 and RMSEA < 0.07) show a very good fit, and their

indicators are within the desirable and acceptable range.

To further examine the discriminant validity (i.e., measures of un-related constructs do not correlate) of our NC and IEQ constructs, we conduct a Heterotrait-monotrait (HTMT) analysis using partial least squares structural equation modeling (PLS-SEM). The HTMT has proven superior to other methods of evaluating discriminant validity (Henseler et al., 2015). Based on the measurement validation analysis, all HTMT ratios are below the maximum threshold of 0.85 as suggested by Henseler et al. (2015), thus supporting the discriminant validity of these constructs.

4.3. Structural model results and hypotheses testing

Table 5 reports the results of the structural model to examine the relations between national culture (NC) and the other main variables, IEQ and TE. As shown in Table 5, the overall fit measures are well above the recommended values, suggesting that the model fits the data well (Hair et al., 2014).

The results in Table 5 reveal a significant negative relationship between national culture and IEQ ($\beta = -1.082, p < 0.001$), thus, providing empirical support for H1. The analysis also shows a negative relationship between IEQ and tax evasion ($\beta = -0.227, p < 0.001$), implying that H2 is empirically supported. This result offers empirical support for the findings of Yamen et al. (2018), Awasthi and Bayraktar (2015), and Hofmann et al. (2014), indicating that high regulatory quality and control of corruption have a negative effect on tax evasion. They suggest that better institutions and efficient government allocation of resources will lead to greater tax compliance among taxpayers. This result also supports the evidence of Alon & Hageman (2013) that a higher level of corruption can incentivize businesses to evade paying taxes.

Also, there is strong support for H3. The results indicate that national culture is positively related to tax evasion levels ($\beta = 0.164, p < 0.001$).

Table 3
Descriptive statistics and correlations among variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mean	18.83	50.62	40.39	46.23	70.23	57.50	56.15	53.52	1.15	0.76	1.14	1.29	1.17	1.06	1.08	2.24	5.96	17.20	62.65	51.32	73.34	8.60	59.75	0.12
Standard Dev.	7.12	20.40	17.11	24.58	21.93	16.68	19.60	12.34	0.33	0.41	0.60	0.43	0.60	0.80	0.49	1.44	5.72	2.44	6.49	1.09	12.52	4.25	31.70	0.32
Minimum	6.72	11.00	11.00	5.00	23.00	24.00	22.00	24.67	0.31	-0.47	-0.36	0.15	-0.17	-0.30	-0.02	0.21	0.99	10.49	43.15	49.54	51.31	2.24	23.02	0.00
Maximum	35.30	100.00	73.00	100.00	100.00	83.00	87.00	74.67	1.80	1.62	2.35	2.05	2.10	2.47	1.96	12.71	32.57	22.75	79.33	54.21	98.00	27.47	187.17	1.00
1. TE	1																							
2. PDI	0.47**	1																						
3. IDV	0.48**	0.54**	1																					
4. MAS	-0.17**	0.21**	-0.10*	1																				
5. UAI	0.48**	0.58**	0.56**	0.16**	1																			
6. LTO	0.11*	0.13**	-0.17**	0.08	0.03	1																		
7. IND	0.69**	0.50**	0.38**	0.08	0.40**	0.41**	1																	
8. NC	0.67**	0.84**	0.77**	0.12*	0.82**	0.13**	0.72**	1																
9. VA	-0.75**	-0.63**	-0.50**	-0.17**	-0.50**	-0.15**	-0.77**	-0.76**	1															
10. PS	-0.41**	-0.38**	-0.19**	-0.07	-0.32**	-0.10	-0.40**	-0.42**	0.58**	1														
11. GE	-0.77**	-0.65**	-0.51**	-0.23**	-0.56**	-0.11*	-0.75**	-0.79**	0.92**	0.58**	1													
12. RQ	-0.71**	-0.72**	-0.63**	-0.16**	-0.69**	-0.03	-0.64**	-0.86**	0.87**	0.54**	0.88**	1												
13. RL	-0.78**	-0.71**	-0.51**	-0.22**	-0.54**	-0.16**	-0.78**	-0.81**	0.93**	0.58**	0.95**	0.90**	1											
14. CC	-0.75**	-0.67**	-0.49**	-0.26**	-0.57**	-0.17**	-0.77**	-0.79**	0.93**	0.53**	0.94**	0.90**	0.95**	1										
15. IEQ	-0.77**	-0.69**	-0.52**	-0.21**	-0.59**	-0.14**	-0.76**	-0.81**	0.95**	0.67**	0.97**	0.93**	0.98**	0.97**	1									
16. AGR	0.75**	0.44**	0.48**	-0.11*	0.34**	0.07	0.65**	0.60**	-0.76**	-0.47**	-0.73**	-0.66**	-0.74**	-0.69**	-0.73**	1								
17. EAGR	0.58**	0.45**	0.58**	-0.10	0.39**	-0.21**	0.48**	0.59**	-0.63**	-0.39**	-0.67**	-0.61**	-0.61**	-0.56**	-0.63**	0.73**	1							
18. AGE	0.08	-0.14**	0.07	-0.25**	0.20**	0.17**	0.12*	0.08	-0.10*	-0.32**	-0.06	-0.16**	-0.08	-0.07	-0.13*	0.06	-0.09	1						
19. SERV	-0.46**	-0.29**	-0.33**	-0.11*	-0.04	-0.02	-0.50**	-0.36**	0.50**	0.03	0.43**	0.37**	0.46**	0.42**	0.41**	-0.60**	-0.50**	0.20**	1					
20. FemAL	0.52**	0.09	0.02	-0.11*	0.14**	0.38**	0.77**	0.32**	-0.47**	-0.24**	-0.40**	-0.33**	-0.42**	-0.46**	-0.43**	0.44**	0.27**	0.17**	-0.28**	1				
21. Urban	-0.33**	-0.34**	-0.50**	-0.26**	-0.14**	0.10	-0.56**	-0.47**	0.53**	0.147**	0.53**	0.50**	0.51**	0.52**	0.51**	-0.43**	-0.58**	0.19**	0.64**	-0.40**	1			
22. UNEM	0.25**	0.26**	0.23**	0.06	0.22**	-0.09	0.24**	0.30**	-0.31**	-0.46**	-0.30**	-0.41**	-0.35**	-0.37**	-0.39**	0.24**	0.18**	0.077	0.077	0.21**	-0.13*	1		
23. Import	-0.03	0.02	-0.02	0.09	0.04	0.17**	-0.09	-0.01	0.09	0.48**	0.07	0.15**	0.11*	0.05	0.15**	-0.21**	-0.26**	-0.40**	0.23**	-0.13**	0.23**	-0.24**	1	
24. Legal	-0.14**	-0.19**	-0.28**	0.21**	-0.25**	-0.37**	-0.42**	-0.36**	0.17**	0.10*	0.15**	0.28**	0.24**	0.16**	0.20**	-0.31**	-0.20**	-0.31**	0.23**	-0.29**	0.17**	-0.13**	0.27**	1

Notes: * significant at the 0.05 level, ** significant at the 0.01 level, and *** significant at the 0.001 level. All variables defined in Table 1.

Table 4
Confirmatory factor analysis (CFA) checking validity and reliability of the measurement models.

Constructs and Items		Standardized loadings	Goodness of fit indicators		Acceptable standard fit
Institutional environment quality (IEQ)	VA	0.948***	GFI	0.992	>0.90
	PS	0.595***	AGFI	0.977	>0.90
	GE	0.971***	CFI	0.999	>0.90
	RQ	0.919***	NFI	0.997	>0.90
	RL	0.979***	RMSEA	0.019	<0.07
	CC	0.972***			
Cronbach Alpha:		0.946			
Composite reliability (CR):		0.910			
Average variances extracted (AVE):		0.690			
National culture (NC)	PDI	0.677***	GFI	0.999	>0.90
	IDV	0.688***	AGFI	0.995	>0.90
	UAI	0.761***	CFI	0.999	>0.90
	IND	0.765***	NFI	0.999	>0.90
			RMSEA	0.000	<0.07
Cronbach Alpha:		0.804			
Composite reliability (CR):		0.861			
Average variances extracted (AVE):		0.590			

Notes: All variables defined in Table 1. *** significant at the 0.001 level. Goodness-of-Fit Index (GFI); Adjusted Goodness of Fit Index (AGFI); Comparative Fit Index (CFI); Normed Fit Index (NFI); Root Mean Square Residual (RMSEA).

Countries with high power distance, uncertainty avoidance, collectivism, and restraint tend to be associated with lower levels of accountability and higher levels of corruption, and thereby higher levels of tax evasion. This evidence is largely in line with previous studies on the influence of national culture on tax evasion (Ermasova et al., 2021; Richardson, 2008; Tsakumis et al., 2007).

Finally, the direct effect of national culture on tax evasion is no longer significant after controlling for IEQ as a mediator variable ($\beta = 0.054$, *ns*). As described by Baron and Kenny (1986), full mediation occurs when the direct relationship between an independent variable (NC) and a dependent variable (TE) is not significant after controlling for the relationships from NC to IEQ (mediator) and from IEQ to TE. Accordingly, IEQ fully mediates the relationship between national culture and tax evasion, which lends empirical support to H4 (see Fig. 3). Specifically, this evidence suggests that institutions can improve their

quality to lessen the influence of cultural dimensions on higher levels of tax evasion.

Moving to control variables, we find significant positive associations between the level of tax evasion and the unemployment level (UNEM), agriculture (AGR), and EU membership (EUM). This suggests the higher the unemployment rate, the higher tax evasion (similar to Torgler & Schneider, 2009; Yamen et al., 2018). Also, EU membership is highly significant at ($p < 0.001$), implying a significant difference between EU1 and EU2. Specifically, the results show that tax evasion is higher in newer EU countries (EU2), such as Romania and Greece, than in older EU countries (EU1), such as the UK. This is consistent with the findings of Yamen et al. (2018). Moreover, Table 5 shows that the time variable is highly significant in the mediation model ($\beta = 0.38$, $p < 0.001$), suggesting that the tax evasion level is decreasing over time in the EU.

4.4. Additional analysis

We extend our examination of the links among national culture, IEQ, and tax evasion to see if the relationships are the same in older and newer EU countries. Although we control for EU membership effects, the association among the study variables can still vary between countries. Previous studies (e.g., Alm & Torgler, 2006; Alon & Hageman, 2013; Yamen et al., 2018) show differences between older and newer EU countries. For example, Alon and Hageman (2013) find a high corruption level and low tax compliance in former Soviet economies. In addition, Alm and Torgler (2006) show that there is high tax compliance in several of the older EU member states. Thus, we re-run our models by splitting the whole sample into two subsamples: EU1 (pre-2004) and EU2 (post- 2004). The results, in Table 6, show a different image of the role of IEQ in older versus newer EU countries. More specifically, the full mediation effect of IEQ is evident for newer EU countries (EU2) ($\beta = -0.048$, *ns*). This suggests that newer EU countries can reduce the detrimental impact of cultural values on tax evasion by improving governance and institutional quality, indicating that effective public governance may lead to lower tax evasion. The results also indicate that IEQ partially mediates the relationship between culture and tax evasion in older EU countries (EU1). Overall, these results indicate that IEQ has a mediating effect on the relationship between culture and tax evasion levels, and this relationship is stronger in the newer EU countries (EU2). This offers new evidence suggesting that the role of the institutional environment is more prominent in newer compared to older EU countries.

In addition, to ascertain whether the NC-TE relationship can be mediated by each indicator of IEQ, we decompose the total score of IEQ into its individual dimensions of VA, PS, GE, RQ, RL, and CC (see

Table 5
Results of structural models.

Hypothesis	Description of path	Basic model	Mediation model
H1	NC → IEQ		-1.082***
H2	IEQ → TE		-0.227***
H3	NC → TE	0.164***	
H4	NC → TE		0.054
Control variables			
	AGR	0.147***	0.072***
	EAGR	0.256***	0.254***
	AGE	0.431***	0.402***
	SERV	-0.060	-0.100**
	FEMAL	0.068*	0.075**
	URBAN	0.160***	0.186***
	UNEM	0.166***	0.137***
	IMPORT	0.111***	0.148***
	LEGAL	0.176***	0.142***
	TIME (YEAR)	-0.381***	-0.385***
	EUM	0.532***	0.460***
R2		0.861	0.872
Goodness-of-fit indices			
	GFI (Goodness-of-Fit Index)	0.991	0.994
	AGFI (Adjusted Goodness-of-Fit Index)	0.930	0.949
	CFI (Comparative Fit Index)	0.996	0.999
	NFI (Normed Fit Index)	0.993	0.996
	RMSEA (Root Mean Square Residual)	0.050	0.029

Notes: * significant at the 0.05 level, ** significant at 0.01 level, and *** significant at 0.001 level. All variables defined in Table 1.

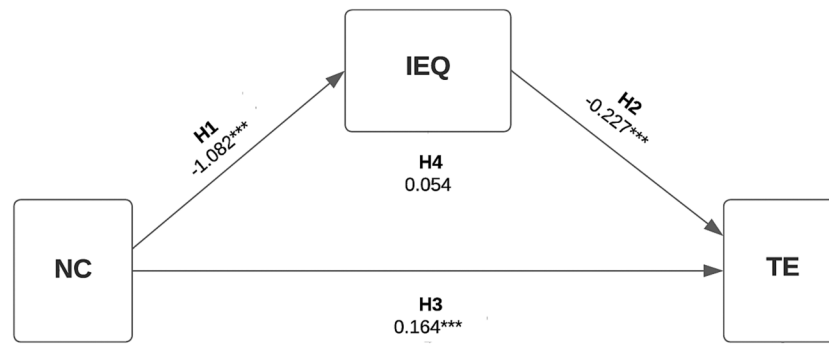


Fig. 3. SEM evaluation of the hypothesized relationships Note: *** significant at 0.001 level.

Table 6

Results of mediating relations in EU1 versus EU2 countries.

Description of path	EU1 – Model Older EU Countries		EU1 – Model Newer EU Countries	
	Basic model	Mediation model	Basic model	Mediation model
NC → IEQ		-0.021***		-0.025***
IEQ → TE		-7.878***		-7.321***
NC → TE	0.194***		0.135***	
NC → TE		0.032*		-0.048

Notes: * significant at the 0.10 level and *** significant at 0.01 level. All variables defined in Table 1.

Table 7). We find a significant negative association between tax evasion and all IEQ indicators. The rule of law (RL) has the largest impact on the level of tax evasion ($\beta -3.107, p < 0.001$), then the regulatory quality (RQ) ($\beta -3.066, p < 0.001$), and government effectiveness (GE) ($\beta -2.799, p < 0.001$). The result is consistent with prior studies (e.g., Awasthi & Bayraktar, 2015; Hofmann et al., 2014; Yamen et al., 2018), suggesting that better-ranked countries on regulatory quality and government effectiveness index show lower engagement in tax evasion. We also find that RL, RQ, and GE fully mediate the NC-TE relationship which empirically validates the argument that EU countries are more likely to rely on enhancing IEQ indicators to control the influence of culture on tax evasion. In addition, there is a partial mediating effect of control of corruption (CC) on the links between national culture and tax evasion. Finally, the results show that there is no mediation for both voice and accountability (VA) and political stability (PS).

Table 7

SEM results by individual dimensions of IEQ.

Direct and indirect effects:	Model (1) VA	Model (2) PS	Model (3) GE	Model (4) RQ	Model (5) RL	Model (6) CC
NC → VA	-0.025***					
VA → TE	-1.616*					
NC → TE	0.062***					
NC → PS		-0.004*				
PS → TE		-1.719***				
NC → TE		0.058***				
NC → GE			-0.044***			
GE → TE			-2.799***			
NC → TE			0.031			
NC → RQ				-0.027***		
RQ → TE				-3.066***		
NC → TE				0.027		
NC → RL					-0.043***	
RL → TE					-3.107***	
NC → TE					0.017	
NC → CC						-0.061***
CC → TE						-0.906**
NC → TE						0.053**

Notes: * significant at the 0.05 level, ** significant at 0.01 level, and *** significant at 0.001 level. All variables defined in Table 1.

5. Conclusion, limitations, and future research

The study examines the mediating role of the IEQ on the relationship between national culture and tax evasion. In general, the results are consistent with previous research on the ‘direct’ association between national culture and tax evasion. In addition, we find that IEQ fully mediates the relationship between national culture and tax evasion, suggesting that policymakers should aim at improving the quality of national institutions to diminish the undesirable influence of culture on tax evasion levels. Moreover, splitting the sample into older and newer EU countries shows a partial mediation effect in older EU countries and a full mediation effect in newer EU countries.

Although several studies examined the relationship between national culture and tax evasion, there is a lack of research on the mechanisms through which this influence takes place, and our study contributes to filling this gap. Our findings should motivate other scholars to examine the impact of other social and/or economic factors that can help in controlling the influence of national culture on tax evasion. Moreover, the mediating role of IEQ on the influence of culture can be also examined in contexts other than tax evasion at macro and even micro-levels.

Our results are subject to some limitations. First, our investigation is focused on the EU due to the reasons highlighted in Section 2.1. Further research can test our model on a wider scale. Second, our results should be explained considering the limitations associated with our choice of measures for national culture and tax evasion. We use Hofstede’s cultural dimensions as a measure of national culture. Other studies can use GLOBE cultural data (House et al., 2004), albeit being available for a

smaller number of countries compared to Hofstede's. Moreover, future research can utilize a different construct than the size of the shadow economy as a proxy for tax evasion levels. Finally, although we propose the IEQ as mechanisms through which policymakers can limit the impact of national culture on tax evasion, we do not claim this to be a short-term solution. The time it takes to realize a positive impact depends on various factors, including the level of tax evasion in each country and its own national culture. This issue can be investigated in future research.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

Acknowledgments:

We would like to thank the editor (Professor Robert K. Larson) and two anonymous reviewers for their constructive and detailed comments which were highly significant in developing and improving the paper.

References

- Alesina, A., & Giuliano, P. (2015). Culture and Institutions. *Journal of Economic Literature*, 53(4), 898–944. <https://doi.org/10.1257/jel.53.4.898>
- Al-Hadi, A., Taylor, G., & Richardson, G. (2021). Are corruption and corporate tax avoidance in the United States related? *Review of Accounting Studies*. <https://doi.org/10.1007/s11142-021-09587-8>
- Alm, J. (2012). Measuring, explaining, and controlling tax evasion: Lessons from theory, experiments, and field studies. *International Tax and Public Finance*, 19(1), 54–77. <https://doi.org/10.1007/s10797-011-9171-2>
- Alm, J., McClelland, G. H., & Schulze, W. D. (1999). Changing the social norm of tax compliance by voting. *Kyklos*, 52(2), 141–171.
- Alm, J., & Torgler, B. (2006). Culture differences and tax morale in the United States and in Europe. *Journal of Economic Psychology*, 27(2), 224–246. <https://doi.org/10.1016/j.joep.2005.09.002>
- Alon, A., & Hageman, A. M. (2013). The impact of corruption on firm tax compliance in transition economies: Whom do you trust? *Journal of Business Ethics*, 116(3), 479–494. <https://doi.org/10.1007/s10551-012-1457-5>
- Amable, B. (2003). *The diversity of modern capitalism*. Oxford University Press on Demand.
- Aoki, M. (2001). *Toward a comparative institutional analysis*. MIT press.
- Atwood, T. J., Drake, M. S., Myers, J. N., & Myers, L. A. (2012). Home country tax system characteristics and corporate tax avoidance: International evidence. *The Accounting Review*, 87(6), 1831–1860. <https://doi.org/10.2308/accr-50222>
- Awasthi, R., & Bayraktar, N. (2015). Can tax simplification help lower tax corruption? *Eurasian Economic Review*, 5(2), 297–330. <https://doi.org/10.1007/s40822-015-0014-9>
- Bagozzi, R. P., & Yi, Y. (2012). Specification, evaluation, and interpretation of structural equation models. *Journal of the Academy of Marketing Science*, 40(1), 8–34. <https://doi.org/10.1007/s11747-011-0278-x>
- Ballas, A. A., & Tsoukas, H. (1998). Consequences of distrust: The vicious circle of tax evasion in Greece. *Journal of Accounting, Ethics & Public Policy*, 1(4), 572–596.
- Bame-Aldred, C. W., Cullen, J. B., Martin, K. D., & Parboteeah, K. P. (2013). National culture and firm-level tax evasion. *Journal of Business Research*, 66(3), 390–396. <https://doi.org/10.1016/j.jbusres.2011.08.020>
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.
- Benkraiem, R., Uyar, A., Kilic, M., & Schneider, F. (2021). Ethical behavior, auditing strength, and tax evasion: A worldwide perspective. *Journal of International Accounting, Auditing and Taxation*, 100380. <https://doi.org/10.1016/j.intaccudtax.2021.100380>
- Bond, M. H., & Hwang, K. (1986). *The social psychology of Chinese people*. Oxford University Press.
- Brink, W. D., & Porcano, T. M. (2016). The impact of culture and economic structure on tax morale and tax evasion: A country-level analysis using SEM. *Advances in Taxation*, 23, 87–123. <https://doi.org/10.1108/S1058-749720160000023004>
- Cassar, A., d'Adda, G., & Grosjean, P. (2014). Institutional quality, culture, and norms of Cooperation: Evidence from behavioral field experiments. *Journal of Law & Economics*, 57(3 Part 1), [i]-864. <https://doi.org/10.1086/678331>
- Chaudhuri, K., Schneider, F., & Chattopadhyay, S. (2006). The size and development of the shadow economy: An empirical investigation from states of India. *Journal of Development Economics*, 80(2), 428–443. <https://doi.org/10.1016/j.jdeveco.2005.02.011>
- Daniel, S. J., Cieslewicz, A. P. J. K., & Pourjalali, H. (2012). The impact of national economic culture and country-level institutional environment on corporate governance practices. *Management International Review*, 52(3), 365–394. <https://doi.org/10.1007/s11575-011-0108-x>
- Dell'Anno, R. (2007). The shadow economy in Portugal: An analysis with the mimic approach. *Journal of Applied Economics*, 10(2), 253–277. <https://doi.org/10.1080/15140326.2007.12040490>
- Dell'Anno, R., & Solomon, O. H. (2008). Shadow economy and unemployment rate in USA: Is there a structural relationship? An empirical analysis. *Applied Economics*, 40(19), 2537–2555. <https://doi.org/10.1080/00036840600970195>
- Doupnik, T. S., & Tsakumis, G. T. (2004). A critical review of tests of Gray's theory of cultural relevance and suggestions for future research. *Journal of Accounting Literature*, 23, 1.
- Elamer, A. A., Ntim, C. G., & Abdou, H. A. (2020). Islamic governance, national governance, and bank risk management and disclosure in MENA countries. *Business & Society*, 59(5), 914–955. <https://doi.org/10.1177/0007650317746108>
- Elgin, C., & Schneider, F. (2016). Shadow Economies in OECD Countries: DGE vs. MIMIC Approaches/OECD Üyesi Ülkelerde Kayıtdışı Ekonomi: Dinamik Genel Denge ve MIMIC Yöntemleri. *Bogaziçi Journal*, 30(1), 51–75.
- Ermasova, N., Haumann, C., & Burke, L. (2021). The relationship between culture and tax evasion across Countries: Cases of the USA and Germany. *International Journal of Public Administration*, 44(2), 115–131. <https://doi.org/10.1080/01900692.2019.1672181>
- Feige, E. L. (1997). Underground activity and institutional change: Productive, protective and predatory behavior in transition economies. In *Transforming post-communist political economies* (pp. 21–35). National Academy Press.
- Feld, L. P., & Tyran, J.-R. (2002). Tax evasion and voting: An experimental analysis. *Kyklos*, 55(2), 197–221. <https://doi.org/10.1111/1467-6435.00183>
- Frey, B. S., & Torgler, B. (2007). Tax morale and conditional cooperation. *Journal of Comparative Economics*, 35(1), 136–159. <https://doi.org/10.1016/j.jce.2006.10.006>
- Gemmell, N., & Hasseldine, J. (2012). *The tax gap: A methodological review*. Emerald Group Publishing Limited.
- Gërçhani, K. (2004). Tax evasion in transition: Outcome of an institutional clash? Testing Feige's conjecture in Albania. *European Economic Review*, 48(4), 729–745. <https://doi.org/10.1016/j.euroecorev.2003.08.014>
- Gray, S. J. (1988). Towards a theory of cultural influence on the development of accounting systems internationally. *Abacus*, 24(1), 1–15. <https://doi.org/10.1111/j.1467-6281.1988.tb00200.x>
- Guillén, M. F. (2001). *The limits of convergence: Globalization and organizational change in Argentina, South Korea, and Spain*. Princeton University Press.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. (2019). *Multivariate data analysis*. Cengage.
- Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107–123. <https://doi.org/10.1504/IJMDA.2017.087624>
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*. <https://doi.org/10.1108/EBR-10-2013-0128>
- Hanno, D. M., & Violette, G. R. (1996). An analysis of moral and social influences on taxpayer behavior. *Behavioral Research in Accounting*, 8, 57–75.
- Henderson, J. V., Storeygard, A., & Weil, D. N. (2012). Measuring economic growth from outer space. *The American Economic Review*, 102(2), 994–1028. <https://doi.org/10.1257/aer.102.2.994>
- Henseler, J., Ringle, C., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hien, J. (2021). Culture and tax avoidance: The case of Italy. *Critical Policy Studies*, 15(2), 247–268. <https://doi.org/10.1080/19460171.2020.1802318>
- Hofmann, E., Gangl, K., Kirchner, E., & Stark, J. (2014). Enhancing tax compliance through coercive and legitimate power of tax authorities by concurrently diminishing or facilitating trust in tax authorities. *Law & Policy*, 36(3), 290–313. <https://doi.org/10.1111/lapo.12021>
- Hofstede, G. (1980). *Culture's Consequences—International differences in work-related values*. Beverly Hills: Sage Publications.
- Hofstede, G. (2003). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Sage publications.
- Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, 2(1), 8. <http://dx.doi.org/10.9707/2307-0919.1014>
- Hofstede, G. H. (2019). Geert Hofstede dimensions of culture. Retrieved from <https://geert.hofstede.com/landing-page/>.
- Hofstede, G. H., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* ((3rd ed.)). McGraw-Hill.
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Sage publications.
- Hutchinson, R. (2019). Culture versus structure: A critical perspective on the role of culture in tax evasion. *Accounting Historians Journal*, 46(1), 79–91. <https://doi.org/10.2308/aahj-10659>
- Jackson, B. R., & Milliron, V. C. (1986). Tax compliance research: Findings, problems, and prospects. *Journal of Accounting Literature*, 5(1), 125–165.

- Jiménez-Angueira, C. E. (2018). The effect of the interplay between corporate governance and external monitoring regimes on firms' tax avoidance. *Advances in Accounting*, 41, 7–24. <https://doi.org/10.1016/j.adiac.2018.02.004>
- Kamm, A., Koch, C., & Nikiforakis, N. (2021). The ghost of institutions past: History as an obstacle to fighting tax evasion? *European Economic Review*, 132, Article 103641. <https://doi.org/10.1016/j.eurocorev.2020.103641>
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues. *Hague Journal on the Rule of Law*, 3(02), 220–246. <https://doi.org/10.1017/S1876404511200046>
- Khlif, H., & Khlif, H. (2016). Hofstede's cultural dimensions in accounting research: A review. *Meditari Accountancy Research*, 24(4), 545–573. <https://doi.org/10.1108/MEDAR-02-2016-0041>
- Kline, T. (2005). *Psychological testing: A practical approach to design and evaluation*. Sage.
- Kountouris, Y., & Remoundou, K. (2013). Is there a cultural component in tax morale? Evidence from immigrants in Europe. *Journal of Economic Behavior & Organization*, 96, 104–119. <https://doi.org/10.1016/j.jebo.2013.09.010>
- Lanis, R., & Richardson, G. (2018). Outside directors, corporate social responsibility performance, and corporate tax aggressiveness: An empirical analysis. *Journal of Accounting, Auditing & Finance*, 33(2), 228–251. <https://doi.org/10.1177/0148558X16654834>
- Licht, A. N., Goldschmidt, C., & Schwartz, S. H. (2007). Culture rules: The foundations of the rule of law and other norms of governance. *Journal of Comparative Economics*, 35(4), 659–688. <https://doi.org/10.1016/j.jce.2007.09.001>
- Lin, K. Z., Cheng, S., & Zhang, F. (2017). Corporate social responsibility, institutional environments, and tax avoidance: Evidence from a subnational comparison in China. *The International Journal of Accounting*, 52(4), 303–318. <https://doi.org/10.1016/j.intacc.2017.11.002>
- Litina, A., & Palivos, T. (2016). Corruption, tax evasion and social values. *Journal of Economic Behavior & Organization*, 124, 164–177. <https://doi.org/10.1016/j.jebo.2015.09.017>
- Medina, L., & Schneider, F. (2018). *Shadow economies around the world: What did we learn over the last 20 years?* International Monetary Fund Working Papers. Retrieved from <https://www.imf.org/en/Publications/WP/Issues/2018/01/25/Shadow-Economies-Around-the-World-What-Did-We-Learn-Over-the-Last-20-Years-45583>.
- Merritt, A. (2000). Culture in the cockpit: Do Hofstede's Dimensions replicate? *Journal of Cross-Cultural Psychology*, 31(3), 283–301.
- Messner, S. F., & Rosenfeld, R. (2012). *Crime and the American dream*. Cengage Learning.
- Moussa, T., Allam, A., Elbanna, S., & Bani-Mustafa, A. (2020). Can board environmental orientation improve U.S. firms' carbon performance? The mediating role of carbon strategy. *Business Strategy and the Environment*, 29(1), 72–86. <https://doi.org/10.1002/bse.2351>
- Moussa, T., Allam, A., & Elmarzouky, M. (2022). Global modern slavery and sustainable development goals: Does institutional environment quality matter? *Business Strategy and the Environment*, 31(5), 2230–2244. <https://doi.org/10.1002/bse.3018>
- Nelson, J. M., Tilly, C., & Walker, L. (1997). *Transforming post-Communist political economies. Task Force on Economies in transition*. Washington, DC: National Academy Press.
- Newman, K. L., & Nollen, S. D. (1996). Culture and congruence: The fit between management practices and national culture. *Journal of International Business Studies*, 27(4), 753–779. <https://doi.org/10.1057/palgrave.jibs.8490152>
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.
- North, D. C. (2005). The contribution of the new institutional economics to an understanding of the transition problem. In . Unu-Wider, (Ed.), *Wider Perspectives on Global Development* (pp. 1–15). Springer.
- Pejovich, S. (1999). The effects of the interaction of formal and informal institutions on social stability and economic development. *Journal of Markets & Morality*, 2(2), 164–181.
- Putnam, K., Abdelfattah, B., Bagchi, K., & Braun, G. P. (2016). Tax compliance and international cultural factors: A multilevel empirical study. In P. Mandal, & J. Vong (Eds.), *Smart Technologies for Smart Nations* (pp. 19–30). Springer.
- Richardson, G. (2006). Determinants of tax evasion: A cross-country investigation. *Journal of International Accounting, Auditing and Taxation*, 15(2), 150–169. <https://doi.org/10.1016/j.intaccudtax.2006.08.005>
- Richardson, G. (2008). The relationship between culture and tax evasion across countries: Additional evidence and extensions. *Journal of International Accounting, Auditing and Taxation*, 17(2), 67–78. <https://doi.org/10.1016/j.intaccudtax.2008.07.002>
- Schneider, F., & Buehn, A. (2012). Shadow economies in highly developed OECD countries: What are the driving forces?. Retrieved from *IZA Discussion Paper No., 6891* <https://ssrn.com/abstract=2161228>.
- Schuler, R. S., & Rogovsky, N. (1998). Understanding compensation practice variations across firms: The impact of national culture. *Journal of International Business Studies*, 29(1), 159–177. <https://www.jstor.org/stable/155593>.
- Scott, W. R. (1995). *Institutions and organizations. Foundations for organizational science*. Thousand Oaks, CA: Sage Publications.
- Scott, W. R. (2013). *Institutions and organizations: Ideas, interests, and identities*. Sage Publications.
- Smatrakalev, G. (1998). Walking on the edge: Bulgaria and the transition to a market economy. In R. W. McGee (Ed.), *The ethics of tax evasion* (pp. 316–329). Dumont, NJ: The Dumont Institute for Public Policy Research.
- Strange, R., Filatotchev, I., Buck, T., & Wright, M. (2009). Corporate governance and international business. *Management International Review*, 49(4), 395–407. <https://doi.org/10.1007/s11575-009-0001-z>
- Taras, V., Rowney, J., & Steel, P. (2009). Half a century of measuring culture: Review of approaches, challenges, and limitations based on the analysis of 121 instruments for quantifying culture. *Journal of International Management*, 15(4), 357–373. <https://doi.org/10.1016/j.intman.2008.08.005>
- Thomas, M. A. (2010). What do the worldwide governance indicators measure? *The European Journal of Development Research*, 22(1), 31–54. <https://doi.org/10.1057/ejdr.2009.32>
- Torgler, B. (2003). Does culture matter? Tax morale in an East-West-German comparison. *FinanzArchiv: Public Finance. Analysis*, 59(4), 504–528. <https://www.jstor.org/stable/40913019>.
- Torgler, B., & Schneider, F. (2009). The impact of tax morale and institutional quality on the shadow economy. *Journal of Economic Psychology*, 30(2), 228–245. <https://doi.org/10.1016/j.joep.2008.08.004>
- Tsakumis, G. T., Curatola, A. P., & Porcano, T. M. (2007). The relation between national cultural dimensions and tax evasion. *Journal of International Accounting, Auditing and Taxation*, 16(2), 131–147. <https://doi.org/10.1016/j.intaccudtax.2007.06.004>
- Vaguine, V. V. (1998). The "Shadow Economy" and tax evasion in Russia. In R. W. McGee (Ed.), *The ethics of tax evasion* (pp. 306–314). Dumont, NJ: The Dumont Institute for Public Policy Research.
- United Nations. (2022). *Human Development Index*. United Nations: In Human Development Reports. Retrieved from <https://hdr.undp.org/data-center/human-development-index>.
- Wahl, I., Kastlunger, B., & Kirchlner, E. (2010). Trust in authorities and power to enforce tax compliance: An empirical analysis of the "Slippery Slope Framework". *Law & Policy*, 32(4), 383–406. <https://doi.org/10.1111/j.1467-9930.2010.00327.x>
- Wallschutzky, I. G. (1984). Possible causes of tax evasion. *Journal of Economic Psychology*, 5(4), 371–384. [https://doi.org/10.1016/0167-4870\(84\)90034-5](https://doi.org/10.1016/0167-4870(84)90034-5)
- Witte, A. D., & Woodbury, D. F. (1985). The effect of tax laws and tax administration on tax compliance: The case of the US individual income tax. *National Tax Journal*, 38(1), 1–13. <https://doi.org/10.1086/NTJ41791992>
- World Bank. (2019). *DataBank—The World Bank*. Retrieved from <https://databank.worldbank.org/home.aspx>.
- Yamen, A., Allam, A., Bani-Mustafa, A., & Uyar, A. (2018). Impact of institutional environment quality on tax evasion: A comparative investigation of old versus new EU members. *Journal of International Accounting, Auditing and Taxation*, 32, 17–29. <https://doi.org/10.1016/j.intaccudtax.2018.07.001>
- Zeng, T. (2019). Country-level governance, accounting standards, and tax avoidance: A cross-country study. *Asian Review of Accounting*, 27(3), 401–424. <https://doi.org/10.1108/ARA-09-2018-0179>