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Assessing Corruption in Times of Crisis: Empirical Evidence from Greece

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ABSTRACT

The goal of this paper is to provide an overall presentation of corruption as occupational fraud building on the findings of an empirical study conducted in Greece. As uncertainty leads to increased levels of corruption, Greece was chosen due to the prolonged period of uncertainty the country faces, caused by the 2010 financial crisis and followed by the Covid pandemic crisis. 400 questionnaires reviewing corruption perception were gathered and analyzed by gender, age, marital status, education level, position, occupation, and monthly income, as well as urban vs rural area of residence. The findings of the study were compared with and critically evaluated against those of the previous studies for Greece. Respondents in age group 36-49 believe that if appropriate measures are taken it is possible to tackle corruption in the public sector, in contrast to people aged 18-35 who disagree completely. Residents of rural areas do not consider corruption to be a serious problem and are more willing to whistleblowing (in contrast to residents of urban areas). The study findings have important practical implications in the context of designing effective corruption reduction policies.

KEYWORDS

Corruption; occupational fraud; crisis; regions; whistleblowing; digitalization

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1. Introduction

Corruption is a perennial problem that concerns all countries of the modern world, mainly because of its impact on social, political, and economic life. Corruption has a negative impact on both the private and public sectors of a country, affecting its economic development and its growth in general. It increases costs and uncertainty, acts negatively on investment and in this way, it also negatively affects GDP per capita, growth rates and thus contributes to the reduction of public spending on health and education. Contemporary literature places particular emphasis on identifying the characteristics that increase corruption to design effective policies to reduce it. The World Economic Forum estimates that the cost of corruption is at least \$2.6 trillion - or 5% of the global gross national product.

The goal of this paper is to provide a coherent introduction to corruption as occupational fraud, including the theoretical background of the concept (i.e. definitions and key issues, the types of corruption, its main forms, the ways it can be carried out, the main anticorruption measures used, etc.) as well as to further exploit on the corruption phenomenon in times of crisis, presenting the findings of an empirical study conducted in Greece. As uncertainty leads to increased levels of corruption, Greece was chosen due to the prolonged period of uncertainty caused by the 2010 financial crisis, which was followed by the Covid pandemic crisis.

In the empirical study, "perception of corruption" was chosen as the topic of investigation because, despite the technological developments that have occurred in the public and private sectors and continue to occur in all sectors of society, people and their beliefs still remain one of the most important factors in the operation and achievement of the objectives of any organization as well as in the production, efficiency and distribution of wealth in civil society in general. As analysed in Boufounou & Avdi (2016), financial crisis affected public sector performance in Greece. Greece was chosen for the study of this issue, for an additional reason, because due to the recent financial crisis corruption has been maintained at a high level in absolute terms. According to many researchers, this is attributed to the lack of social standing of public sector staff, their low salaries, working conditions, lack of digital technology, etc. The aim of this research is to establish the relationship between corruption and the economic crisis, to identify whether there is a similarity or difference in the perception of corruption between residents in urban areas and in the periphery (rural areas) and also to show the proposed ways of tackling corruption, with an emphasis on the contribution of the use of "e-government".

This particular empirical study confirmed the serious impact that the crisis had on the spread of corruption. The study indicated main differences in corruption perception based on age. Further, the study highlighted key differences between residents of rural and urban areas. Residents of rural areas do not consider corruption to be a serious problem and are more willing to whistleblowing (in contrast to residents of urban areas). Finally, the study indicated that the factors affecting corruption in times of crisis in developed countries tend to assimilate to those affecting developing countries and respectively to the suggested anti-corruption measures to be implemented. These findings have important practical implications in the context of designing effective corruption reduction policies.

The paper is organized as follows: First, the definition, the main concepts and issues of corruption are presented. A critical discussion of the main findings of the empirical research conducted for Greece follows. Finally, recommendations for preventing and or mitigating corruption are discussed accompanied by suggestions for future research and conclusions.

2. Theoretical Background

2.1. Concept Evolution

Occupational Fraud is defined in a variety of ways in literature. According to IIA (2019) it is defined as «any illegal act characterized by deceit, concealment, or violation of trust», while according to ACFE (2022) “occupational fraud refers to frauds that are committed by individuals against the organizations that employ them and is very likely the costliest and the most common form of financial crime in the world”.

According to the "Fraud Triangle" (Cressey 1950; Wells, 2011; Garefalakis et al, 2016), the three elements that define the act of occupational fraud are: pressure, opportunity, and rationalization. As noted in Kagias et al (2022), the Fraud Triangle has been incorporated to the International Standards of Audit (ISA 240), according to which «fraud involves incentive or pressure to commit fraud, a perceived opportunity to do so and some rationalization of the act». Wolfe & Hermanson (2004) amended the “Fraud Triangle”, adding the element of “capability” as the 4th element. “Capability” refers to the unique ability of a person to commit fraud (based mainly on his position within the organization, his understanding of accounting and other systems and databases used by the organization as well as internal control vulnerabilities, his belief that fraud will go undetected, and his ability to act under pressure, as described by the Systems Theory by Bello (1985).

ACFE (2022) surveyed 2,100 cases of 133 countries that caused total losses of more than \$3.6 billion (i.e., \$ 1,783.000 average loss per case) indicated that the three main categories of occupational fraud are:

- *Asset Misappropriation*, that entails an employee stealing or misusing the employer's resources (for example, improper expense reimbursements or misuse of government assets, etc.) is the most prevalent but has the lowest average cost per case.
- *Financial Statement Fraud*, that entails a material misstatement or misrepresentation in the organization's financial statements (fraud is not due to misstatements or accounting errors but is the intentional misrepresentation of financial statements by managers to mislead interested shareholders, creditors, etc.) are the rarest (5%) but most expensive, e.g. the Siemens case as analyzed by Blanc et al (2019). Agyei-Mensah (2017) analyzed the impact of corporate governance factors on transparency and disclosure of forward-looking information and showed that the least corrupt a country is, the more forward-looking information are disclosed by its listed companies, confirming the relationship between the transparency level of a country and the transparency level of the listed firms in that country.
- *Corruption*, that involves crimes like bribery, extortion, etc. (which includes all the offenses listed as "Service Crimes" in Greek Criminal Code Articles 235-263, such as breach of duty, false certification) is in the middle in terms of frequency (50%) and losses, respectively. In a case of occupational fraud, more than one of the above categories may coexist. Given that according to ACFE (2022) corruption fraud alone occurs with a frequency of 12%, together with Financial Statement Fraud with a frequency of 1%, while the frequency of occurrence of all three categories together is 5%, its particular importance becomes evident, which is why this paper focuses on the study of corruption.

Corruption, according to Transparency International, is defined as "the abuse of entrusted power for private gain." According to Langseth (2003), there is no single and comprehensive definition of corruption. Although the definition of corruption includes the private sector, in general Corruption is considered to refer to the abuse of the position held by a person who is within the public administration or of the relations he or she maintains with it, with the purpose of securing an undue advantage for himself or herself or for a third part.

Corruption is associated with economic growth. According to ACFE (2022), levels of occupational fraud rise in times of economic crisis, instability, and recession because heightened demands sometimes lead to workers engaging in fraudulent behavior. According to Drakoulis and Katsani (2020): a) occupational fraud risk factors increase during a crisis because companies and individuals face greater financial pressures, b) the opportunity for occupational fraud increases if key internal controls weaken, and c) people find it easier to rationalize their actions; thus, the Fraud Triangle is present during crises (hence cyber-fraud increased during the pandemic).

European Parliament (1995) defined “corruption as the behavior of persons with public or private responsibilities who fail to fulfil their duties because a financial or other advantage has been granted or directly or indirectly offered to them in return for actions or omissions in the course of their duties”, while World Bank (2020) defined it as “the abuse of public office for private gain”.

Although the definition of corruption includes the private sector, corruption is generally considered to refer to the abuse of the position held by someone within the public administration or of the relations with it, with the aim of securing an undue advantage for himself or herself or for a third part. Indeed, in some countries, senior government officials have such a broad scope of action and such strong political power that the 'red line' separating legality from illegality is indistinguishable.

Corruption can develop in different *environments*. Moreover, although in many cases it facilitates the development of criminal activity (e.g., money laundering, drug trafficking, etc.), it is not limited to governmental echelons, but may also extend to other criminal organizations and activities. Corruption in the *international environment* takes place between two or more International Organizations or between an International Organization and a domestic Organization (public or private); hence is directly related to the extent to which the internal actors (politicians and public officials) of a country are prone or not to allow corruption to occur in their country. In the *private sector*, it takes place corruption takes place when an employee or a manager (e.g. in the banking sector) who exercises influence over a particular function or process assigned to him/her in the undertaking in which he/she is employed, acts contrary to the obligations of his/her job and harms (directly or indirectly) the undertaking for the benefit of himself/herself or another third part. In addition to the damage caused to the directly affected company or organization, corruption in the private sector also has a negative impact on the economic development of a country, i.e., by providing falsified information to the tax authorities, it reduces the State's revenues, creates uncertainty for investors and drives the State's economic policy off target. In the *public sector*, corruption takes place between two public officials or between a private individual and a public official. Each party involved uses its power illegally to serve their own individual interests. Depending on the position held by the public official involved, it can be divided into:

- *Political*: it occurs at the highest levels of political authorities (Holmes, 2006), i.e., heads of state, ministers, top civil servants, etc. It exists at the highest levels of power and evolves between the executive, legislative and judicial branches of a government. This phenomenon occurs when people's behavior deviates from moral values and universal principles; when individual interests prevail, and common interests are displaced.
- *Bureaucratic*: it takes place in the day-to-day service delivery phase of the public sector, local authorities, and public and private legal entities (NPOs), i.e., the issuance by the public sector of a photographic provision of a law, a photographic notice for a job vacancy and often occur in privatizations, public tenders, the issuance of favorable court decisions, etc.

According to Reppas (2010), *depending on its size* corruption is divided in two categories: *Grand*, when the amounts of money involved are "particularly high" (related to the economic size of a country, the actors or individuals involved) and the transactions relate to elected politicians, senior civil servants of national and local administrations, top officials, political parties, multinationals, and large domestic companies of private interests. It is mainly evidenced in the areas of public works and procurement, as well as in the areas of organized crime, arms trafficking, drug trafficking, etc (Karkatsoulis, 2005). *Petty*, when related to small amounts of money and to the fulfillment of small favors. It occurs mostly in the lower levels of the public administration and/or in individual citizens, small and medium-sized enterprises, and low-income and low-reputation individuals who seek preferential treatment, particularly at the level of services (Karkatsoulis, 2005) where large-scale bribery has been recorded. Despite its size, it is harmful. Petty corruption is often identified with bureaucratic corruption.

According to Reppas (2010), corruption *in terms of its frequency* is divided into *low frequency or sporadic*, when

it involves acts of corruption that take place at irregular intervals in an environment that is generally regarded as incorruptible; and *high frequency or systematic* when it involves many acts of corruption taking place by a large number of individuals within a socio-political environment which is characterized as corrupt.

Other *common distinctions* of corruption are:

- *Supply corruption* (used to describe the act of offering an illegal payment or undue advantage); and *Demand corruption* (referring to the acceptance or solicitation of such a payment or advantage). *Active and Passive corruption* are terms that have been used synonymously with supply and demand corruption. The objectives of bribery transactions vary: to achieve a specific purpose, to influence (positively or negatively) future decisions, to retain some power(s), to confer rights of public interest, or for some simple convenience (Saladin,1999). Argandona (2005), provided an extensive analysis of bribery from the point of view of the company that makes the payment. According to the Greek Criminal Code (Articles 235 & 236) both active and passive bribery are punished in Greece, as in most EU countries. Each type of bribe, however, has different consequences depending on the level at which the transaction takes place.
- *Conventional corruption* (occurs when government officials, whether higher or lower, hold or withhold unfair advantages for their personal use, disregarding the public interest); and *Unconventional corruption* (occurs when a public or government official acts without regard to the public interest, with the aim of achieving a specific and personal gain). A key feature of conventional corruption is reciprocity: both the offer and acceptance of bribes (supply and demand bribes). A key feature of unconventional corruption is that there is no reciprocal relationship, as there is no clear transaction between the two parties and includes acts such as embezzlement, theft, misappropriation, and breach of trust.
- *Centralized corruption* (involves bribery where the bribing citizen pays a specific public official or representative of a public body to execute an agreement); while *Decentralized corruption* (where more than one person taking a bribe is involved) according to Skiadas (2005).
- Based on the degree of perception, tolerance, and appreciation of the need to punish corruption by society, corruption is categorized as *Black, White, and Grey*, according to Heidenheimer & Johnston (2001).
- Based on its extent, corruption is divided into: *Subconscious corruption* (which is usually low frequency and does not cause significant imbalances in the originating organization/public service, nor in the citizen/business/organization that participates as a bribe taker to gain or facilitate); and *Pervasive corruption* (which extends across the board to both senior and junior levels of government and management and causes serious financial consequences for the organization itself, or for society; and *Destructive corruption*, which essentially paralyses every administrative function of the state and causes disastrous effects on the national economy itself) as noted by Dimant (2013) ; Dimant & Tosato (2017).

Corrupt acts *can be carried out by Commission but also by Omission*. A public official may either fail to act or act in the performance of his or her duties in exchange for the benefit of an individual or a business. These factors, as well as the "degree of coercion" applied by the public official and the type of "reward" (monetary, physical good, or creation of a social obligation), are important as they may influence corruption decision-making.

According to Gofa (2008) *the main forms* of corruption could be summarized as follows:

- *Economic corruption/Bribery* is an instantly recognizable form. It is defined as the phenomenon of inducing monetary corruption to favor someone and satisfy his request, without fulfilling the conditions required by law, and at the same time obtaining an illegal financial benefit. Most national, European, and international organizations involved in the fight against corruption have focused their attention mainly on economic corruption. Bribery (or Facilitating Payments) is the most frequently observed form of corruption worldwide and is carried out with the aim of obtaining or providing a benefit from an act, decision, action, or deliberate inaction. According to World Bank, businesses and individuals pay more than \$1 trillion in bribes every year.

The most common forms of bribery are the offer or acceptance of gifts, favors or some kind of favor in the private sector (e.g. a bribe from a banking executive to issue a loan without meeting the necessary conditions); and in the public sector for participating in fraud (e.g. bribing public officials to participate in the misuse of public money), undue influence (e.g. access to government decision-making processes), avoidance of tax obligations, avoidance of criminal liability, and access allowance to inside information of a confidential nature, securing an unfair advantage in profits or available resources (e.g. bribing a public sector official to ensure that an order is placed by the bribing supplier).

- *Nepotism, familism, or favoritism* is the exploitation by someone of the position or office they hold in the public or private sector to favor relatives, close friends, or acquaintances from political parties, religious organizations, or other interest groups and to grant them positions of power by circumventing meritocracy. This phenomenon is more common in religion and politics.
- *Collusion* occurs to manage information to the detriment of a social, political, or economic entity. Collusion usually develops between two contracting parties and can alter a situation that was originally considered nonnegotiable (such as security conditions) by turning it into a negotiable one, for the benefit of oneself or third parties. During collusion, the contracting parties generally manage to avoid sanctions and/or regulations by bribing officials.
- *Embezzlement* is a criminal offense that affects the value of a property, defined as the 'appropriation' (in whole or in part) of a foreign movable object or good which comes into the possession of the offender in any way and takes the forms of Theft (when the offender takes the good himself from the possession of a third part i.e., person, business, etc.) and Abuse, which is the unlawful diversion of goods for private use. This study focuses on the abuse of trust (e.g., of citizens when state bodies abuse their rights for personal gain) and on the misappropriation of money (e.g., from a public fund), as well as the abuse of power entrusted by the state to a particular person and that person, uses it for his or her own benefit. A common example of abuse of power is the misuse of power in the public sector or the forfeiture of law enforcement services due to political interference. Abuse of power occurs mainly in bureaucratic management systems, i.e., where the top executive has a high degree of discretion in decision-making and there are no structures for transparency and accountability. It is often associated with complex rules where the decision-making process is complicated, thereby negating the effectiveness of the statutory provisions. The systematic abuse of power at global, international, and national levels in the form of international laws, standards, or even norms in all aspects of power is striking.
- *Extortion* is the coercive, illegal acquisition of money, goods, or other benefits to provide a service or avoid a penalty, involving two parties. One part exerts pressure to achieve its ends, while the other part retreats in fear of the possible consequences. The 'blackmailer' puts forward his demands and needs to make sure that he achieves what he wants and often uses psychological pressure by threatening that unpleasant consequences will follow if he fails. He may also use bribery, promising rewards, or alternatively threatening to punish his "victim" (person/business) if he does not meet his demands for cooperation, by using physical violence, disclosing damaging information that will cause him moral or financial harm, etc. Senior public sector executives or political actors may engage in acts of blackmail, but they can equally become victims of blackmail themselves. Extortion often differs from bribery in the degree of pressure exerted on the 'victim', e.g., when a doctor asks for extra money for a simple medical case, it is considered a bribe. But if the same doctor asks extra money for a serious health or death issue of his patient, then it falls into the realm of extortion.

There are other crimes linked to the concept of corruption, the main ones being:

- *Forgery*: the word is etymologically derived from "forge"/"mould" and "writing" and refers to the act of putting a forged signature on a document or creating a fake or forging a genuine document, e.g., if the perpetrator

prepares a document from the outset and presents it as having been prepared by another person or if he/she falsifies a genuine document.

- *Smuggling*: defined as any form of trade carried out in violation of the law with the aim of attempting to evade or avoid the obligation to pay customs duties by illegal acts and/or omissions, often with the involvement of law enforcement agencies. In essence, it is a criminal tax offense that occurs during the import/export of certain goods.
- *Tax offenses*: any form of taxation imposed by the State provokes the reactions of taxpaying individuals and businesses who, to be able to cope with it, "react" mainly by tax planning, by shifting the tax burden, by tax evasion or tax avoidance, etc. In particular:
 - *Tax avoidance* is a series of well-planned accounting actions been developed after a thorough study of tax and commercial legislation and practice, court decisions, ministerial decisions, etc. to determine, within the framework of the law, the least possible imposition of tax on a natural or legal person and/or to achieve the complete avoidance of taxation.
 - *Tax evasion* is any illegal act or omission on the part of a taxpayer seeking to reduce his tax burden or to avoid payment of the tax assessed against him. Tax evasion should not be confused with tax avoidance because it is a violation of the provisions of the tax laws. It is a complex phenomenon that does not depend purely on economic or fiscal factors but also on other factors such as the ethics of economic policymakers, therefore, requiring system and planned action to deal with it. It usually finds fertile ground in economies where there is an "underground/shadow" economy, a high proportion of self-employed, a low level of public service provision, and very high tax rates.

Corruption is a global phenomenon, one of its key characteristics being that it leaves no easily traceable fingerprints. Although it is possible to assess a situation, it is generally not possible to quantify the full extent of the problem. For this reason, quantitative assessments are mainly based on sample surveys (and opinion polls) on perceptions/experiences of corruption and often in combination with expert assessments (which are also based on surveys). Although their reliability has often been questioned (as being affected by errors in sampling methodology, inaccuracies in measurement, and weaknesses in the identification of the sector where corruption is taking place, its type or form, etc.) they are still useful.

2.2. Corruption Measurement

Based on the conceptual approach to the term corruption, people resort to acts of corruption motivated by behavioral motives like the "thirst" for power, greed for money, need to improve wages, anxiety about paying off debts, sympathy for a relative or friend, or, conversely, dislike of government policy, etc. However, when the holder of a position has monopoly power, increase the chances of resorting to acts of corruption due to these behavioral motives. As Kiltgaard (1998) argues, for an act of corruption to be pursued and have a positive outcome for the perpetrator, 3 conditions must be met:

- the monopolistic economic advantage to be high,
- the task power to be is high, and
- the stringency of the corruption control rules to be low

$$Cor = R + D + A \quad (1)$$

where: Cor: corruption, R: economic rent, D: discretionary power, A: accountability.

At macroeconomic level corruption, according to Treisman (2000), is a function related to the economic growth of a country (i):

$$Cori = f (Ci, Ecdi) \quad (2)$$

where: Cor_i : corruption in country I, C_i : cultural attributes of country I, Ecd_i : economic development of country i

According to Mauro (1995), the economic growth of a country is a function of the existing corruption in that country and according to Acemoglu et al (2001), there is a correlation between corruption and the human capital of its inhabitants and the level of institutions in that country.

Mocan (2008) expressed the view that corruption can be considered as a function with the following form:

$$Cori = f (Ci, Hi, Ki) \quad (3)$$

where: C_i : cultural attributes of country I, H_i : human capital of country I, K_i : institutional characteristics of country i.

This function at the microeconomic level, influenced by the individual characteristics of the person (j) becomes:

$$Corij = f (Ci, Hi, Ki, Xij) \quad (4)$$

where: Cor_{ij} : corruption, of person j in country I, X_{ij} : personal characteristics of person j in county i.

According to Charon (2016) there is a kind of correlation between perceptions of corruption and actual experiences of corruption. For example, when the public or firms believe that corruption is widespread, this fact alone can be a significant barrier to investment, exacerbating the impact of corruption on the economy. In this regard, it is noted that the Eurobarometer 2022, studying business attitudes towards corruption in the EU, concluded that:

- 34% of enterprises stated, in the context of their business activities, that corruption is a problem for them (75% for Greece)
- % of businesses stated that there is widespread corruption in their country (90% for Greece)
- 30% of companies participating in public tenders or public procurement think that corruption has prevented them from winning a public tender or a public procurement contract in the last three years (47% for Greece)
- 34% of companies agreed that patronage and nepotism hinder business competition in their country (68% for Greece)

Corruption, according to Ploumi (2014), is mainly monitored by the following indicators:

- The *Bribe Payers Index (BPI)*, based on surveys of a "special" population, is implemented by Transparency International (TI), a non-governmental organization founded in 1993 by Peter Eigen and dedicated to fighting corruption worldwide. It was first published in 1999 and in 2011, it managed to cover 28 countries around the world. The surveys take place among top executives (banks and companies) in the host countries. This indicator shows how much the ability of large companies to bribe the institutions of less developed countries increased.
- The *World Competitiveness Report*, published annually by the World Economic Forum, presents data on the phenomenon of corruption and in particular bribery. The results of this study are based on responses from senior managers of companies, collected in the context of an opinion survey and then weighed to take account of the sample size.
- The *Business International (BI) Index* is compiled by the Economic Intelligent Unit and includes an assessment of the level of corruption in various countries around the world. It is extracted from data collected by a network of correspondents and analysts around the world.
- The *International Country Risk Guide (ICRG)* published by "Political Risk Services Inc.", analyzes financial and political risks for 140 countries of the world.
- The *Global Corruption Barometer (GCB)* provides comparative tables measuring public opinion. It is a survey

conducted annually by Transparency International (TI) of 114,000 people in 107 countries around the world with a typical sample size/country of 1,000 people (with a margin of error of around 3%) and captures public perceptions of corruption by institution: Prime Minister, Police, National Government Officials, Local Government Representatives (including Mayors), Members of Parliament, Judges and Magistrates, Business Executives Bankers, NGOs. It also records the reasons why citizens bribe (public schools, public clinics or hospitals, identity documents, social security benefits, policy issues)

- The *Control of Corruption Index (CCI)*, compiled by The World Bank as part of the Global Governance Indicators and released every 6 months since 1996. It is a multi-component index based on several hundred variables on perceptions of governance, obtained from thirty-one (31) different data sources. It treats public sector corruption as a single homogeneous phenomenon and draws data from individuals and institutions other than the World Bank. Index values range between [- 2.5, + 2.5] with the highest value (+2.5) indicating zero corruption.
- The *Corruption Perceptions Index (CPI)*, which is also a multi-component index, compiled by Transparency International (TI) since 1995, on an annual basis, measures the level of perceived corruption by citizens in the public sector of a country. It is derived from surveys that record the perceptions of the business community and expert analysts. Since 2012, it has received values ranging between [0, 100], with the highest value indicating zero corruption. It is calculated using twelve data sources from eleven different institutions and captures perceptions of Corruption over the past two years. It is based on thirteen individual surveys and currently covers 182 countries in total. This index has been subject to much criticism and has often been a subject of controversy between its supporters and critics, e.g., Yuliya (2012) in her comparative study, demonstrated misconceptions created by the CPI. Also, some of the experts of Transparency International described the CPI as "biased" as the use of the index sometimes, particularly when used as a measure of a country's actual levels of corruption, raises interpretive issues. In particular:
 - *Issues of research methodology:* due to the lack of a single definition of Corruption worldwide, the measurement of different forms of corruption, the measurement of absolute levels of corruption regardless of the size of countries, and the conclusion of a complex indicator referred to as the component of many different forms of Corruption.
 - *Issues of information provision* that can be considered as biased: information from corrupt SMEs or from information sources of dubious quality in each country e.g., court decisions from countries showing few convictions in a corrupt state versus more convictions in a less corrupt state or from the expression of biased opinions by independent persons whose opinions are influenced by subjective characteristics.
 - *Issues relating to the ranking of countries in the Corruption Tables:* although a country's index may show an improvement over previous years, due to the general improvement in the index, on average the country appears worse off than in previous years.

3. Methodology and Results

Greece has shown a steady improvement according to the Corruption Perception Index of International Transparency. Specifically, in 2021 it was in 58th position with 49 points, in 2020 in 59th position with 50 points and in 2019 in 60th position with 48 points (out of 180 total positions), while in the previous year 2018, it was in 67th position with 45 points, a fact attributed by many scholars to the reforms implemented to combat fraud and corruption. These include the establishment of the National Transparency Authority (NTA), which was described, by the European Commission's 4th Enhanced Supervision Report (2019), as a positive structural reform towards enhancing the effectiveness of control mechanisms, taking initiatives in the areas of prevention, and raising

awareness in society.

3.1. Empirical Evidence

The empirical research took place in the period from January 2020 to April 2020. 400 questionnaires were gathered and examined in total. 126 of them were delivered and collected by hand, while 274 were collected online using Google forms. The questionnaire used in addition to the demographic/professional data of the participants (gender, age, marital status, education level, position, occupation, monthly income) had 77 "closed" type questions (which are easier to answer, code, analyze quantitatively and increase the willingness to participate and the objectivity of the questionnaires) and 2 "open" type questions (giving the respondents the opportunity to freely express their opinion), to foster a kind of creative dialogue between respondent and researcher, to enhance the generation of qualitative responses and to assess their intentions to highlight incidents of corruption/whistleblowing), divided into 3 parts in order to identify current perceptions of corruption, to explore the relationship between corruption and the economic crisis and to assess alternative measures to combat it, with emphasis on the contribution of digitalization and e-government. The population of the present study consists of permanent residents of Urban areas (the urban centers of Greece, i.e., major large cities Athens and Thessaloniki) and Rural Areas (other areas/cities). This is the first study that records and compares corruption perception issues in Greece between these categories. A five (5) point Likert scale was used for the measurements. The sample was processed using the statistical analysis package "SPSS 25".

The survey (as presented in the Questionnaire in Appendix I) studied:

- the perceptions of the existence of corruption.
- the areas where corruption occurs.
- the seriousness of the various acts of corruption
- the factors contributing to/hindering the phenomenon of corruption.
- the contribution of corruption to the economic crisis phenomenon.
- the contribution of digitalization to the fight against corruption.
- the alternative measures to combat corruption.
- the whistleblowing intention.

The sample characteristics are presented in Figure 1 below.

3.2. Main Findings

The basic statistics of the main questions on the perceptions addressed are presented in Table 1 that follows:

Table 1. Basic Statistics.

	Min	AVG	Max	Std. Deviation
Corruption is an important problem in Greece	2.00	3.71	5.00	1.21
Government and the public sector are more corrupt than the private sector	1.00	3.04	5.00	1.24
Personal contacts/relationships are very important to satisfy any request to the public sector	1.00	3.25	5.00	1.27
Whistleblowing willingness	1.00	3.55	5.00	1.25

The main findings of the survey are summarized as follows:

It has been shown that *corruption is a real problem in Greece* for 66% of the total sample (68% of men & 64.3% of women, *in terms of gender*). This is in line with the findings of Ploumi (2014), - that was estimated 61.51%- and of Avdoulou (2017) that was estimated 78%. The climax of 2018 that was followed by an improvement in our study,

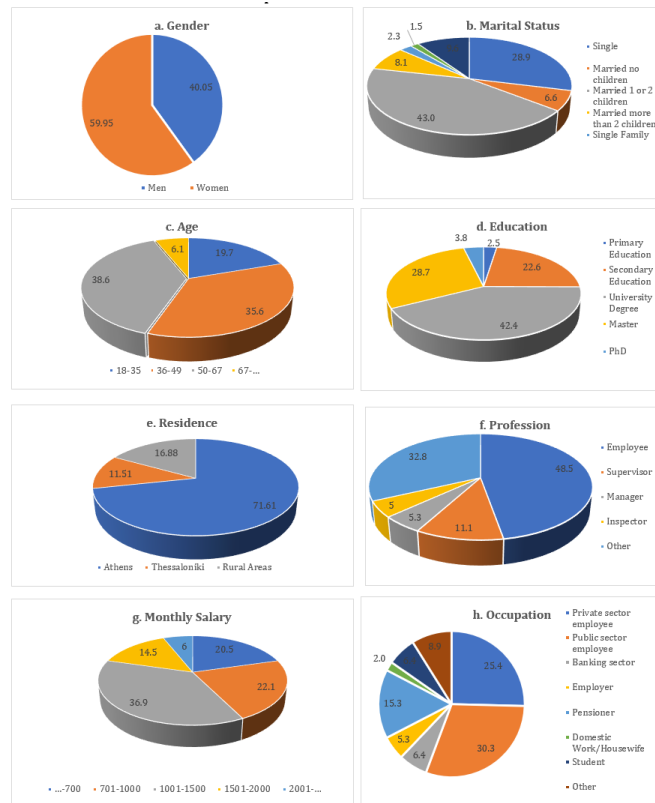


Figure 1. Structural Characteristics.

could be explained by the financial crisis climax of Greece in 2018 and the relating improvement afterwards. It is also evidenced that *residents of urban areas* consider corruption a real problem, as opposed to residents of rural areas. Furthermore, in *terms of age span*, those aged over 67 years (82.6% of them) and those aged 18-35 (70.5% of them) considered corruption as a major problem. *In terms of educational level*, 80% of PhD holders and 66.4% of master's degree holders, considered corruption as a major problem, while *in terms of family status* it was considered as such by 77.8% of those belonging to single-parent families and 73.1% of married couples without children. *In terms of employment* 80.9% of employers and 72.9% of pensioners and 68.4% of managers, 62.5% of supervisors, 61.2% of employees and 61.1% of controllers considered corruption as a major problem while *in terms of monthly salary* it was corruption was considered as a major problem by 70.7% of those receiving a salary up to €700 and 69.8% of those receiving a salary between €1,501 and €2,000.

It was proved that the *Government and the public sector are more corrupt than the private sector* by 40% of the sample (41.2% of men and 37.6% of women). This is in line with the results reported by Ploumi (2014), still showing some improvement (from 53.26%). Furthermore, it was accepted by 39.2% of residents of Athens, 44.5% of residents of Thessaloniki, and only 36.4% of residents of rural areas. Also, it was accepted by all *educational categories* in the sample (with the exception of those having primary education who disagree by 50%), by 52.4% of employers and 51.7% of pensioners (while 83.9% of civil servants and 62.5% of those engaged in domestic work disagree), by 42.1% of managers and 40% of supervisors, by 55.6% of single-parent families and 50.0% of married couples without children. Moreover, it was accepted by 47.5% of those receiving monthly salary 701-1,000 euro and 45.3% of those receiving monthly salary up to 700 euro (low income). Finally, it was mostly accepted by those having secondary level education, followed by those holding a bachelor's degree, followed by those having primary education, while on the contrary, the lowest acceptance was among those holding a Ph.D., followed by those holding a master's degree.

It was evidenced that 46,8% of respondents think that *personal contacts/relationships are very important to satisfy any request to the public sector*. In fact, this was mostly believed by those receiving a salary up to €700, while those receiving a salary of €1501-2000 disagree, and those receiving a salary of €2001 and above are somewhere in between.

As far as *the contribution of the economic crisis to corruption* is concerned, it was found that 45.7% of the sample believed that the economic crisis has increased the level of corruption in the country's public sector, which is in line with the findings of Avdoulou (2017). Furthermore, 45.9% of the sample believed that during the crisis corruption in the public sector contributed to the increase in the country's public debt, with the highest values among graduates of lower secondary education and those receiving a monthly salary of up to 700 euro. Correspondingly, Ph.D. holders and those receiving a monthly salary of 1501-2000 euro disagreed. These findings are in line with those of Avdoulou (2017) that ends up in similar findings.

As far as *the contribution of digitalization to the fight against corruption* is concerned, 45.2% of the sample believed that public sector digitization limited corruption, with the highest rates among the unmarried and divorced. Furthermore, 53.7% of the sample considered that Integration/interoperability of public sector information systems is a measure that can assist the fight against corruption and 49.3% of the sample believed that digitization increases the effectiveness of public audits and contributes to the fight against corruption.

Regarding *whistleblowing*, the majority of respondents in the sample (61.5%) would not make a *whistleblowing* complaint compared to a percentage (31.0%) who would definitely make a complaint, which is almost half, and the main reasons for their reluctance to whistleblowing were stated as wanting to avoid any targeting of themselves and retaliation and that they consider that the competent authorities are indifferent and that it will not have an effect. The results show a deterioration in the whistleblowing willingness over time as compared to the results reported by Ploumi (2014), that was 67.1%, and could be attributed to the prolonged financial crisis.

The internal consistency/reliability of the questionnaire was checked using the Cronbach's alpha coefficient and is presented in Table 2 below, which shows very high coefficients (>0.70 which is considered the minimum threshold) for all groups of questions except those related to the "Contribution of the economic crisis to corruption".

Table 2. Cronbach's Alpha Internal Consistency Reliability.

Reliability Statistics		
	Cronbach's alpha	No of Questions
Areas of corruption	0.876	16
Types of bribery	0.855	16
Factors busting corruption	0.887	14
Crisis' contibution to corruption	0.337	3
Digitalizartion's contribution to corruption	0.867	7
Measures for fighting corruption	0.927	17

Table 3 below presents the main areas of corruption in Greece, showing that the political parties are in the lead with an AVG. of 4.26, the media with an AVG. of 4.23, and the Trade Union leadership with an AVG. of 3.98, followed by Urban Planning and the Parliamentary/Legislative body with AVG. of 3.94 and 3.74 respectively. The results are in accordance with the relevant findings of Ploumi (2014), that found media in the first place, followed by political parties in the second place. It is noted that the highest scores based on demographic factors are noted as follows: In terms of age: people aged 36-49 mainly believe that corruption mainly exists in local authorities, NGOs, and trade union leaders, while younger people aged 18-35 believe that corruption mainly exists in religious institutions. In terms of marital status: married people with 2 children think that corruption mainly exists in Trade Unions. In terms of educational level: those who have completed secondary education estimate that corruption mainly exists in pharmaceutical and medical services. In terms of occupation: bank employees estimate that corruption mainly

corruption exists among Trade Union leaders and NGOs.

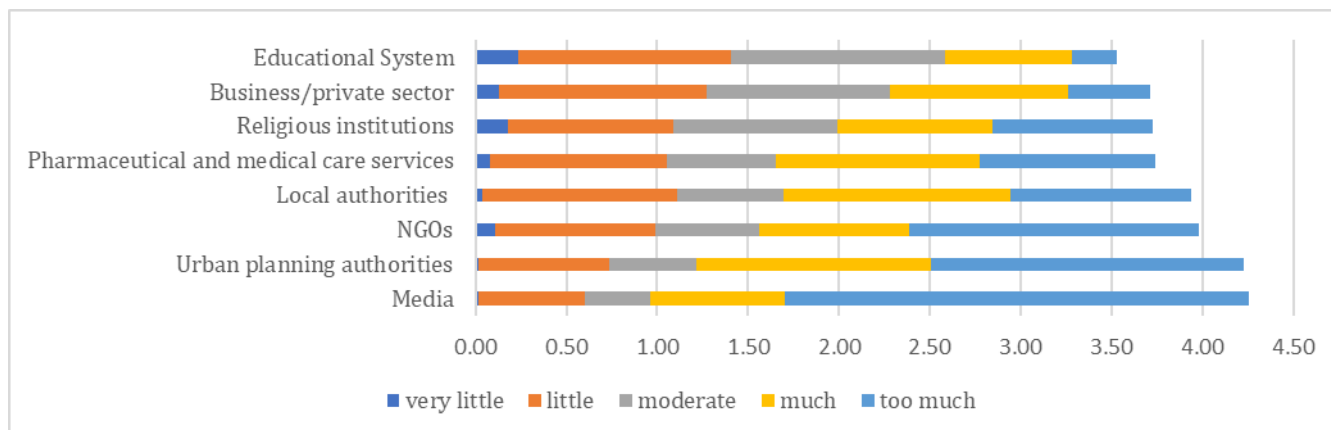


Figure 2. Perceived Areas of corruption in Greece.

Table 4 below shows the prevailing perception on whether various types of bribery are considered corruption, which shows that the top responses are to give money or other consideration "to a tax inspector to settle debts" and "to a planning officer to issue a building permit" (with an AVG. of 4.58). This is followed by bribery for "to obtain a favorable outcome in a case in court" (with an AVG. of 4.53) and by a small margin (AVG. of 4.52) bribery "to pass the examination for a car driving license". Indeed, it is particularly interesting that 28.75% of participants explicitly stated that they would not bribe, while 32% stated that they would bribe for health reasons. It should be noted that perceptions vary by age: Those aged 36-49 and 50-67 primarily rate bribery for a favorable outcome in court as an act of corruption. Those aged 36-49 also rate as an act of corruption the use of an instrument for appointment. Those aged 50-67 also rate bribery for obtaining a driving license and building permit as an act of corruption. Assessments also differ by education level: Among Primary education graduates and Ph.D. holders, bribery "to a tax inspector" is rated with the same weight. The Primary education graduates also consider the use of bribery for "hiring in the public sector" & for "transferring a soldier in another city" to be of high importance, while the Ph.D. holders consider bribery for "issuing a building permit", for "erasing a traffic ticket", for "getting the car to pass the MOT without inspection" & for "favorable outcome of a case in the courts" to be of high importance. Finally, assessments differ by the amount of the monthly salary as well: Those who receive "1,501 to 2,000 euro" evaluate with greater weight the bribery "to a tax inspector", to "an employee of the urban planning department", for "obtaining a driving license" & for the "favorable outcome of a judicial case" while those who receive "up to 700 euro" present a diametrically opposite view. Highly paid employees receiving a salary of "2,001 euro and above" consider the bribery for "erasing a traffic ticket" & "getting the car to pass the MOT without a check" to be of higher importance.

The assessment of the factors that contribute to the creation of the phenomenon of corruption is presented in Table 5 below, which shows that the first place is occupied by "non-attribution of responsibility" (with an AVG. of 4.36), followed by "judicial delays" (with AVG. 4.19), "lack of appropriate control mechanisms" (with AVG. 4.10) and then "lack of transparency" and "complex procedures/bureaucracy" (with AVG. 3.99). The results are in line with those reported by Ploumi (2014) and Avdoulou (2017). The highest scores were as follows: In terms of age categories: for those aged "Over 67" the "lack of personal principles" received the highest score, which is in line with the general finding of Ploumi (2014). In terms of marital status categories, for "Divorced"-ones, the "lack of organization" received the highest score. In terms of region of residence, for residents of Thessaloniki, the lack of "strong democratic institutions" received the highest score. In terms of educational level, for the Primary education graduates, the "lack of appropriate control mechanisms" received the highest score; for "Secondary education"

graduates, the "lack of personal principles", while for "Postgraduates" the "lack of clear regulations" and the "lack of transparency" received the highest score. Finally, in terms of monthly salary, for the low-paid: "lack of stability" and "inadequate education" received the highest score, while for high earners: "the lack of accountability" and "the lack of severity in penalties imposed."

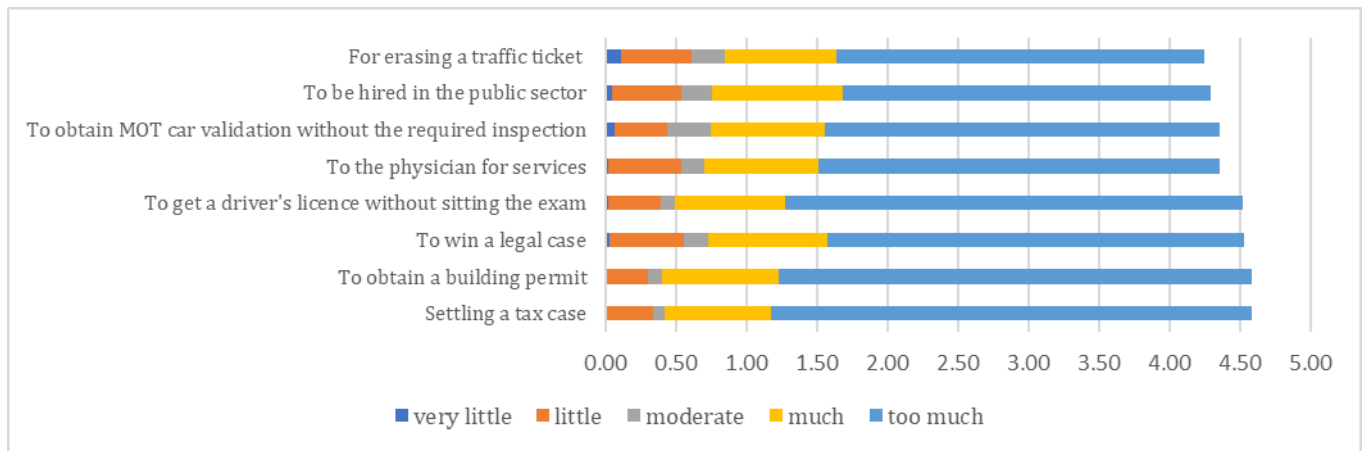


Figure 3. Perceived degree of corruption of various types of bribery.

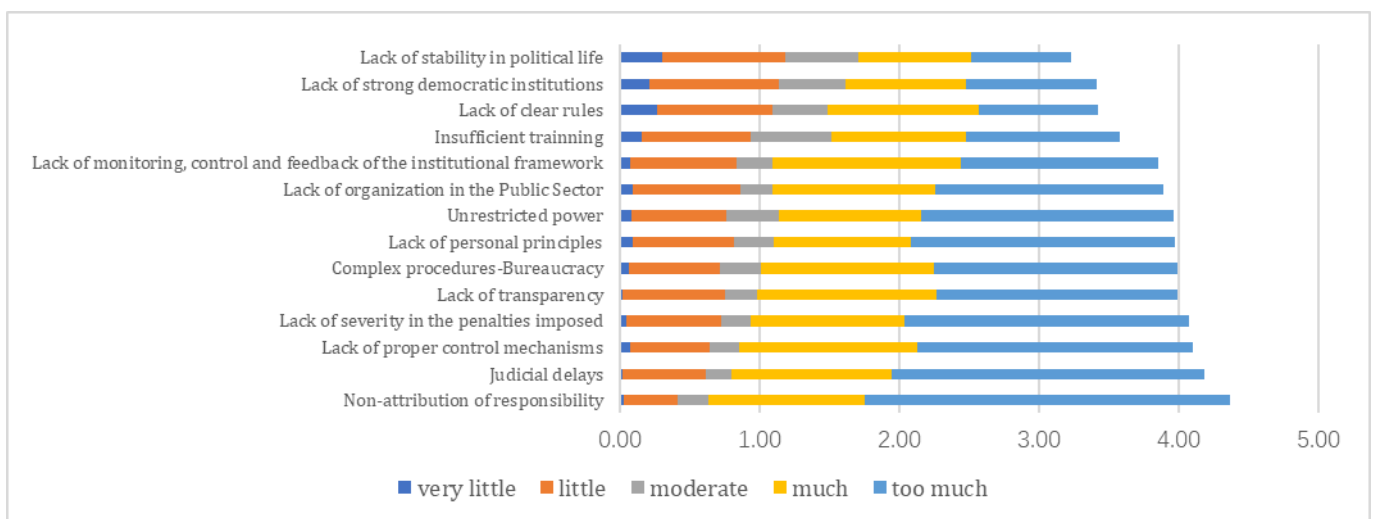


Figure 4. Factors perceived as causes of corruption.

47.6% of the sample believe that it is possible to tackle corruption in the public sector if the right measures are taken. This evidences a clear improvement overtime as compared to the results of Ploumi (2014) that were on the opposite side, that could be attributed to the structural reforms undertaken in the Greek economy especially during the Memorandums. Interestingly, those aged 36-49 agree with this, while those aged 18-35 are pessimistic and completely disagree.

Table 6 below presents the assessment of the factors that contribute to reducing corruption, which shows that the main factor is "reducing bureaucracy" (with an AVG. of 3.86%), followed by "enhancing transparency" (with an AVG. of 3.73), and "simplification, clarity, and standardization of procedures" (with an AVG. of 3.64). Regarding the impact of digitalization on tackling corruption: 49.3% believe that digitization increases the efficiency of controls in the public sector and contributes to the fight against corruption; 53.7% believe that the integration of information systems between public sector services contributes to further reducing corruption; and 45.2% consider that the digitalization of the public sector has contributed positively to the fight against corruption. The highest scores were

among those holding a master’s degree who believe that "the integration of information systems" and "digitization increases the effectiveness of controls in the public sector" contribute to reducing corruption. Based on monthly income, those with an income of 2000 euro and above gave the same answers.

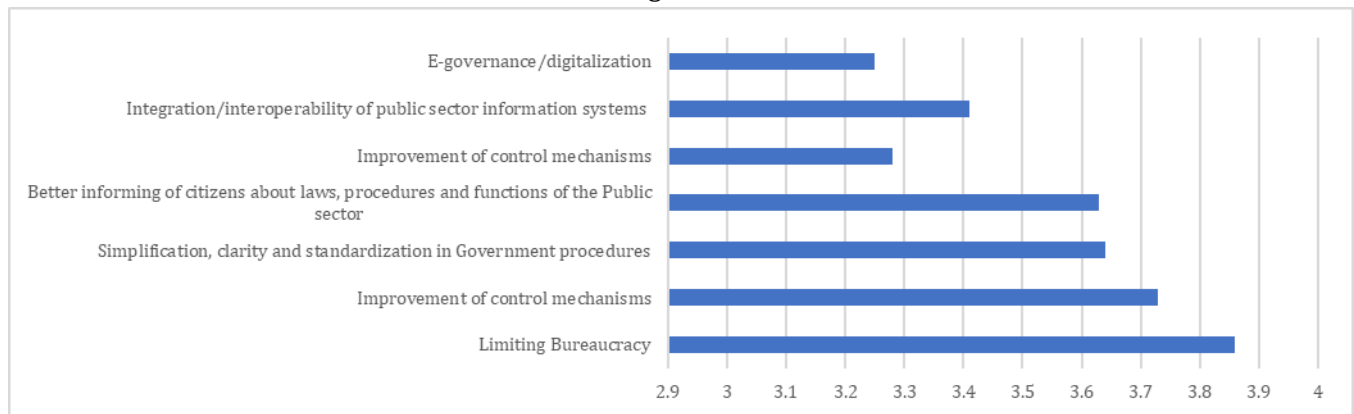


Figure 5. Measures that limit corruption.

In addition, they assessed the effectiveness of measures taken to curb corruption as presented in Table 7 below, according to which 84.10% consider "direct accountability", 81.90% consider "equal application of laws & administration of justice without delay", 76.70% consider "reduction of bureaucracy" and 76.50% consider "improvement of control mechanisms" to be most effective. Kounadeas et al (2022) also indicated the importance of audits in fighting tax evasion/corruption. Ploumi (2014) had reported "equal application of laws & administration of justice without delay", followed by "e-governance/digitalization" and "stricter penalties".

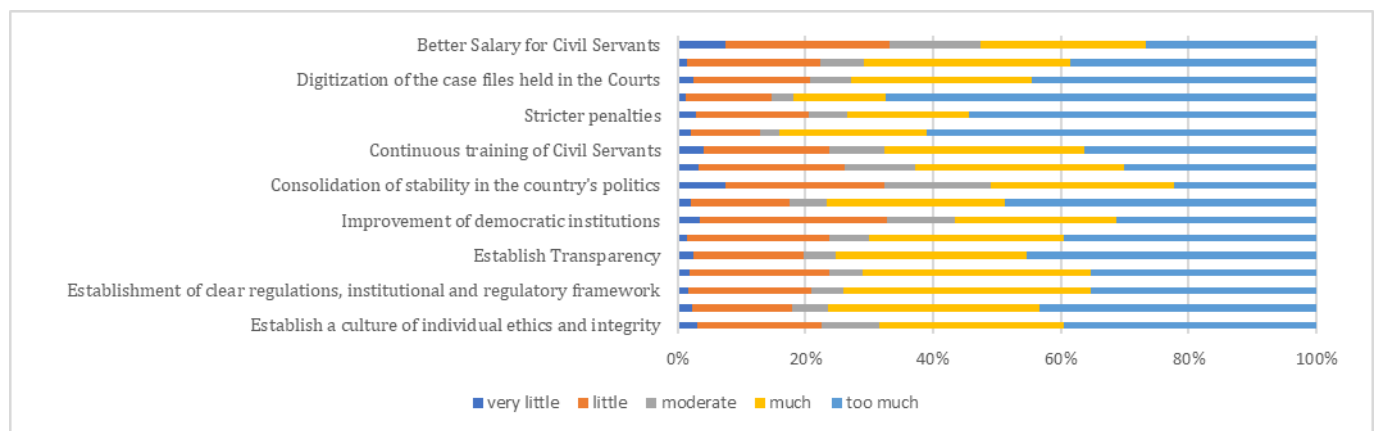


Figure 6. Perceived effectiveness of anti-corruption measures.

Only in the issues depicted in Table 8 below, a statistically significant difference in perceptions between men and women was found. In fact, it is observed that in all variables the mean values of men were higher than those of women in the t-test performed at 5% level of significance (p-value<0.05).

Moreover, from the ANOVA results on corruption areas and corruption fighting measures, it is evident that: In terms of age categories, there is significant difference in the answers received for 5% level of significance (p-value<0.05) with the only exception of the question "Establishing Transparency limits corruption" (p-value=0,482>0,05). In terms of education categories, there is significant difference in the answers received for 5% level of significance (p-value<0.05) with the only exception of questions "Lack of clear rules causes corruption in the public sector" (p-value=0,406>0,05) and "Lack of severity in the penalties-imposed causes corruption in the public sector" (p-value=0,067>0,05). Finally, in terms of marital status categories, occupational categories, regional

categories and monthly income categories, there is significant difference in the answers received for 5% level of significance ($p\text{-value} < 0.05$) for all questions.

Table 3. t-statistic on gender.

	Gender	t-stat	p-value
Public sector digitization limited corruption	Men	3.49	0.001
	Women	3.07	
Integration/interoperability of public sector information systems is a measure that can assist the fight against corruption	Men	3.68	0.000
	Women	3.22	
Digitization increases the effectiveness of public audits and contributes to the fight against corruption	Men	3.49	0.003
	Women	3.12	

3.3. Regional Analysis: Urban vs Rural Areas

Comparing the perceptions of corruption of the residents of the urban areas versus those of residents of rural areas revealed the following were noted:

Regarding the areas of occurrence of Corruption, as depicted in Table 9 below, the residents of urban areas have the highest Corruption in "Political Parties" with AVG. (4.26), followed by "Media" with AVG. (4.23), "Trade Union Leadership" with AVG. (3.98), and so on. While the sectors with the highest Corruption according to the rural residents are again "Political Parties" with AVG. (4.7), in second place are "Tax and Customs Offices" with AVG. (4.6), and so on. This is indicative, in our view, of the power/authority that these institutions hold in small communities.

Table 4. Comparison of perceptions of areas of corruption of residents in urban vs rural areas.

	Urban Areas	Rural Areas
Political Parties	4.26 (1st)	4.7 (1st)
Parliament	3.74	4.5
Judicial sector	3.52	3.9
Army	3.04	3.4
Police	3.36	3.8
Tax offices/Customs	3.71	4.6 (2nd)
Urban planning authorities	3.94	4.5 (3rd)
Local authorities (Municipalities/Regions)	3.53	4.1
Union leaderships	3.98 (3rd)	4.5 (3rd)
Religious institutions	3.36	3.5
NGO	3.73	4.1
Educational System	2.87	3.7
Pharmaceutical and medical care services	3.51	4.5 (3rd)
Utilities (energy, water, sewerage, etc.)	3.31	3.5
Business/private sector	3.13	4.0
Media	4.23 (2nd)	4.7 (1st)

Further, as illustrated in Table 10 below:

In terms of evaluating specific measures based to limit corruption in the public sector, both opinions coincide on "direct accountability". However, in the perception of the residents of urban areas, "direct accountability" is followed by "equal application of laws & administration of justice without delay", "reduction of bureaucracy" and "improvement of control mechanisms", whereas in the perception of residents of rural areas, in similar questions, it is followed by "accelerate justice administration" "e-governance/digitalization" and "stricter penalties".

In terms of willingness to report incidents of corruption, residents of rural areas were more willing to whistle blow (67.35%) than residents of urban areas (57.9%).

Regarding the perception that corruption in the public sector can be addressed by taking appropriate measures, urban residents were more optimistic (47.6%), as compared to the perception of residents of Rural areas (38.83%), whose perceptions are in line with those of Ploumi (2014). Therefore, an improvement in urban areas is clearly evidenced.

Table 5. Corruption measures' effectiveness of residents in Urban vs Rural areas.

	Urban Areas	Rural Areas
Effectiveness of measures for limiting Public Sector corruption	Immediate accountability (1st)	Immediate accountability (1st)
	Equal application of laws to all citizens without exception and administration of justice without time-delay	Accelerate justice administration
Whistleblowing willingness	Reduction of Bureaucracy	E-governance/Digitalization
	Improvement of control mechanisms	Stricter penalties
Belief that corruption in the public sector can be addressed by taking the appropriate measures	Less willing	More willing
	47,6% are optimistic	38,83% are optimistic

4. Solutions and Recommendations

The present study evidenced that corruption is considered a real problem in times of crisis in Greece. The present study extended the assessment of Tatsos (2001) that corruption is influenced by economic, social, and institutional factors, verifying their existence in times of crisis as well. In particular:

Economic Factors: in developed countries, there is no "relationship" between the state and citizens and there is transparency in the financial management of the state. In developing countries where state gigantism, state centralization, and interventionism prevail, the empowerment of the authorized organs of the state is favored and its officials, taking advantage of their monopoly power, are more prone to corruption. In the same way, there is a great deal of political and bureaucratic corruption in countries in times of crisis and in poorer countries.

Social Factors: the extent of corruption is influenced, respectively, by the procedures followed for staffing public services, the prestige that public officials derive from their work, and the level of public sector pay. In particular, the low level of education of staff, the reduced prestige at work and low pay provide a breeding ground for the development of corruption. The present study evidence in terms of participants' educational level and monthly salary confirmed the existence of social factors in terms of crisis as well. Social factors that lead to the growth of corruption include the development of individualism, indifference, and selfish motives, to the detriment of the common and collective good and the common good.

Institutional Factors: the existence of control mechanisms in the public sector (either in the prevention or detection of corruption), was also confirmed by the present study. The factors contributing to their effectiveness are directly related to their political independence, their integrity, and their ability to punish those guilty of acts of corruption. Some of the elements that limit the effectiveness of these mechanisms are the lengthy procedures required to complete corruption checks, bureaucratic obstacles, and, in cases of uncovered corruption, the non-existent or limited number of penalties that are foreseen to be imposed. In addition, the institutional factors that limit the development of corruption include the freedom of the media and the independence of the judiciary, while the 'muzzling' of the media and political interference in the judiciary have a positive effect on it because they limit the publicity of corruption and the conviction of the guilty.

An effective response at the policy level should be based on evidence about the forms it takes in a particular country, the conditions that contribute to its emergence and spread, and knowledge of the institutional or other

incentives that can be used as tools to combat it, as shown by do Nascimento Ferreira Barros et al (2019) studying corruption in Brazil. A standardized set of regulations based on a uniform approach is not enough to combat it, but tools are needed for prevention, detection, suppression, and sanctioning measures. To design a strategy to combat corruption, it is necessary to understand the level of corruption and to identify the areas of high risk and the causes of corruption, as presented in the present study for Greece during this period of crisis.

Collecting reliable data on levels of corruption is a particular challenge since corruption spreads when it remains hidden. Corruption breeds more corruption and encourages a corrosive culture of impunity.

Official cross-border statistical data on corruption offenses that are comparable are extremely rare. A survey conducted by the European Commission in 2015 found that there were many differences in the statistics collected at the EU level between member states in terms of measurement indicators, the definition of offenses, and data collection methodology.

Measures to tackle corruption on the part of a particular country as stated by Nikolopoulou (1988) can be categorized as *Preventive measures* (including strict and consistent adherence to rules and procedures that prevent derogations in favor of certain people; preventing political power from being influenced by political, professional, and economic interest groups; and establishing a clear legal framework to prevent misinterpretations that would allow for the selective provision of services) and *Suppressive measures* (including the operation of truly independent audit authorities on an ongoing basis to monitor the professional conduct of public officials, particularly where there are allegations of corruption; and steps to ensure the adjudication and enforcement of court decisions and to address the phenomenon of postponements leading to statutes of limitations on offenses). As World Bank suggests, the following five key pillars comprise an overall anti-corruption strategy:

- Increasing political accountability and responsibility to citizens.
- Increasing accountability and accountability to the public.
- The creation of a competitive private sector.
- The creation of institutional mounds of power to prevent corruption.
- The administrative improvement and restructuring of the public sector.

The «United Nations Convention against Corruption» is the only legally binding universal anti-corruption instrument. Although participation is mandatory, most United Nations Member States are parties to the Convention. The Convention covers five main areas: preventive measures, criminalization and law enforcement, international cooperation, asset recovery, technical assistance, and information exchange. The Convention covers many different forms of corruption, such as bribery, trading in influence, abuse of functions, and various acts of corruption in the private sector. Furthermore, based on the above convention, Sustainable Development Goal 16 (SDG16) “Peace, Justice and Strong Institutions” offers an international action plan for fighting corruption, which is further analyzed to Target 16.5 “Substantially reduce corruption and bribery in all their forms” and Target 16.6 “Develop effective, accountable and transparent institutions at all levels.”

In every country, the issue of tackling corruption is a matter of general education of citizens in a culture imbued with the values of democracy, transparency, meritocracy, and the primacy of the collective -over the individual-interest. The usual anti-corruption measures fall into the following general categories:

- The implementation of good governance principles (e.g., consultation, e-government, etc.).
- Implementation of internal audit controls.
- Investigation, prosecution, and sanctioning of corruption.
- Disclosure of assets and interests of those in sensitive positions.
- Addressing conflicts of interest in the decision-making process, the allocation of public funds, and public procurement.
- Effective protection of whistleblowers.

- Based on the evidence of the present study, further anti-corruption measures in the categories should be adopted in Greece (in addition to the measures already been implemented) to efficiently tackle the country's corruption problem.

5. Future Research Directions

The present study could be expanded in the future using a bigger sample, from respondents residing in more cities, covering all of Greece and allowing them a wider range of response time. Repeating the survey and collecting questionnaires in a new period and making a comparison would allow more useful conclusions to be drawn, considering the impact of political, social, and economic changes on the sample's responses. Alternatively, it would be interesting to do a comparable study targeting only specific groups, such as Civil Service Auditors, Bank personnel, and so on, residing and operating in different places around the country and comparing the results. Finally, by analogy with the preceding, if a similar survey were conducted in other countries, helpful implications for comparing corruption between nations and/or at the European or regional level may be formed.

6. Conclusion

The empirical study that was carried out thoroughly analyzed the prevailing perceptions of corruption in Greece and reached very interesting conclusions, the most important of which would be appropriate to evaluate in the context of strategic effective planning of policy measures, are as follows:

The study confirmed the serious impact that the crisis had on the spread of corruption. Respondents in the main "productive" age (36-49) believe that if appropriate measures are taken, it is possible to deal with the phenomenon of corruption in the public sector, in contrast with young people aged (18-35) who completely disagree and are completely pessimistic, possibly because they have lived their adult lives mainly in years of crisis (the financial crisis that the country experienced with the Memorandums, followed by the pandemic crisis, the oil crisis and the energy crisis).

The study highlighted key differences between residents of rural and urban areas. Residents of rural areas (as opposed to residents of urban areas) do not consider corruption to be a serious problem and are more willing to report incidents of corruption.

The findings of the study were compared and critically evaluated against those of previous studies for Greece (Avdoulou, 2017; Gofa, 2008; Ploumi, 2014).

Finally, the study indicated that the factors affecting corruption in times of crisis in developed countries tend to assimilate to those affecting developing countries and respectively to the suggested anti-corruption measures to be implemented.

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Conflict of interest

All the authors claim that the manuscript is completely original. The authors also declare no conflict of interest.

Author contributions

Conceptualization: Athanasia Georgiou, Paraskevi Boufounou, Kanellos Toudas; Investigation: Athanasia Georgiou; Methodology: Athanasia Georgiou, Paraskevi Boufounou; Formal analysis: Athanasia Georgiou; Writing – original draft: Athanasia Georgiou, Paraskevi Boufounou; Writing – review & editing: Athanasia Georgiou, Paraskevi Boufounou, Kanellos Toudas.

Appendix

A1. Questionnaire.

DEMOGRAPHIC/PROFESSIONAL DATA

1. Gender : Male, Female
2. Age : 18-35; 36-49; 50-67; 67+
3. Marital Status : Single; Widower; Divorced; Single Family; Married-no children; Married with 1 or 2 Children; Married with more than 2 children.
4. Residence : Athens; Thessaloniki; Patras; Other
5. Education : PhD; Master; University; Secondary Education; Primary Education
6. Occupation : Employer; Private sector employee; Public Sector Employee; Banking sector; Pensioner; Student; Domestic work/Housewife; Other
7. Profession : Employee; Supervisor; Manager; Inspector; Other
8. Monthly Salary : <700; 701-1000; 1001-1500; 1501-2000; >2001

PART A - MEASURING PERCEPTIONS OF CORRUPTION

1. Corruption is an important problem in Greece
2. Government and the public sector are more corrupt than the private sector
3. Areas of Corruption in Greece: political parties; Parliament/legislative body; judicial sector; army; police; tax offices/customs; urban planning authorities; local authorities; trade union leaderships; religious institutions; NGOs; educational system; pharmaceutical and medical care services; utilities (energy, water, sewage, etc.); business/private sector; media
4. Personal contacts/relationships are very important to satisfy any request in the public sector
5. Perceived degree of corruption of the following types of bribery for: settling a tax case; obtaining a building permit; getting a driver's license without sitting the exam; erasing a traffic ticket; obtaining MOT car validation without the required inspection; being hired in the public sector; physician services; getting a relative/acquaintance transferred in the army; winning a legal case
6. Bribery is required in order to: settle a tax case; obtain a building permit; be hospitalized at a public hospital; be hired in the public or private sector; obtain a certificate from the municipality; win a legal case; erase a traffic ticket
7. Main reasons for committing bribery
8. "Rate" the factors which are perceived as causes of corruption: lack of personal principles; lack of proper control mechanisms; lack of clear rules; lack of transparency; inefficient public sector structure; lack of strong democratic institutions; complex procedures-bureaucracy; lack of political stability; unrestricted power; lack of proper training; non-attribution of responsibility; lack of severity in the penalties imposed; judicial delays; lack of monitoring, control and feedback of the institutional framework

PART B - CORRUPTION EFFECTS ON PUBLIC DEBT

1. The economic crisis increased the level of corruption in the Greek public sector
2. Corruption in the public sector contributed to the increase in public debt

PART C - MEASURES THAT LIMIT CORRUPTION

1. Taking measures to curb corruption limit corruption on the public sector
2. Public sector digitalization has limited corruption
3. Integration/interoperability of public sector information systems is a measure that can assist the fight against corruption
4. Digitization increases the efficiency of controls in the public sector and contributes to the fight against corruption
5. Digitization increases the effectiveness of public audits and contributes to the fight against corruption by simplifying and standardizing government procedures; limiting bureaucracy; enhancing transparency in public spending and revenue management; better informing of citizens about laws, procedures and functions of the public sector
6. "Rate" the following measures that limit corruption on the basis of effectiveness: establishment of a culture personal ethics and integrity; improvement of control mechanisms; establishment of clear regulations, institution and regulatory framework; -establishment of monitoring, control and feedback of the institutional framework establishment of transparency; structural changes on the public sector; organizational changes on the public sector improvement of democratic institutions; limiting bureaucracy; establishment of stability in the country's political life developing new skills for staff employed in the public sector; continuous training of civil servants; direct accountability stricter penalties; equal application of laws & administration of justice without delay; digitalization of the case files held in the Courts; better staff selection policies; better salary for civil servants
7. Willingness to report incidents of corruption
8. Reasons for not reporting an incident of corruption.

Likert Climax: 1 Very little; 2 Little; 3 Moderate; 4 Much; 5 Very much

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