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## Article

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## Article

# It Is Time for Anti-Bribery: Financial Institutions Set the New Strategic “Roadmap” to Mitigate Illicit Practices and Corruption in the Market

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**Abstract:** The financial sector is characterized by complexity due to the management of a large volume of transactions, which can lead to the difficulty of considering, identifying, and monitoring them. The lack of mechanisms in monitoring and control transactions can contribute to the development of illegal practices within a company, such as fraud, corruption, bribery, and money laundering. These phenomena can affect financial institutions negatively. Therefore, the development of an appropriate corporate governance system can ensure to members of the board and executives in a company that any illegal practice can be detected. This study aims to highlight the factors that contribute to the development of illegal practices within European financial institutions. This can help executives to plan and mitigate the illicit practices that may emerge. For this purpose, a binary logit regression analysis on panel data from 2018 to 2020 was applied to 336 European financial companies. The findings of this research emphasize the crucial role of corporate governance in the prevention of the development of illicit issues within European financial institutions, while human resources can be characterized as a pathway to corruption. Both factors, corporate governance and human resources, are main pillars of environmental, social, and corporate governance (ESG), which indicates the need of the financial sector in Europe for the elaboration of anti-corruption strategies. Thus, companies within the sector can improve their ESG score.

**Keywords:** anti-corruption strategy; financial institutions; management; governance; human resource



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## 1. Introduction

Corruption is a phenomenon that concerns states, public mechanisms, and private companies and can be defined as dishonest behavior by those who hold a position of power, such as managers or government officials (Chan et al. 2019; Hauk et al. 2022). Corruption can include giving or accepting bribes, double-dealing, under-the-table transactions, diverting funds, or laundering money. Financial institutions are more vulnerable to corruption due to the complexity of their business and the offered products (Uberti 2021).

Bribery, fraud, and blackmail are some of the most well-known forms of corruption in the finance sector. Moreover, corruption can be encountered in developing or developed countries, but the rate can differ (less or higher). Scholars have affiliated corruption with cancer, as corruption enters all aspects of society, such as political, economic, and cultural-social, destroying all its healthy structures. Based on that, corruption is studied from economic perspectives and political and sociological science. In the international literature, corruption can be categorized by culprit or method. The usual categorization of fraud at the business level is internal and external. This classification is based on the origin of the person who committed this harmful practice, namely whether the person comes from the

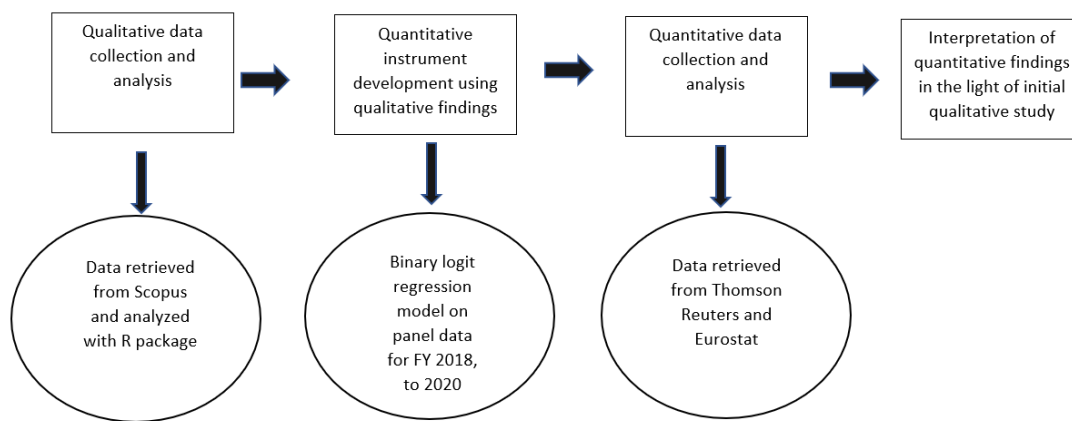
internal or external environment of the business. Examples of corruption caused by people from the external environment of businesses are those beget by suppliers, customers, or other external partners.

On the other hand, when an employee steals a company's information or a manager alters its data, corruption comes from the business's internal environment. Additionally, corruption caused by the internal environment can be considered as work fraud and ill-treatment, as the person who commits it must be an employee of the company while at the same time using his capacity in the wrong way to achieve some benefit for himself. In exceptional cases, external and internal fraud may occur, as a company's employee may cooperate with other companies to his advantage.

In Europe, the fight against fraud and corruption, as well as the protection of financial interests, was formalized by creating the Anti-Fraud Coordination Unit (UCLAF) in 1988. Additionally, in 1995, the Convention on the Protection of Financial Interests of the European Communities was another action to protect the financial sector from fraud, while efforts were further strengthened with the establishment of the European Anti-Fraud Office (OLAF) in 1999. The above actions prove Europe's willingness and effort to protect its financial interests. In essence, the above measures seek to achieve the following objectives: (i) to guarantee the protection of financial interests through the establishment of criminal law and administrative investigations, (ii) to improve OLAF's governance and strengthen procedural safeguards in investigations, (iii) to establish and support the European Public Prosecutor's Office (EPPO), and (iv) to reform Eurojust and to improve the protection of the Union's financial interests. However, the pandemic of COVID-19 has favored the manifestation of corruption and fraud in the European financial sector. The restrictions against the pandemic, such as the lockdowns, have increased online transactions, limiting face-to-face interactions and identity verification. Instead, the pandemic has changed the market typologies of fraud and corruption, the most common being CEO fraud, investment scams, invoice fraud, and "phishing."

The aim of this paper is twofold: (i) to investigate the key trends and characteristics of illicit corruption in the European financial sector, and (iii) to highlight the factors that are integrated or not in the anti-corruption strategies of financial institutions as tools to mitigate illegal movements of money like bribery and money laundering. To approach the research objective, a mixed-method research design, which includes both qualitative and quantitative analysis, was applied (Figure 1). Qualitative analysis was based on bibliometric analysis, contributed to the presentation of the research trends in the studied field, and gave directions to identify the factors that drive businesses in the financial sector to illegal practices. Data for the bibliometric analysis were retrieved from the Scopus database and analyzed using the R package. The second part of the research methodology referred to developing a binary logit regression model on panel data from 2018 to 2020. The authors selected a set of variables (seventeen exogenous variables) based on the first part of the research design, which was the bibliometric analysis. Findings from regression analysis indicate the factors included or not as anti-corruption tools in European financial institutions' campaigns to mitigate corruption in the market.

The paper is broken into the following sections. Section 2 presents the rigorous literature review search through the bibliometric analysis using the R package. Section 3 illustrates the materials and methods used. Section 4 presents the results. Section 5 discusses the findings, indicates theoretical and practical contributions, and proposes future research recommendations. Finally, Section 6 concludes the paper.

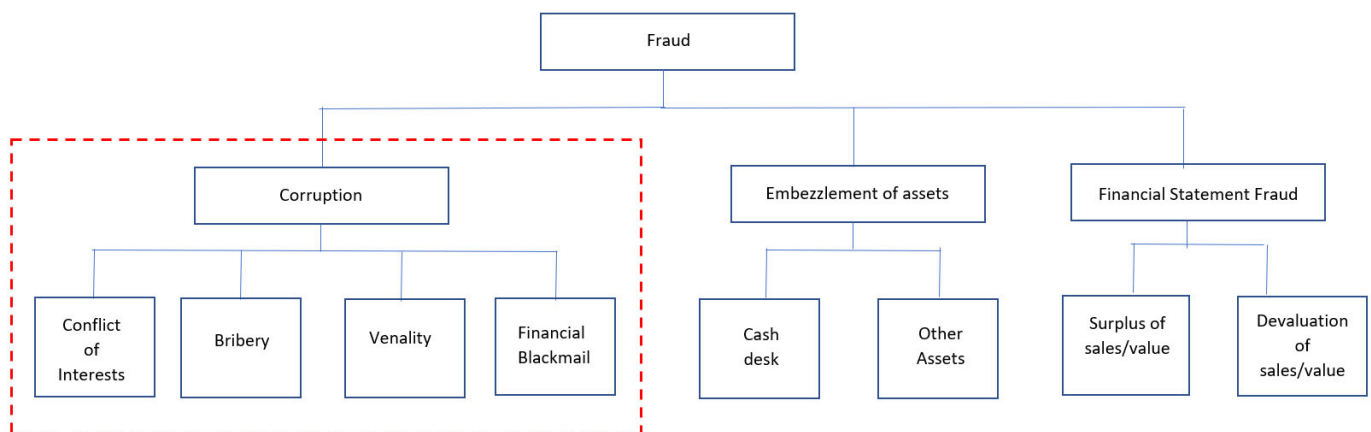


**Figure 1.** Mixed-methods research design. Source: Own elaboration.

## 2. Literature Review

### The Main Channels and Key Trends of Corruption in the Finance Sector

Corruption can be defined as the abuse of power (public or private office) to gain personal benefit and is a subcategory of fraud, which becomes visible in many ways and forms (Figure 2) (Uberti 2021). On a small and large scale, conflict of interest, bribery, venality, and financial blackmail are just some of the forms that the phenomenon of corruption takes (Table 1) (Abbink and Wu 2017).



**Figure 2.** Corruption as a form of fraud. Source: Scopus/Biblioshiny.

**Table 1.** Distinguishing corruption into forms.

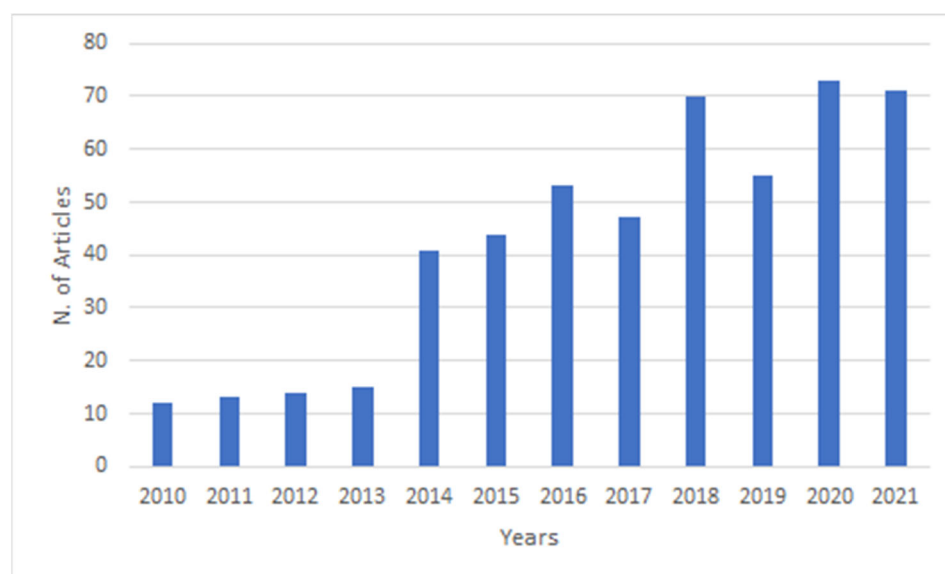
Forms of Corruption	Definition
Conflict of interests	A situation in which an employee has a private interest that could unduly affect the performance of his or her duties and responsibilities (Lino et al. 2021).
Bribery	A situation in which a person intentionally offers, promises, or gives an unjustified advantage to an official or executive responsible for making decisions, for him to act or to avoid acting, to the performance of his duties (Binhadab et al. 2021; Jain 2020; Soans and Abe 2016).
Venality	A practice in which bids are manipulated in a tender. For example, potential bidders agree to offer higher prices or degrade the quality of the products/services offered provide tenders among themselves (Soans and Abe 2016).
Financial blackmail	A practice that refers to the illegal use of a person's position to extort money in exchange for an unfair financial advantage (Mangoma and Wilson-Prangley 2019; Silke 1998).

Source: Own elaboration.

Usually, corruption is a significant issue in public-private relations, especially in countries where states are heavily involved in the economy. However, the phenomenon of corruption is very intense in private companies. Financial corruption can be ranked first among the main sources of corruption in the economic sectors. This is based on the complexity of financial institutions' procedures and the products they manage.

A bibliometric approach was applied to analyze the data for a comprehensive overview of the trend, thematic focus, and scientific production in the field of corruption in the finance sector. Bibliometric analysis is a popular and rigorous method used for statistical evaluation to explore and analyze large volumes of scientific data (Ellegaard and Wallin 2015; Lalmi et al. 2022; Tabak et al. 2021). The aim of the bibliometric analysis is fourfold: (i) to detect state-of-the-art research for a particular field, (ii) to highlight the most cited articles and examine their impact on subsequent research by others, (iii) to show what journals, organizations, and even countries have a high impact in different fields of research, and (iv) to make comparisons (Rojas-Lamorenna et al. 2022; Tabak et al. 2021). The most commonly used bibliometric methods are citation or co-citation and content analysis (Zhang et al. 2021). Regardless of the method used by the researcher, the bibliometric analysis presents a comprehensive map of the structure of knowledge, its evaluation, and measurement that focuses on the bibliographic analysis of scientific publications collected in a database (Gou et al. 2022). This article selects the Scopus database as the primary data source of the current research. Scopus is Elsevier's bibliography and citation search services provided through the SciVerse platform. It is the most extensive database globally of references and summaries from reputable international literature with intelligent tools that help researchers retrieve, analyze, and visualize parts of the information they are interested in. It includes over 20,500 titles from 5000 publishers worldwide, 49 million subscriptions (78% with abstracts), over 5.3 million conference papers, and 100% Medline coverage. The data collection was carried out in February 2022 with the following entered search terms: ["illicitly" AND ("corruption" OR "anti-corruption") AND "financial sector"]. The search language is English. The Scopus bibliographic citation database includes various documents, but only original articles were considered in the present analysis. A total of 687 documents were finally selected for analysis. The records for each publication retrieved during the search were converted as a Scopus BibTex file, imported into Biblioshiny, and analyzed by the R package.

The evolution of articles published on illicit practices and corruption in the finance sector during 2010–2021 is presented in Figure 3. The number of publications started to increase in 2013 (15 documents).



**Figure 3.** Evolution of the number of articles (2010–2021). Source: Scopus/Biblioshiny.

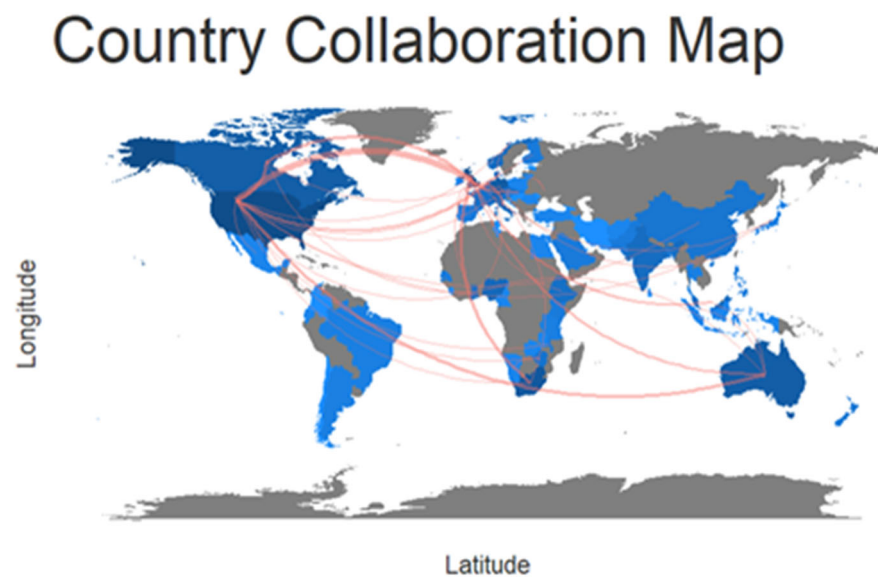
However, the graph shows that publications considerably increased with situations over the years, while 2020 can be characterized as the peak spotted year of publications on the issue. The journal with the most published articles about corruption and illicit practices in the finance sector over the period 2010–2021 is presented in Table 2. “World Development” is the journal that has already published the highest number of articles on the field of illicit practices and corruption in the finance sector (321), “American Economic Review” is the second leading journal with 210 articles found on the study field of the current paper, and the “Journal of Public Economics” (156) is the third journal among those with the most publications on financial illicit practices. Additionally, the journals included in the list with the most relevant resources in the field of financial illicit practices are indexed by the latest Academic Journal Guide 2021.

**Table 2.** The most relevant resources in the field of illicit practices and corruption in the financial sector.

Sources	Number of Articles
World Development (3 ***—Abs List 2021)	321
American Economic Review (4 ****—Abs List 2021)	210
Journal of Public Economics (3 ***—Abs List 2021)	156
Third World Quarterly (2**—Abs List 2021)	115
Quarterly Journal of Economics (4 ****—Abs List 2021)	109
Journal of Political Economy (4 ****—Abs List 2021)	97
Journal of Business Ethics (3 ***—Abs List 2021)	91
Journal of Economic Perspectives (4 ****—Abs List 2021)	91
Journal of Development Studies (3 ***—Abs List 2021)	89
Review of African Political Economy (2 **—Abs List 2021)	84
Review of International Political Economy (3 ***—Abs List 2021)	84
Antipode (3 ***—Abs List 2021)	75
Development and Change (3 ***—Abs List 2021)	75
Resources Policy (2 **—Abs List 2021)	75
Economic Journal (4 ****—Abs List 2021)	65
Journal of International Economics (4 ****—Abs List 2021)	65
Public Choice (3 ***—Abs List 2021)	60
Economy and Society (3 ***—Abs List 2021)	58
Journal of Comparative Economics (3 ***—Abs List 2021)	56
Journal of African Economies (2 **—Abs List 2021)	54
International Journal of Disclosure and Governance (2 **—Abs List 2021)	53
Journal of International Development (2 **—Abs List 2021)	53
Journal Of International Money and Finance (3 ***—Abs List 2021)	53

\* The symbol of \* refers to the journals that are indexed by ABS list. The higher the number of \* the higher impact has the journal in the field. Source: Scopus/Biblioshiny.

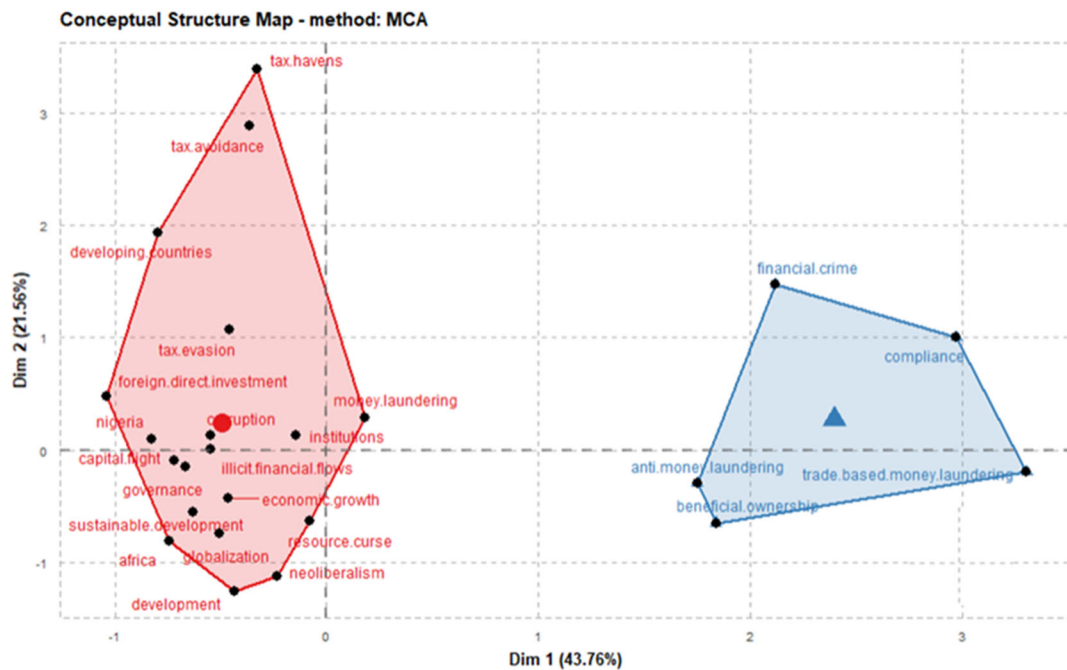
The map presented in Figure 4 identifies countries’ collaboration with the leading article producers. Two areas hold a connection line indicating the status of collaboration among them. That can be understood by the scale of cooperation represented through the thickness of the red line. The United States of America and North-West Europe have deepened cooperation and exchange among scholars ([Aria and Cuccurullo 2017](#)). Moreover, the connection between Northern-Western European countries and South Africa is worthwhile to refer to, as it may have highlighted a new channel of corruption in the financial sector ([Hope 2020](#)).



**Figure 4.** Country collaboration map. Source: Scopus/Biblioshiny.

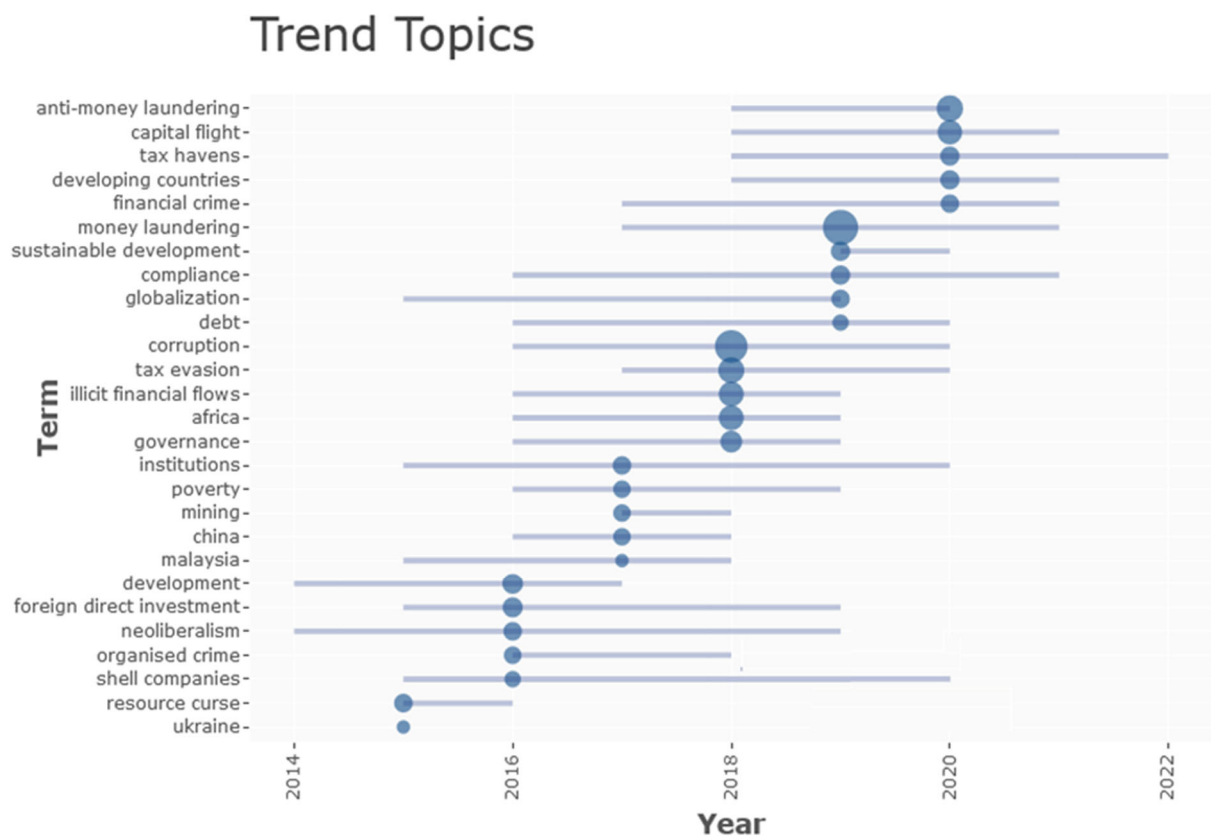
This strong connection between South Africa and Northern-Western European countries' illicit practices in the financial sector was further analyzed. Figure 5 visualizes the temporal structure in a two-dimensional plot of the research concentration from 2010 to 2021 based on multiple correspondence analyses (MCAs) of author keywords (Aria and Cuccurullo 2017). The graph indicates that the keywords used in scientific outputs are organized into two primary clusters, which concentrate on related issues regarding illicit practices and corruption in the finance sector. The two clusters demonstrate the diversity and intellectual thrust of the work undertaken in each cluster. The significant difference between them is that the first (color: red) highlights the issue of corruption and the second (color: blue) highlights the need for anti-corruption. The first cluster (color: red) contains a total of 19 keywords associated with articles that emphasize the different forms of corruption in financial institutions, such as illicit financial flows, capital flight, and money laundering, which are related to the strategy of the financial institutions to invest in “tax haven” countries. This decision-making allows them to achieve tax avoidance, tax evasion, and increase their cash flow. Developing countries are selected mainly by these financial institutions. Nigeria is the top of the four emitters of illegal flows in Africa, along with South Africa, the Democratic Republic of Congo (DRC), and Ethiopia (Gillies 2020; Ganda 2020).

Moreover, this cluster indicates that related research keywords of illicit practices and corruption are related to sustainability and economic growth. That is based on the issue that corruption, money laundering, and other illegal financial actions are barriers for governments to deliver sustainable economic growth (Rose 2020). Specifically, African economies present a severe development problem because of their role as “tax havens,” which prevents them from achieving better economic performance and sustainability (Salahuddin et al. 2020). The second cluster (color: blue) is encompassed by five keywords associated with articles that address the issues of anti-corruption and compliance. Moreover, beneficial ownership is vital in this cluster, as it is the central pillar of anti-money laundering. Beneficial ownership transparency is essential in preventing, detecting, prosecuting, and sanctioning financial crimes. Even though beneficial ownership transparency is increasingly recognized, implementation remains uneven, and more clarity and granularity are necessary (Vian 2020).



**Figure 5.** Bibliometric analysis of 687 data records—factorial analysis. Source: Scopus/Biblioshiny.

Furthermore, an analysis of the trending topic was conducted based on the author's keywords from the dataset. While performing the analysis, the following parameters were configured; timespan was set from 2010 to 2021, word minimum frequency was set to 5, the number of words per year was set to 5, and word label size was also set to 5. Article keywords, which authors define, are usually connected to such publication content and are sufficient to derive topical aspects of a field (Aria and Cuccurullo 2017). This analysis gives further insight into the trending topics concerning keyword occurrences in financial illicit practices and corruption literature over the years. Figure 6 presents the authors' keywords in the hierarchical arrangement of topics on illicit practices and corruption in the financial sector discussed by scholars annually. These topics could relate to illicit practices in financial institutions in many ways. For instance, in 2019, money laundering was the most discussed topic in the theme of corruption in financial institutions. However, one year later, in 2020, anti-money laundering was the most discussed issue in the same field, revealing the market's transition from illicit practices to sustainability (Ganda 2020).



**Figure 6.** Trending topics between 2014–2022. Source: Scopus/Biblioshiny.

### 3. Materials and Methods

#### 3.1. Fitting Binary Logit Regression Model on Panel Data

In the present study, binary logit regression analysis was used to analyze the factors contributing to the practices of European financial companies. A binary response model is a regression model in which the dependent variable  $Y$  assumes a binary random variable that takes on only the values zero [0] and one [1]. In the current study, 1 means “Yes” and indicates the likelihood of financial companies in Europe falling into illegal practices, while 0 means “No” and refers to the likelihood of European financial companies not falling into illegal practices. The model can be specified in the logistic functional form by first applying a log-odds transformation of  $y$  as a linear function of  $x_i$ , i.e.,

$$\text{Log} = y/(1 - y)x\beta \quad (1)$$

Seemingly, the model can be re-specified in the logistic functional form as:

$$E[P] = \frac{\exp(x\beta)}{1 + \exp(x\beta)} \quad (2)$$

where  $P$  is the probability that financial companies indulge in illicit practices given a vector of explanatory variables  $X (x_1, x_2, x_3, \dots, x_n)$ . Moreover,  $\beta$  is a vector of the coefficients ( $\beta_1, \beta_2, \beta_3, \dots, \beta_n$ ), while  $\exp$  represents the natural logarithm.

Upon dividing Equation (2) by  $P$ , subtracting 1, and taking the natural logarithm of both sides, then the equation is re-specified as:

$$\ln (P/1 - P) = a + X\beta + u, \quad (3)$$

Hence, for verifying illicit practice, the functional model is re-specified as follows:

$$\text{Logit}(p) = \ln(P/1 - P) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n + \varepsilon \quad (4)$$

where  $X_1$  to  $X_n$  are presented below; the series of independent variables are:

Constant Variable	$Y_p$	Bribery Corruption and Fraud Controversies
Dependent variables	ESGSC	ESG Score
	SOCSC	Social Pillar Score
	RESOURC	Resource Use Score
	EMISSC	Emissions Score
	ENINSC	Environmental Innovation Score
	WORKSC	Workforce Score
	HUMRISC	Human Rights Score
	MANAGESC	Management Score
	ENERGPROD	Energy productivity (euro per kilogram of oil equivalent)
	RENEWA	Share of renewable energy in gross final energy consumption by sector (%)
	RDPERSONSC	R&D personnel by sector (%)
	VHCN	High-speed internet coverage by type of area (%)
	GINI	Income distribution (ratio)
	HUMRES	Human resources in science and technology (%)
	COMPUSK	Individuals' level of computer skills (% of individuals)
	ITSPECWORK	Enterprises that employ ICT specialists (enterprise size and Nace Rev. 2)
	ICTCOMPS	Employed ICT specialists—total (% of total employment)
	TRAIPERICT	Enterprises that provided training to develop/upgrade the ICT skills of their personnel (enterprise size)
	ICTEDU	Persons with ICT education by labor status
	ICTTOTVA	Percentage of the ICT sector in GDP
	ICTSPEC	Percentage of the ICT personnel in total employment
	INTERIND	E-banking and e-commerce
	CORRIND	Corruption Perceptions Index
	TOTASS	Total Assets
	TOTDE	Total Liabilities
	TOTPROF	Retained Earnings
	EBIT	Earnings BEF Interest and Taxes
	NESAS	Net Sales of revenue
	TOTSHAST	Market capitalization

### 3.2. Data

The data for the mitigation of the financial illicit practices and corruption model were extracted from three sources: (i) the financial database Datastream powered by Eikon, (ii) the financial database of Eikon powered by Thomson Reuters, and (iii) Eurostat. Eikon is one of the most extensive financial market databases globally, which provides access to information relevant to macro analysis, asset allocation strategy, and sector research. Eikon is powered by Datastream, one of the most comprehensive economic databases, which combines company and cross-asset market data. One of Datastream's strengths is providing access to historical data, making it a useful resource if carrying out economic regressions or needing historical data on financial instruments. Datastream's powerful graphical representations and data processing capabilities through Microsoft Office applications complement Thomson Reuters Eikon. Together offers a harmonized application environment for full real-time international financial market coverage and analysis of global market developments, identifying investment and trading opportunities in the appropriate countries, industries, and investment tools.

### 3.3. Variables

The description of the dependent variable and the seventeen exogenous variables that were integrated for investigation by the three regression models are illustrated in Table 3. In the following paragraphs are provided the model and the estimation results.

Dependent variable:

Bribery Corruption and Fraud Controversies. This index describes if a company is under the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports, or any tax fraud.

**Table 3.** Variables of the study.

Type	Variables	Description	Measurement Level	Source
Dependent variable	BRIBCORR	This index describes if a company is under the spotlight of the media because of a controversy linked to bribery, corruption, political contributions, improper lobbying, money laundering, parallel imports, or any tax fraud	Binary	Thomson Reuters (Datastream)
	ESGSC	ESG Score is an overall company score based on self-reported information in the environmental, social, and corporate governance pillars (Thomson Reuters Eikon n.d.). ESG factors have been selected as the most crucial factors contributing to mitigating market corruption. The focus on environmental, social, and governance (ESG) issues continues to grow rapidly. One of the main drivers fueling this ongoing attention to ESG monitoring and reporting is the fact that investors desire and are increasingly seeking to make socially responsible investments that will be characterized by transparency too	Continuous	Thomson Reuters (Refinitiv Eikon)
Independent variables	SOCSC	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers, and society, through its use of best management practices. It reflects the company's reputation and the health of its operating license, which are key factors in determining its ability to generate long-term shareholder value (Thomson Reuters Eikon n.d.). The reason for the investigation of the relationship between corruption and social pillar score is similar to the investigation of ESG score and corruption.	Continuous	Thomson Reuters (Refinitiv Eikon)
	RESOURC	It reflects a company's performance and capacity to reduce the use of materials, energy, or water and to find more eco-efficient solutions by improving supply chain management.	Continuous	Thomson Reuters (Refinitiv Eikon)
	EMISSC	The Emissions Score measures a company's commitment to and effectiveness in reducing environmental emissions in the production and operational processes (Thomson Reuters Eikon n.d.). The relationship between emissions and corruption is complicated, and its investigation is more nuanced than one may think.	Continuous	Thomson Reuters (Refinitiv Eikon)
	ENINSC	Environmental Innovation Score reflects a company's capacity to reduce its customers' environmental costs and burdens, thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.	Continuous	Thomson Reuters (Refinitiv Eikon)
	WORKSC	Workforce Score measures a company's effectiveness towards job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.	Continuous	Thomson Reuters (Refinitiv Eikon)
	HUMRISC	Human Rights Score measures a company's effectiveness in respecting the fundamental human rights conventions.	Continuous	Thomson Reuters (Refinitiv Eikon)

Table 3. Cont.

Type	Variables	Description	Measurement Level	Source
Independent variables	MANAGESC	This score measures a company's commitment and effectiveness towards following best practice corporate governance principles (Thomson Reuters Eikon n.d.). The principles of good corporate governance, such as transparency, can contribute not only to the improvement of the operational efficiency of a company but can also decrease the level of corruption through the enforcement of constraints that mitigate both the corrupt officials and the corruptors from the private sector.	Continuous	Thomson Reuters (Refinitiv Eikon)
	ENERGPROD	The indicator measures the economic output produced per unit of gross available energy. The gross available energy represents the quantity of energy products necessary to satisfy all demands of entities in the geographical area under consideration. The economic output is either given in the unit of Euros in chain-linked volumes to the reference year 2010 at 2010 exchange rates or in the unit PPS (Purchasing Power Standard). The former is used to observe the evolution over time for a specific region, while the latter allows comparing Member States in a given year.	Continuous	Eurostat
	RENEWA	According to the Renewable Energy Directive, the indicator measures the share of renewable energy consumption in gross final energy consumption. The gross final energy consumption is the energy used by end-consumers (final energy consumption) plus grid losses and self-consumption of power plants. This indicator is calculated based on Directive 2009/28/EC on the promotion of the use of energy from renewable sources. The calculation is based on data collected in the framework of Regulation (EC) No 1099/2008 on energy statistics and complemented by specific supplementary data transmitted by national administrations to Eurostat. In some countries, the statistical systems are not yet fully developed to meet all requirements of Directive 2009/28/EC, with respect to ambient heat captured from the environment by heat pumps.	Continuous	Eurostat
	RDPEROSC	R&D and innovation are major drivers of competitiveness and employment in a knowledge-based economy. Greater investment in R&D provides new jobs in business and academia, increasing demand for scientists and researchers in the labor market.	Continuous	Eurostat
	VHCN	This indicator measures the share of households with fixed, very high-capacity network (VHCN) connections. This type of network is referred to as either an electronic communications network that consists entirely of optical fiber elements at least up to the distribution point at the serving location or an electronic communications network capable of delivering, under usual peak-time conditions, similar network performance in terms of available downlink and uplink bandwidth, resilience, error-related parameters, and latency and its variation. The Internet can be characterized as a useful technology in controlling corruption. So, examining the relationship between high-speed internet and corruption is important.	Continuous	Eurostat
	GINI	In economics, the Gini coefficient, also known as the Gini index or Gini ratio, is a measure of statistical dispersion intended to represent income or wealth inequality within a nation or a social group.	Continuous	Eurostat

Table 3. Cont.

Type	Variables	Description	Measurement Level	Source
Independent variables	HUMRES	Human resources in science and technology, abbreviated as HRST, refers to those persons who fulfill one or the following conditions: completed education at the third level OR not formally qualified at the Third Level but is employed in an S&T occupation where the above qualifications are normally required.	Continuous	Eurostat
	COMPUSK	The indicator was developed in cooperation with users in the European Commission based on the Digital Competence Framework. It describes general digital literacy and skills in using the internet over time. Aspects of accuracy, reliability, timeliness, and comparability for the general population are satisfactory.	Continuous	Eurostat
	ITSPECWORK	Expresses the number of organizations that recruit ICT specialists.	Continuous	Eurostat
	ICTCOMPS	ICT specialists are defined as persons who can develop, operate, and maintain ICT systems, and for whom ICTs constitute the main part of their job. This index measures the number of ICT specialists.	Continuous	Eurostat
	TRAIPERICT	Measures the number of enterprises that provide their employee's training to develop or upgrade their ICT skills (Eurostat 2021). ICT has emerged as a vital tool in fighting corruption. Specifically, ICT has added a new dimension to the efforts of businesses to mitigate corruption, as information can be retrieved in a matter of minutes. So, the investigation of the relationship between ICT and corruption is vital.	Continuous	Eurostat
	ICTEDU	This indicator describes those with ICT education in the labor force by their employment status (worker, employee, self-employed, director, or contractor) (Eurostat 2021). Corruption within a company related to Human Resources may occur at different employment statuses, so investigating the relationship between persons with ICT education (classified by their labor status) and corruption issues is crucial. Only employees and directors were considered in the current study regarding employment status.	Continuous	Eurostat
	ICTTOTVA	At the heart of economic changes for more than two decades, the ICT sector acts as a key determinant of the competitive power in the knowledge economy, attracting investments and creating innovation. By generating new technologies applicable to a wide range of other sectors, the Information and Communication Technologies (ICT) sector plays a strategic role in promoting growth, innovation, and competitiveness across European economies. Indeed, the impact of ICT industries is crucial for increased productivity and efficiency. The value of production is measured using the Value-Added Concept and expressed as the weight of the ICT sector in Total Value Added. The percentage share is calculated by dividing the value added in the ICT sector by the value added in all sectors (all NACE activities).	Continuous	Eurostat
	ICTSPEC	Number (expressed in percentage) of people who are employed as ICT specialists.	Continuous	Eurostat
	INTERIND	The percentage of individuals using the Internet for online banking and shopping.	Continuous	Eurostat

**Table 3.** *Cont.*

Type	Variables	Description	Measurement Level	Source
	CORRIND	The Corruption Perceptions Index ranks countries by their perceived levels of corruption per economic sector. Generally, this index defines corruption as an abuse of entrusted power for private gain.	Continuous	Transparency International
	TOTASS	Total assets are all the assets, or items of value, a small business owns. They are included in total assets: cash, accounts receivable (money owed to you), inventory, equipment, tools, etc.	Continuous	Thomson Reuters (Refinitiv Eikon)
	TOTDE	It measures the combined debts and obligations an individual or company owes to outside parties.	Continuous	Thomson Reuters (Refinitiv Eikon)
	TOTPROF	The amount of profit a company has left over after paying all its direct costs, indirect costs, income taxes, and dividends to shareholders. That represents the portion of the company's equity that can be used, for instance, to invest in new equipment, R&D, and marketing. However, retained earnings can be changed and characterized as a significant revision to a business's accounting configuration. So, investigating the relationship between corruption and retained earnings is crucial.	Continuous	Thomson Reuters (Refinitiv Eikon)
	EBIT	EBIT (earnings before interest and taxes) is a company's net income before income tax and interest expenses are deducted. EBIT is used to analyze the performance of a company's core operations without the costs of the capital structure and tax expenses impacting profit.	Continuous	Thomson Reuters (Refinitiv Eikon)
	NESAS	The result of gross revenue minus applicable sales returns, allowances, and discounts.	Continuous	Thomson Reuters (Refinitiv Eikon)
	TOTSHAST	Illustrates the total value of all a company's shares of stock. The investigation of the relationship between corruption and economic factors and its consequences for economic development has attracted the interest of many economists in recent years globally.	Continuous	Thomson Reuters (Refinitiv Eikon)

The independents are presented in Table 3.

### 3.4. Modelling Procedure

The relationship between the binary response variables was modeled for each model with a set of independent variables (Wang et al. 2020). Out of all the variables included in the three models, the variables that could in some way be assumed to be related to illicit practices and corruption were sorted out while eliminating the strongly correlated ones (Samerei et al. 2021). The considered independent variables and the meanings of their values are given in Table 3. Only the variables significantly mitigating illicit practices and corruption in the financial institutions were included in the models. The regression model coefficient of each significant independent variable explains the type of influence that variable has on the model outcome. The logistic regression model with the selected set of independent variables and estimated model coefficients could be used to predict the probability that the response variable takes a given value (Timoneda 2021).

## 4. Results

### 4.1. Descriptive Statistics Results

Corruption has changed over time, so the adopted practices by the financial institutions need to be adjusted to the new trends of illicit practices. Three binary logistic regression models were developed for 2018, 2019, and 2020. That led to the investigation of the main factors assumed mainly through European financial institutions for handling corruption. The sample used for the analysis consisted of 336 observations collected from Eikon's Datastream for the Fiscal Years 2018, 2019, and 2020.

Table 4 presents descriptive statistics of the panel data sample.

**Table 4.** Descriptive statistics of panel data sample.

Variables	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
BRIBCORR	1008	1.00	0.00	1.00	0.2054	0.40416	0.163	1.461	0.135
ESGSC	1008	92.00	1.80	93.80	47.4164	20.34816	414.048	0.074	−0.576
SOCS	1008	95.90	0.60	96.50	51.0146	21.07920	444.333	−0.153	−0.454
RESOURC	1008	99.90	0.00	99.90	41.3101	30.55491	933.602	0.260	−0.933
EMISSC	1008	99.90	0.00	99.90	44.0504	32.01070	1024.685	0.048	−1.207
ENINSC	1008	99.50	0.00	99.50	32.4422	33.43982	1118.221	0.639	−0.957
WORKSC	1008	98.90	0.90	99.80	63.4137	24.55322	602.860	−0.678	−0.322
HUMRISC	1008	96.20	0.00	96.20	37.2813	32.75454	1072.860	0.313	−1.277
MANAGESC	1008	99.60	0.10	99.70	50.8354	28.17437	793.795	0.072	−1.080
ENERGPROD	1008	15.50	4.10	19.60	10.1754	2.71260	7.358	−0.489	0.600
RENEWA	1008	49.00	7.40	56.40	19.1141	14.09274	198.605	1.913	2.099
RDPERSONSC	1008	0.80	0.50	1.30	0.9090	0.21371	0.046	0.533	−0.460
VHCN	1008	92.40	1.40	93.80	31.2344	26.86868	721.926	0.813	−0.657
GINI	1008	3.20	3.30	6.50	4.9571	0.67088	0.450	−0.191	−0.608
HUMRES	1008	24.60	37.00	61.60	55.4142	5.88920	34.683	−1.725	2.233
COMPUSK	1008	31.00	45.00	76.00	62.7937	6.00803	36.096	−0.859	0.783
ITSPECWORK	1008	19.00	13.00	32.00	23.8958	4.56445	20.834	−0.646	−0.554
ICTCOMPS	1008	4.60	3.00	7.60	5.2646	1.00511	1.010	−0.278	0.343
TRAIPERICT	1008	13.00	6.00	19.00	11.3323	2.43070	5.908	0.394	1.859
ICTEDU	1008	497.50	23.10	520.60	268.6827	127.180	16,174.908	−0.504	−0.313
ICTTOTVA	1008	6.50	0.00	6.50	5.4269	1.23959	1.537	−2.327	6.547
ICTSPEC	1008	2.70	2.20	4.90	3.6346	0.62121	0.386	0.513	0.166
INTERIND	1008	60.00	34.00	94.00	76.4216	11.09818	123.170	−2.016	5.066
CORRIND	1008	36.00	52.00	88.00	78.2768	7.06684	49.940	−2.222	5.983
TOTASS	1008	35,992.80	0.00	35,992.8	339.344	2046.29	4,187,321	13.171	195.451
TOTDE	1008	31,096.30	0.00	31,096.3	307.081	1798.51	3,234,670	12.751	184.598
TOTPROF	1008	4600.60	−11.70	4588.9	23.8333	228.019	51,992.7	17.722	324.876
EBIT	1008	1240.40	−13.60	1226.8	6.2114	63.6450	4050.68	17.141	304.994
NESAS	1008	3188.00	−14.50	3173.5	22.2922	181.977	33,115.8	14.828	233.930
TOTSHAST	1008	5845.20	0.00	5845.2	30.7394	285.066	81,262.8	18.096	340.512

### 4.2. Binary Logit Regression Results

The Binary Logit Regression was performed to assess the factors contributing to illicit business practices. The model contained 29 independent variables. The model was subjected to a multicollinearity test using correlation analysis. The result shows that the variables are free from multicollinearity (Table 5).

Table 5. Correlation matrix.

[illegible]

Table 5. *Cont.*[illegible]

Table 5. Cont.

	BRIBCORR	ESGSC	SOCSC	RESOURC	EMISSC	ENINSC	WORKSC	HUMRISC	MANAGESC	ENERGPROD	RENEWA	RDPERSONSC	VHCN	GINI	HUMRES	COMPUSK	ITSPECWORK	ICTCOMPS	TRAIPERICT	ICTEDU	ICTTOTVA	ICTSPEC	INTERIND	CORRIND	TOTASS	TOTDE	TOTPROF	EBIT	NESAS	TOTSHAST
ICTCOMPS	0.382	−0.004	−0.046	0.007	−0.037	0.018	0.097	−0.014	−0.004	0.223	−0.327	0.045	0.014	−0.326	−0.504	−0.298	−0.154	1.000												
TRAIPERICT	0.169	0.048	−0.035	−0.074	−0.004	0.024	0.002	0.018	−0.019	0.037	0.467	−0.434	−0.197	0.204	0.244	−0.185	−0.535	−0.182	1.000											
ICTEDU	0.472	0.028	−0.014	−0.070	−0.017	0.045	0.010	−0.021	−0.017	0.166	0.439	−0.247	−0.193	−0.278	0.073	−0.286	−0.200	0.241	0.496	1.000										
ICTTOTVA	0.091	0.006	0.016	0.045	−0.057	0.012	−0.028	0.028	0.007	−0.208	−0.520	0.441	0.385	−0.320	−0.527	0.478	−0.025	−0.013	−0.333	−0.430	1.000									
ICTSPEC	−0.147	0.011	0.004	−0.005	0.039	−0.004	−0.038	−0.005	−0.005	−0.140	0.229	−0.188	−0.038	0.153	0.332	0.249	0.076	−0.425	0.491	0.244	−0.340	1.000								
INTERIND	0.279	0.038	−0.007	−0.017	−0.064	0.009	−0.010	−0.014	−0.030	0.066	0.179	0.167	−0.366	0.076	−0.476	0.130	−0.529	−0.009	0.275	0.218	0.272	−0.121	1.000							
CORRIND	−0.378	−0.040	0.011	0.010	0.043	−0.003	0.042	−0.018	0.016	0.278	−0.381	0.267	−0.063	0.210	0.007	−0.596	0.193	0.355	−0.484	−0.357	−0.103	−0.624	−0.464	1.000						
TOTASS	0.094	0.101	−0.083	0.056	−0.046	0.057	−0.125	0.084	−0.047	0.023	0.069	−0.044	0.042	−0.100	−0.013	0.108	−0.044	−0.080	0.036	0.055	0.075	−0.014	0.085	−0.123	1.000					

Table 5. Cont.

	BRIBCORR	ESGSC	SOCSC	RESOURC	EMISSC	ENINSC	WORKSC	HUMRISC	MANAGESC	ENERGPROD	RENEWA	RDPEROSC	VHCN	GINI	HUMRES	COMPUSK	ITSPECWORK	ICTCOMPS	TRAIPERICT	ICTEDU	ICTTOTVA	ICTSPEC	INTERIND	CORRIND	TOTASS	TOTDE	TOTPROF	EBIT	NESAS	TOTSHAST
TOTDE	−0.100	−0.107	0.088	−0.054	0.047	−0.058	0.122	−0.085	0.054	−0.025	−0.069	0.046	−0.048	0.105	0.009	−0.109	0.049	0.081	−0.037	−0.060	−0.076	0.015	−0.087	0.127	−0.999	1.000				
TOTPROF	−0.104	−0.040	0.019	−0.074	0.036	−0.091	0.124	−0.060	0.002	0.024	−0.086	0.061	−0.034	0.114	0.050	−0.136	0.003	0.072	−0.037	−0.026	−0.099	0.021	−0.098	0.128	−0.673	0.655	1.000			
EBIT	0.049	−0.051	0.091	0.004	0.113	−0.057	−0.035	0.042	0.070	−0.025	−0.034	0.025	0.059	−0.050	0.038	−0.021	−0.009	0.002	−0.015	0.072	0.015	−0.003	−0.022	−0.021	−0.303	0.292	0.184	1.000		
NESAS	−0.074	−0.029	−0.027	−0.068	−0.037	−0.014	0.160	−0.051	−0.040	0.009	−0.024	−0.009	−0.051	0.097	0.006	−0.083	0.003	0.074	0.002	−0.068	−0.071	−0.006	−0.038	0.095	−0.685	0.672	0.579	−0.308	1.000	
TOTSHAST	0.110	0.118	−0.101	0.000	−0.101	0.079	−0.022	−0.025	−0.133	0.045	0.023	−0.066	0.079	−0.097	0.006	0.100	−0.048	−0.052	0.026	0.033	0.057	−0.031	0.081	−0.120	0.393	−0.414	−0.478	−0.441	0.010	1.000

The complete model containing all the predictors was statically significant,  $\chi^2$  (29,  $n = 1008$ ) = 166.0,  $p < 0.001$ , indicating that the model was able to distinguish between entries of illicit practices (1) and those without illicit practices (0). The R square value from the Cox and Snell model and the Nagelkerke model presented between 15% and 23% of the variation (Table 6). About nine independent variables are significant.

**Table 6.** Binary logit regression results.

<b>R-Square</b>					
Cox and Snell	0.152				
Nagelkerke	0.238				
Variables	Coefficient	S.E.	Wald	Sig.	Odd Ratio
ESGSC	−0.013	0.027	0.230	0.632	0.987
SOCSC	0.008	0.014	0.276	0.600	1.008
RESOURC	0.002	0.006	0.176	0.675	1.002
EMISSC	0.007	0.005	1.752	0.186	1.007
ENINSC	0.002	0.004	0.260	0.610	1.002
WORKSC	−0.002	0.008	0.094	0.759	0.998
HUMRISC	0.001	0.004	0.065	0.798	1.001
MANAGESC	−0.016	0.009	2.955	0.050	1.016
ENERGPROD	−0.069	0.063	1.185	0.276	0.933
RENEWA	0.017	0.028	0.379	0.538	1.017
RDPEROSOC	−2.376	1.673	2.018	0.155	0.093
VBCN	−0.020	0.009	4.702	0.030	0.981
GINI	0.466	0.319	2.136	0.144	1.594
HUMRES	0.166	0.064	6.702	0.010	1.181
COMPUSK	−0.025	0.064	0.158	0.691	0.975
ITSPECWORK	−0.098	0.057	2.919	0.038	0.907
ICTCOMPS	0.056	0.316	0.032	0.859	1.058
TRAIPERICT	0.305	0.134	5.153	0.023	1.356
ICTEDU	−0.001	0.002	0.081	0.776	0.999
ICTTOTVA	−0.485	0.232	4.355	0.037	0.616
ICTSPEC	1.687	0.648	6.770	0.009	5.405
INTERIND	−0.100	0.036	7.755	0.005	0.905
CORRIND	0.040	0.073	0.300	0.584	1.041
TOTASS	−0.006	0.009	0.459	0.498	0.994
TOTDE	0.008	0.009	0.824	0.364	1.008
TOTPROF	0.013	0.010	1.506	0.220	1.013
EBIT	−0.028	0.035	0.665	0.415	0.972
NESAS	−0.004	0.007	0.287	0.592	0.996
TOTSHAST	−0.030	0.008	13.629	0.000	0.971
Constant	−9.587	3.017	10.100	0.001	0.000

Based on the findings of the binary logit regression analysis on panel data, the main variables that significantly affect the decrease of corruption imply that an environment characterized by HUMRES, TRAIPERICT, INTERIND is more prone to corruption practices. Specifically, an area of risk for the development of corruption phenomena, which can be related to human resources (HR), concerns the mobility of employees between departments. Clear rules to deal with the phenomenon of jumping from one department to another and vice versa include waiting periods and the effective implementation of checks and transfers between the two departments, as well as the application of dissuasive sanctions in case of violation of the rules. Thence, it is important to support managers in their role as leaders in ethical issues, establish clear mandates, provide organizational support, develop an internal HR control system, and provide legal advice. Additionally, the provision of systematic training and guidance to increase awareness and develop skills related to the exercise of unpaid judgment in matters where public integrity issues may arise is equally important.

On the other hand, variables of MANAGESC, VHCN, ITSPECWORK, ICTTOTVA, ICTSPEC, and TOTSHAST are not characterized as a pathway of corruption within a

company. For example, MANAGESC, which indicates a company's commitment and effectiveness towards following best practice corporate governance principles, does not significantly affect corruption. That implies that a business that has invested in issues regards the enhancement of corporate governance and the recruitment of human resources that expertise in emerging technologies can be factors that can prevent illegal activities in a financial institution. Precisely, corporate governance can guide financial institutions to increase the investors' confidence, develop the value of the shareholders and the interested members, and confirm the equality and transparency of each interested party. Thus, the compliance of each company in the financial sector with the rules of corporate governance can contribute to the prevention of financial fraud and thereby strengthen the confidence of the investing public and long-term economic development.

## 5. Discussion

Corruption is commonly known as any intentional and dishonest action that commits to gaining an advantage (Li and Ferreira 2011; Saha et al. 2009). It can be engaged by one or more members of the administration, those in charge of the government, officials, or third parties, which involves using deceit to gain an unfair or unlawful advantage. Corruption is a big challenge and a risk that all companies face. Although corruption is not an issue that any company wants to deal with, the reality is that most companies experience fraud to some degree (Park and Xiao 2021). Every year, massive amounts are lost due to corrupt actions in the company, which greatly affects the company's employees, stakeholders, and business performance. Severe fraud cases can lead the company to insolvency and bankruptcy (Khan and Krishnan 2021).

The phenomenon of corruption systematically occupies the global financial sector and can take various forms (Lakshmi et al. 2021). However, in recent years, the European financial sector has shown signs of improvement in the level of corruption and the transition from an informal economy to a sustainable one (Ferris et al. 2021). Although, developing appropriate strategies to combat illegal activities in the market is a significant challenge for European financial institutions. However, executives present weaknesses in analyzing and interpreting in-depth the main trends and characteristics of corruption in the market (Arayankalam et al. 2021). This study focuses on illustrating new trends and channels of economic corruption. The analysis shows the new flows of corruption channels between South Africa and the countries of North-Western Europe. Illicit practices and corruption have been at the core of discussions due to the negative impact of these harmful practices on sustainable and economic regional development. In addition, the dimension of the COVID-19 pandemic has been an unfavorable condition for the budget deficit situation in some African countries, so the mobilization of domestic resources should be further strengthened, and illegal outflows addressed. Due to the vital link between North-Western Europe and South African countries, the close partnership of governments should be a priority. Europe can support African countries such as Nigeria, South Africa, the Democratic Republic of the Congo (DRC), and Ethiopia to curb illicit capital outflows and boost domestic fundraising. This can be achieved by developing a set of best practices that will make the regions of Africa sustainable and resilient.

In addition, the novelty of our research is its contribution to the reduction of corruption cases in the European financial sector during the pandemic by identifying the crucial factors that can act as a pathway or not to illegal practices. The overall output of the binary logit regression model on panel data for 2018 to 2020 indicated that European financial institutions are less likely to fall into illegal practices. Regarding the findings from the analysis, the above may be based on the crucial role of good practices related to corporate governance. Corporate governance is the corporate guidance to increase investor confidence, develop shareholder value, stakeholder value, and ensure equity and transparency for all stakeholders. Therefore, the fact that the sample of this study indicates to be less vulnerable to illegal practices highlights their compliance with the rules of corporate governance, which contributes to the prevention of financial fraud,

thereby strengthening the confidence of the investing public and long-term economic development. However, financial institutions should enhance their defense against illicit practices and corruption, and to achieve that, the effectiveness of corporate governance is characterized as paramount. Corporate governance should establish appropriate practices, principles, and legal system changes for all businesses to be effective. Essential factors for the effectiveness of corporate governance are the observance of the four basic principles. Specifically, all company participants should emphasize responsibility, accountability, honesty-impartiality, and transparency. Therefore, corporate governance's effectiveness can contribute to reducing financial statement fraud.

In contrast, ineffective governance can bring opposite results to customers and investors, affecting entire economies. It should be clarified that the systems, rules, and principles of corporate governance are not the same from country to country and depend on the characteristics and environment of the business activity of each country. Therefore, for corporate governance to be effective, it is necessary to establish rules and practices and create appropriate systems that will go hand in hand with the business characteristics of each country.

Furthermore, findings indicate that emerging technologies are a key component of the businesses' strategies against illicit practices and corruption and the effective promotion of transparency in all areas of the finance sector. The rapid development and spread of ICT led to the acceptance of e-governance (Adam and Fazekas 2021). The services provided through this new approach are constantly being upgraded in addition to the wealth of information and the essential elements that a business exchange daily. ICT offers access to more value-added services and transactions, thus providing comfort, efficiency, and transparency (Malanski and Póvoa 2021). Moreover, among the effects of emerging technologies included in the fight against corruption are the reduction of bureaucratic entanglements and the removal of administrative barriers, which harm entrepreneurship and damage the healthy competition of businesses.

Moreover, ICT can contribute to the digitalization of the financial sector and ensure transparency. Indicatively, some policies of digitalization can be the following: (i) the wide use of electronic corporate bonds, with standardized features and lower management costs, accessible even by a smaller company, (ii) the use of so-called "smart contracts" which correspond to digital transaction protocols that automatically execute, control, and/or document legally relevant events and actions according to the terms of a contract or agreement, (iii) the use of blockchain technology (i.e., decentralized databases managed by various participants), which offers transparency in transactions and significantly reduces the risk of hacking, as well as compatibility with other platforms for future collaborations or mergers, and (iv) the use of DLT (Digital Ledger Technology), which is a technological infrastructure that allows simultaneous access, validation, and updating of documents in a reliable way over a network (Mirtsch et al. 2021; Korpysa et al. 2021). However, apart from the contribution of emerging technologies, the reforms adopted by governments in the financial sector can be important tools in the fight against fraud and corruption in the financial sector and elsewhere (Jha 2019, 2020). For example, Member States have adopted actions related to reducing tax fraud and tax evasion by promoting high standards of tax governance at a global level. Based on the above insights, a proposal for future research can be the investigation of these reforms of governments and their contribution to the mitigation of corruption in the finance sector during the period of the COVID-19 pandemic.

Based on the current analysis, however, a decisive factor for the development of corruption and opacity phenomena is the role of human resources. Human resources employed in science and technology have fulfilled the following conditions: a completed education at the third level but not formally qualified as above can be related to corruption issues. Thus, this is due to companies' staffing practices of hiring people with completed education but insufficient qualifications, no moral background, and no interest in their official duties, with simultaneous non-merit selection. Additionally, the inequality in the distribution of personnel, the overlapping responsibilities, and the selection of managers

based on political and party criteria because of the lack of meritocracy contribute to the spread of delinquent behaviors by human resources.

Therefore, companies need to take measures that can contribute to the improvement of corporate governance, such as the implementation of appropriate management structures, providing incentives to those exercising management to act within predetermined limits, and making it clear in the business environment that there are no opportunities, nor tolerance, for the development of fraud within it (Ferris et al. 2003). The most basic measures that companies can take to improve their governance in the direction of avoiding fraud phenomena are: (i) the design and operation of an adequate internal control system, which assesses the company's vulnerabilities and potential risks of fraud, (ii) the participation in the management of independent members of the Board of Directors, whose selection is demonstrably done through transparent procedures, (iii) the continuous training of members of the Board of Directors, Audit Committees (where they exist), and executives of the company regarding their role and the recognition of fraud elements, as well as their treatment, (iv) the adoption of a corporate governance code that is applicable, flexible, and easy to evaluate, both in its closed use as well as historically, (v) the design of regulations adapted to the operations of the company, with a gradation of approval powers, which promotes the internal communication and cooperation, especially in family businesses, in which a healthy relationship between members of the same family must also be arranged, and (vi) the development by the management of a code of ethics with a clear development of the business culture, the limits of professional behavior, and the measures to be taken in case of deviation (Guo et al. 2020; Cole et al. 2021). The code must be known to all staff. In small businesses, this code may be verbal but communicated to their members through regular meetings with management as part of healthy corporate communication.

## 6. Conclusions

In the financial sector, there is a field whose purpose is to combat fraud perpetrated against it (Suh and Shim 2020). These people, who are positioned to prevent this phenomenon and fight it with various methods, argue that there are many concepts to determine what is fraud and what is not. Through the daily work in a financial institution, different definitions can describe fraud in the financial sector (Hilal et al. 2022). The Association of Certified Anti-Fraud Examiners defines fraud as follows: "any illegal action characterized as fraud, concealment, or breach of trust (Hilal et al. 2022; Suh and Shim 2020). These actions do not depend on the threat of violence or coerced violence. Fraud is carried out individually by each one but also by organizations with an ultimate goal of the gain of money, property, or services, meaning the avoidance of payment or loss of services or the securing of personal or professional advantage. In addition, the American Institute of Certified Public Accountants describes fraud as: "a broad legal concept distinguished from wrongdoing and depending on whether acts are intentional or not" (Bakre 2007; Papík and Papíková 2022). However, regardless of which of the above concepts one can consider for fraud, it has been proved that almost all fraud incidents fall into one or two specific categories related to theft and cheating.

To limit the concept of fraud to a criminal act in the financial industry, the aim of this study was to highlight the research trends in the field and the main factors that affect, positively or negatively, issues related to fraud and corruption in the sector. The binary logit regression analysis on panel data presents corporate governance and emerging technologies as the factors that can help financial institutions to mitigate corruption issues. Moreover, human resources were highlighted as the factor that can enhance corruption issues within a financial institution.

To combat fraud, therefore, in financial institutions, all stakeholders must seize the opportunity to work together to strengthen the entire financial information ecosystem. Therefore, based on the findings of the current research, European financial institutions, in cooperation with the relevant bodies, should focus their strategies on two main points: (i) on strengthening corporate governance and (ii) on the systematic integration of emerging

technologies into internal control procedures to avoid phenomena that are related to fraud and corruption. The achievement of strong corporate governance and standards for maintaining effective internal control over financial reporting should be a prerequisite for listing on a major stock market index, as is already the case in many countries (Yang et al. 2017). That would immediately improve standards and reduce the risk for investors. As part of the system of internal control over financial information, companies should also be required to address the risk of fraud and define clear and specific roles for each stakeholder, including management, the board of directors, the audit committee, and the internal audit (Broadstock and Chen 2020). Based on that, it is reasonable to support the application of the management's signature on the internal control of the financial report. In addition, supervisory regulators must be strong and equipped with powers and technology. There is clear evidence of the effectiveness of strong regulatory authorities in combating corporate fraud in many parts of the world. Whether fighting fraud or financial crime, European supervisors could consider pooling their resources to pursue international fraudsters and initiate common or harmonized supervision across national markets.

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## References

- Abbink, Klaus, and Kevin Wu. 2017. Reward self-reporting to deter corruption: An experiment on mitigating collusive bribery. *Journal of Economic Behavior and Organization* 133: 256–72. [\[CrossRef\]](#)
- Adam, Isabelle, and Mihály Fazekas. 2021. Are emerging technologies helping win the fight against corruption? A review of the state of evidence. *Information Economics and Policy* 57: 100950. [\[CrossRef\]](#)
- Arayankalam, Jithesh, Anupriya Khan, and Satish Krishnan. 2021. How to deal with corruption? Examining the roles of e-government maturity, government administrative effectiveness, and virtual social networks diffusion. *International Journal of Information Management* 58: 102203. [\[CrossRef\]](#)
- Aria, Massimo, and Corrado Cuccurullo. 2017. bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics* 11: 959–75. [\[CrossRef\]](#)
- Bakre, Owolabi M. 2007. The unethical practices of accountants and auditors and the compromising stance of professional bodies in the corporate world: Evidence from corporate Nigeria. *Accounting Forum* 31: 277–303. [\[CrossRef\]](#)
- Binhadab, Nouf, Michael Breen, and Robert Gillanders. 2021. Press freedom and corruption in business-state interactions. *Economic Systems* 45: 100922. [\[CrossRef\]](#)
- Broadstock, David, and Xiaoqi Chen. 2020. Corporate site visits, private monitoring and fraud: Evidence from China. *Finance Research Letters* 40: 101780. [\[CrossRef\]](#)
- Chan, Kenneth S., Vinh Q. T. Dang, and Tingting Li. 2019. The evolution of corruption and development in transitional economies: Evidence from China. *Economic Modelling* 83: 346–63. [\[CrossRef\]](#)
- Cole, Rebel, Sofia Johan, and Denis Schweizer. 2021. Corporate failures: Declines, collapses, and scandals. *Journal of Corporate Finance* 67: 101872. [\[CrossRef\]](#)
- Eurostat. 2021. Enterprises That Provided Training to Develop/Upgrade ICT Skills of Their Personnel. Available online: [https://ec.europa.eu/eurostat/databrowser/view/ISOC\\_SKE\\_ITTN2/default/table?lang=en&category=isoc.isoc\\_sk.isoc\\_skt](https://ec.europa.eu/eurostat/databrowser/view/ISOC_SKE_ITTN2/default/table?lang=en&category=isoc.isoc_sk.isoc_skt) (accessed on 7 November 2022).
- Ellegaard, Ole, and Johan A. Wallin. 2015. The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics* 105: 1809–31. [\[CrossRef\]](#)
- Ferris, Stephen P., Jan Hanousek, and Jiri Tressl. 2021. Corporate profitability and the global persistence of corruption. *Journal of Corporate Finance* 66: 101855. [\[CrossRef\]](#)
- Ferris, Stephen P., Murali Jagannathan, and Adam C. Pritchard. 2003. Too Busy to Mind the Business? Monitoring by Directors with Multiple Board Appointments. *Journal of Finance* 58: 1087–112. [\[CrossRef\]](#)

- Ganda, Fortune. 2020. The influence of corruption on environmental sustainability in the developing economies of Southern Africa. *Heliyon* 6: e04387. [\[CrossRef\]](#) [\[PubMed\]](#)
- Gillies, Alexandra. 2020. Corruption trends during Africa's oil boom, 2005 to 2014. *Extractive Industries and Society* 7: 1171–81. [\[CrossRef\]](#)
- Gou, Xiaoqing, Hui Liu, Yujie Qiang, Zhihui Lang, Haining Wang, Dong Ye, Zhiwen Wang, and Han Wang. 2022. In-depth analysis on safety and security research based on system dynamics: A bibliometric mapping approach-based study. *Safety Science* 147: 105617. [\[CrossRef\]](#)
- Guo, Ying, Lifang Wang, and Qian Yang. 2020. Do corporate environmental ethics influence firms' green practice? The mediating role of green innovation and the moderating role of personal ties. *Journal of Cleaner Production* 266: 122054. [\[CrossRef\]](#)
- Hauk, Esther, Mónica Oviedo, and Xavier Ramos. 2022. Perception of corruption and public support for redistribution in Latin America. *European Journal of Political Economy* 74: 102174. [\[CrossRef\]](#)
- Hilal, Waleed, S. Andrew Gadsden, and John Yawney. 2022. Financial Fraud: A Review of Anomaly Detection Techniques and Recent Advances. *Expert Systems with Applications* 193. [\[CrossRef\]](#)
- Hope, Kempe Ronald. 2020. Channels of corruption in Africa: Analytical review of trends in financial crimes. *Journal of Financial Crime* 27: 294–306. [\[CrossRef\]](#)
- Jain, Ritika. 2020. Bribery and firm performance in India: A political economy perspective. *Journal of Asian Economics* 68: 101181. [\[CrossRef\]](#)
- Jha, Chandan Kumar. 2019. Financial reforms and corruption: Evidence using GMM estimation. *International Review of Economics & Finance* 62: 66–78. [\[CrossRef\]](#)
- Jha, Chandan Kumar. 2020. Financial Reforms and Corruption: Which Dimensions Matter? *International Review of Finance* 20: 515–27. [\[CrossRef\]](#)
- Khan, Anupriya, and Satish Krishnan. 2021. Moderating effects of business-systems corruption on corruption in basic national institutions and electronic government maturity: Insights from a dynamic panel data analysis. *International Journal of Information Management* 59: 102349. [\[CrossRef\]](#)
- Korpysa, Jaroslaw, Marcin Halicki, and Andreas Uphaus. 2021. New financing methods and ICT versus logistics startups. *Procedia Computer Science* 192: 4458–66. [\[CrossRef\]](#)
- Lakshmi, Geeta, Shrabani Saha, and Keshab Bhattarai. 2021. Does corruption matter for stock markets? The role of heterogeneous institutions. *Economic Modelling* 94: 386–400. [\[CrossRef\]](#) [\[PubMed\]](#)
- Lalmi, Abdallah, Gabriela Fernandes, and Souad Sassi Boudemagh. 2022. Synergy between Traditional, Agile and Lean management approaches in construction projects: Bibliometric analysis. *Procedia Computer Science* 196: 732–39. [\[CrossRef\]](#)
- Li, Dan, and Manuel Portugal Ferreira. 2011. Institutional environment and firms' sources of financial capital in Central and Eastern Europe. *Journal of Business Research* 64: 371–76. [\[CrossRef\]](#)
- Lino, André Feliciano, Ricardo Rocha de Azevedo, André Carlos Busanelli de Aquino, and Ileana Steccolini. 2021. Fighting or supporting corruption? The role of public sector audit organizations in Brazil. *Critical Perspectives on Accounting* 83: 102384. [\[CrossRef\]](#)
- Malanski, Leonardo Köppe, and Angela Cristiane Santos Póvoa. 2021. Economic growth and corruption in emerging markets: Does economic freedom matter? *International Economics* 166: 58–70. [\[CrossRef\]](#)
- Mangoma, Arinao, and Anthony Wilson-Prangley. 2019. Black Tax: Understanding the financial transfers of the emerging black middle class. *Development Southern Africa* 36: 443–60. [\[CrossRef\]](#)
- Mirtsch, Mona, Knut Blind, Claudia Koch, and Gabriele Dudek. 2021. Information security management in ICT and non-ICT sector companies: A preventive innovation perspective. *Computers and Security* 109: 102383. [\[CrossRef\]](#)
- Papík, Mário, and Lenka Papíková. 2022. Detecting accounting fraud in companies reporting under US GAAP through data mining. *International Journal of Accounting Information Systems* 45: 100559. [\[CrossRef\]](#)
- Park, Byung Il, and Shufeng(Simon) Xiao. 2021. Doing good by combating bad in the digital world: Institutional pressures, anti-corruption practices, and competitive implications of MNE foreign subsidiaries. *Journal of Business Research* 137: 194–205. [\[CrossRef\]](#)
- Rojas-Lamorená, Álvaro J., Salvador del Barrio-García, and Juan Miguel Alcántara-Pilar. 2022. A review of three decades of academic research on brand equity: A bibliometric approach using co-word analysis and bibliographic coupling. *Journal of Business Research* 139: 1067–83. [\[CrossRef\]](#)
- Rose, Kalle Johannes. 2020. Introducing the missing 11th principle of the United Nations Global Compact to reach sustainability—Follow the money . . . . *Journal of Money Laundering Control* 23: 355–67. [\[CrossRef\]](#)
- Saha, Shrabani, Rukmani Gounder, and Jen Je Su. 2009. The interaction effect of economic freedom and democracy on corruption: A panel cross-country analysis. *Economics Letters* 105: 173–76. [\[CrossRef\]](#)
- Salahuddin, Mohammad, Nick Vink, Nicholas Ralph, and Jeff Gow. 2020. Globalisation, poverty and corruption: Retarding progress in South Africa. *Development Southern Africa* 37: 617–43. [\[CrossRef\]](#)
- Samerei, Seyed Alireza, Kayvan Aghabayk, Nirajan Shiwakoti, and Amin Mohammadi. 2021. Using latent class clustering and binary logistic regression to model Australian cyclist injury severity in motor vehicle—Bicycle crashes. *Journal of Safety Research* 79: 246–56. [\[CrossRef\]](#)

- Silke, Andrew. 1998. In defense of the realm: Financing loyalist terrorism in Northern Ireland—Part one: Extortion and blackmail. *Studies in Conflict and Terrorism* 21: 331–61. [[CrossRef](#)]
- Soans, Aaron, and Masato Abe. 2016. Bribery, corruption and bureaucratic hassle: Evidence from Myanmar. *Journal of Asian Economics* 44: 41–56. [[CrossRef](#)]
- Suh, Joon Bae, and Hee Sub Shim. 2020. The effect of ethical corporate culture on anti-fraud strategies in South Korean financial companies: Mediation of whistleblowing and a sectoral comparison approach in depository institutions. *International Journal of Law, Crime and Justice* 60: 100361. [[CrossRef](#)]
- Tabak, Benjamin Miranda, Thiago Christiano Silva, Marcelo Estrela Fiche, and Tércio Braz. 2021. Citation likelihood analysis of the interbank financial networks literature: A machine learning and bibliometric approach. *Physica A: Statistical Mechanics and Its Applications* 562: 125363. [[CrossRef](#)]
- Timoneda, Joan C. 2021. Estimating group fixed effects in panel data with a binary dependent variable: How the LPM outperforms logistic regression in rare events data. *Social Science Research* 93: 102486. [[CrossRef](#)]
- Uberti, Luca J. 2021. Corruption and growth: Historical evidence, 1790–2010. *Journal of Comparative Economics* 50: 321–49. [[CrossRef](#)]
- Vian, Taryn. 2020. Anti-corruption, transparency and accountability in health: Concepts, frameworks, and approaches. *Global Health Action* 13: 1694744. [[CrossRef](#)] [[PubMed](#)]
- Wang, Yuwei, Zongyao Sha, Xicheng Tan, Hai Lan, Xuefeng Liu, and Jing Rao. 2020. Modeling urban growth by coupling localized spatio-temporal association analysis and binary logistic regression. *Computers, Environment and Urban Systems* 81: 101482. [[CrossRef](#)]
- Yang, Dan, Hao Jiao, and Roger Buckland. 2017. The determinants of financial fraud in Chinese firms: Does corporate governance as an institutional innovation matter? *Technological Forecasting and Social Change* 125: 309–20. [[CrossRef](#)]
- Zhang, Xinyuan, Qing Xie, and Min Song. 2021. Measuring the impact of novelty, bibliometric, and academic-network factors on citation count using a neural network. *Journal of Informetrics* 15: 101140. [[CrossRef](#)]