Information Availability and Security and Foreign Corrupt Practices Act Cases

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Abstract - Foreign Corrupt Practices Act deals with businesses found guilty of bribing foreign officials. The increasing number of cases and high financial penalties present a growing concern for businesses operating or planning to start operating abroad. The ratings of Transparency International offer an indicator of corruption in countries; however, the analysis shows that this indicator is not correlated with the occurrence of FCPA cases in a particular country. This article shows that the level of availability of information is more important in predicting and potentially preventing the need for FCPA investigations whilst the level of information security is correlated with the perception of corruption and not directly linked to the number of FCPA cases. Using the data of cases filed in 2016-2017, the article discusses how the factors of information availability and security influence the likelihood of an FCPA investigation in a country. The article contributes to empirical studies on corruption by focusing on fact-based data on corruption as opposed to perception-based data and shows that these two sets of data do not correlate. Significant correlations between various measures of information availability in countries with the differing level of human development suggest that both companies and societies can leverage from the availability of information to use different informational practices and policies strategically to combat bribery.

Index Terms - Bribery, FCPA, Corruption, Information

I. INTRODUCTION

The Foreign Corrupt Practices Act (FCPA) was introduced in 1977 and applies to all U.S. persons, companies originating from the United States, certain foreign issuers of securities, and foreign firms and persons who cause directly or through agents an act of furtherment of corrupt payments (bribes) outside the territory of the United States. FCPA regulations are often discussed in the law research [1], [2]; however, Koehler [3] defined the FCPA as a general business issue that needs to be on the radar of managers operating in the global marketplace. The recent McKinsey's and KPMG's corruption cases in South Africa confirm that FCPA investigations can cause considerable disruption to a business in, potentially, any country.

Bribery payments are covert acts that are not easy to detect [4]. Even if detected, FCPA cases are difficult to support with enough evidence, as information sources of evidence are either not available or not secure, that is, could be tampered with. Based on that, it seems plausible that access-to-information laws have a direct impact on both the discovery and resolution of FCPA investigations. Access-to-information laws are balanced against the requirements for the protection of private information, such as the Protection of Private Information Act [5] in South Africa and similar laws in other countries. Companies that operate in several jurisdictions find it increasingly difficult to navigate the landscape of often contradictory regulatory requirements. For example, a company is typically subject to U.S. trade sanctions that require information disclosure if its parent company is from the United States or if the company has U.S. Employees. At the same time, the company is also subject to local laws that may require information protection and non-disclosure of private information. While the interpretation of the regulatory requirement fits firmly into the area of law, managers may benefit from better understanding of general trends of FCPA prosecutions, case investigations, and factors contributing to them.

A   The gap in knowledge

Previous authors pointed to the lack of empirical as opposed to descriptive research on corruption [6]. Descriptive research usually deals with one country [7]–[9], while multiple-country comparisons usually rely on perceptions of corruption [8], [10]–[12]. However, both businesses and societies can benefit from understanding the trends of actual corruption prosecutions as opposed to perceptions and non-generalizable descriptions. This understanding is especially useful for the management of international firms who deal with corruption as a cultural practice of a foreign country and who have a limited ability to get a deep understanding of this other culture. Governments can also benefit and use this knowledge to design and implement legislation that can reduce corruption while encouraging business development and international cooperation. Most of the previous research on the FCPA is descriptive and deals with the interpretation of

particular cases [1], [2]. Despite providing useful insights, such research misses the more general trends that are particularly important for strategists whose job is to leverage from recognizable patterns of corruption and suggest strategies for expansion/shrinkage of business in various countries.

FCPA investigations mostly point to the confirmed or alleged cases of bribery. Bribery is a part of the larger problem of corruption, which also includes embezzlement, financial fraud, self-dealing, extortion [2], [13]. Thus, research based on FCPA cases is an opportunity to add a quantitative measure to corruption as opposed to corruption perception [14]. Such research is also quantitative contribution to the body of knowledge on FCPA cases.

Previous researchers of information influence on corruption reported incoherent results. The adoption of the Internet has been found to have a positive effect on the reduction of corruption, but this effect was suggested to remain only partially realised [11]; this conclusion was based on significant but small correlations between the adoption of the Internet and corruption perceptions. In another research, using data from 128 countries between 1984 and 2004 authors found that the adoption of Freedom of Information (FOI) laws had no particular effect on corruption except in developing countries, where the adoption of the FOI laws appeared to increase the perception of corruption, which was used as a proxy to corruption levels [12]. Other authors confirmed the effectiveness of the Right to Information (RTI) laws for curbing corruption based on interviews with both bureaucrats and activists [7].

Many authors inquired which factors are important indicators of corruption and what is the role of information and communication technology (ICT) in exposing corruption. Previous authors [15] found that the Corruption Perception Index (CPI) by Transparency International depends mostly on historical colonialism, economic measures such as Gross Domestic Product (GDP), and the historical development of political institutions - factors that are hard to change. The debate has also remained unresolved about the accuracy of corruption measures. The questions have been asked about the relationship of corruption measurements and exposed corruption with the overall level of corruption in a country [16]. For instance, perception-based indexes, such as the CPI, rely on the opinions of local people, business-people, and experts. These opinions are not separate from the context and depend on what people read in newspapers, what political rhetoric they are exposed to, and what they hear from their peers [16]. Other authors questioned the overall definition of corruption and the possibility of eliminating corruption as a cultural norm [4], [17]. Srivastava, Teo and Devaraj [6] suggested that only the integration of psychological and economic factors can reflect the full picture. This article does not intend to engage in this philosophical debate; instead, it aims to demonstrate quantifiable facts and statistical evidence to support further philosophical elaboration.

B   Research Purpose

The purpose of this article is both theoretical and practical. The theoretical goal is to obtain a better understanding of what combination of socio-economic and informational measures leads to a higher number of FCPA cases across countries. Informational measures are operationalised here as a combination of information security and information availability factors. The number of FCPA cases is taken both as an indicator of bribe-paying behaviour and pathways to the prosecution of such behaviour. In such an interpretation, the variables contributing to the higher number of FCPA cases may be interpreted as factors leading to the exposure of bribery and corruption, thus providing the regulators with the estimate of the effectiveness of particular measures. The practical contribution is in recommendations for businesses on evaluating the combination of informational and socio-economic factors in a country to anticipate and curb bribery, which could lead to an FCPA case and mitigate the impact of FCPA investigations.

Overall, the paper answers the question: what combination of socio-economic, information availability, and information security factors is associated with the higher propensity of FCPA investigations.

II. LITERATURE REVIEW

The general information about the prevalence of corruption is largely inaccessible because corruption deals are covert and often no evidence of them exists [18]. Information transparency is often considered to be the opposite of corruption [18]. Under conditions of secrecy, information disclosure, often associated with whistleblowers, becomes dangerous for those who disclose the information. Rothschild and Miethe [19] found that whistleblowers suffered significant retaliation from their management especially when the information disclosure revealed routinised corrupt behaviour that was essential to the organisation's profit-making. In other words, conditions of information secrecy are associated with a significant barrier to breaking corrupt patterns of behaviour. However, another pattern of crime is based on the illegal use of information, such as identity theft, leakage of unverified government information, the location of protected persons, corporate espionage, and so on. Previous research [20] found a particularly strong effect of this type of unofficial information in societies where the access to verified information is limited. The existence of information stealing and misuse explains the need for keeping some of the information in secret, especially in environments where other forms of legal protection are unreliable, and the level of crime is high. Thus, information –

used both to reveal and perpetuate corruption - is akin to currency in corruption deals.

Most of the previous research dealt with the perception-based indicators of corruption. Perceptions of corruption are also used by Transparency International – the world's authority in providing corruption ratings. Despite being widely used, corruption perceptions are subject to criticism and disagreement in academia. Mashali [8] found that when citizens perceived high levels of corruption in the state departments, this perception drove the statesmen to become corrupt. This is aligned with the constructivist view of corruption as an informal institution that perpetuates itself [4], [17], [21]. Thus, sharing of information about corruption may be associated with corruption perpetuation. Vadlamannati and Cooray [12], on the other hand, claimed that the perception of corruption when combined with the existence of FOI laws tends to decrease corruption over time. Yet another opinion is that perception of corruption is driven by the accessibility to information such as discussion of corruption in the media, informal conversations within social groups, and so on [16]; it is plausible that through these pathways the perception of the corruption level reinforces itself through creating a stable interpretation of the level of corruption. This interpretation may be isolated from the reality to some degree. In such a case, a more systematic means of disclosing information about corruption may be essential. Relly [21], [22] developed a model which confirmed that the legislation for the media rights, the use of the Internet and cellphones, electoral pluralism, and other elements of political culture negatively relate to the level of perception of corruption. Overall, the problem with using the perception of corruption as a dependent variable of the level of information accessibility is in the theoretical probability that the perception of corruption is dependent on what information is shared and how it is presented [23]. Thus, instead of perception, more objective measures of corruption (such as the number of corruption investigations) should be used to define the relationship between the availability of information and the level of corruption.

In line with these findings, Okello-Obura [13] claimed that the main difference between countries is the level of corruption and the systems that are in place to prevent and expose corruption. The previous discussion on the ease of perpetuation of corruption and the difficulty of breaking the pattern also confirms that it is better to prevent corruption than to remedy the damages [9]. The FCPA regulations are one of the systems put in place to expose corruption; FOI, RTI laws, and accounting standards are the others [9]. Accounting is perhaps one of the oldest systematic controls that are in place and has been discussed in detail by many scholars of accounting. Zaman and Ionescu [9], for example, demonstrated how simultaneous undervaluing and overvaluing of assets whose market value is difficult to estimate, creates opportunities for companies to both lower their tax bills and

increase their value in the eyes of potential investors. Higher transparency of corporate information together with open-to-public electronic systems for registering asset-exchange transactions may help the reduction and even elimination of corruption through double accounting.

Similar and complementary to the public transactional registry systemic measure for fighting corruption is e-governance, which is defined as the use of ICT by governments to expedite and improve the provision of services to its citizens [6]. Srivastava, Teo, and Devaraj [6] found that e-governance is negatively associated with the level of corruption in national institutions: political, legal, and the media. Building upon Serra's [15] sensitivity analysis, which established that the existence of long-established democratic institutions in a country is robustly associated with the reduction of corruption, it is possible to infer that e-governance could be the mechanism for the establishment of such democratic institutions.

The other opinion is that systems for protecting information rights are essential to human wellbeing [24]. Some authors argue that the confidentiality of information is necessary for businesses to maintain their competitive advantage [3]. While both the proponents of the freedom of information and confidentiality offer convincing arguments, the situation is not easily comparable in different countries where the needs for disclosure are different due to the established cultural practices of doing business. For example, several European countries do not have formal laws for information sharing [25]; however, these countries offer their citizens access to extensive datasets covering information on public governance and business information. Thus, practically these laws are replaced by implicitly established practices. On the contrary, European countries have put forward the new European Union Data Protection Regulation [26], which has entered into force in May 2018. This regulation focuses on the restriction and confidentiality of access to information. At the same time, the U.S. Office of Foreign Assets Control (ORAC) imposes requirements on businesses to identify their clients in order to prevent money laundering and terrorism financing. This law requires the disclosure of such information to the government agents when the need arises. The differences in the focus of information regulation between the European Union and the United States could be explained by many cultural and historical factors, which are not the focus of this article. What is important for the present discussion is that for the businesses operating in several jurisdictions, these laws create a substantial compliance obstacle as the requirements are often contradictory.

Given the importance of information in both perpetuation and curbing of corruption, research linking corruption indicators to information availability and security is needed. Previous research has established the correlation of corruption levels with the wealth of the nation, the history of political

institutions, and the history of colonization [15] – all the factors that are difficult or even impossible to change. It could also be argued that lower levels of corruption lead to higher wealth, better political institutions, and political and social stability, thus giving no answer regarding what practical measures should be used to achieve these lower levels. At the same time, information sharing and protection, as shown by successes of e-governance [6] and the developments in the social media, are rather fluid and easily influenced. Theoretically, sharing of verified information may offer the ability to lower the levels of corruption by providing a climate where secrecy is increasingly problematic and corrupt behaviour is difficult to hide. However, this may only be useful where the risk of losing private information is not critical to survival (as it is crucial in war-zones, highly criminalized environments, or very poor countries). The analysis in the article aims to evaluate the potential of informational measures in global anti-bribery efforts while taking into account the difference in the development state of the nations.

III. HYPOTHESES DEVELOPMENT

The CPI developed by Transparency International is one of the most widely-used indicators of corruption. It is based on the views on the public-sector corruption that are collected from surveying the general public, analysts, and business people. As noted in the previous research [8], perceptions may also cause perpetuation of corruption. The further question that could be asked is what is the mechanism of this causal relationship: for example, perceptions of corruption could cause an increase in the probability of a business being involved in an FCPA case. It is plausible that businesspeople feel pressure to pay bribes in more corrupt environments [2] and therefore become subjects of an investigation. To test the relationship between the CPI and the probability of FCPA investigation, the following hypothesis is suggested:

Hypothesis 1. There is a correlation between the CPI and the occurrence of FCPA cases.

It is likely that perceptions of corruption are not the only factor contributing to the occurrence of FCPA cases. The media has been suggested to be one of the foundational institutions for curbing corruption [6]. The power of the media is in its ability to reach and influence a wide audience. This often comes at the cost of filtering information and favouring particular interpretations [23]. The manipulative power of the media is particularly high in the environments where verification of data through public means is not possible and the accountability cannot be enforced [20], [27]. Accountability may be one of the motivations for whistleblowers to disclose information. The lack of accountability on the societal level may also mean the lack of personal motivation to notify the authorities of the cases of

bribery and corruption. The lack of access to information can also prevent potential whistleblowers from contacting the authorities because their information may be hard to verify. To test the relationship between the openness of information and the effectiveness of revealing corruption the following is proposed:

Hypothesis 2. There is a relationship between the public access to information and the number of FCPA cases revealed.

The damage of corruption for businesses is not only in the long-ingrained unfair competition practices and reputational damages but also in the short-term damages suffered from being investigated. These damages may be even more unpleasant as some of the investigations are triggered by other businesses who are interested mainly in causing disruption in the workflow of the competitor [3]. Such occurrences are more probable where the tip-offs are difficult to verify, in other words, in environments with the limited access to information. The difficulty of verification may be measured using FCPA case duration, that is, the time interval between the opening of the case and its closure. Duration can also be seen as an indicator of the amount of work required for an investigation.

Hypothesis 3. The duration of FCPA cases is associated with the measures for information availability.

Another important question is the relationship of information security to corruption prevention or revealing corruption. Corrupt and illegally obtained information, on its own, can be used in many kinds of unlawful behaviours that may be part of a grander corruption scheme. The lack of information security often manifests in breaches. Potentially, breaches of information may aid the discovery of corruption:

Hypothesis 4. The number of information breaches correlates with corruption indicators.

The possibility of a productive corruption investigation is likely dependent on the judicial and governance systems that are in place. As more developed countries possess more developed judicial and governance systems, which are important for fighting corruption [15], it is plausible that the level of development would affect both the level of information availability and the occurrence and duration of FCPA cases.

Hypothesis 5a. The measures of information availability and FCPA cases are correlated with the socio-economic level in the country.

Another way to see the dependence between socio-economic level and the number of FCPA cases is through the lens of the overall wellness and quality of living in a nation. The Human Development Index (HDI), as a composite indicator of income, health, and education level in a country[28], provides a suitable proxy for this purpose. The inclusion of the education level is important because

information has been shown to have different impact depending on the education level of the audience [24].

Hypothesis 5b. The HDI moderates the dependency between the occurrence of FCPA cases and information measures.

IV. Method

To test the hypotheses proposed above, the analysis relied on the data from secondary sources. For the initial analysis that aimed to reveal the potential correlations and predictive ability of different indicators, the authors relied on a cross-sectional selection of data for 2016-2017. The data on FCPA cases, their dates, and involved countries were taken from the FCPA biannual report of Shearman and Sterling, LLP covering 2016-2017 [29]. The authors used individual cases unsealed in a year instead of FCPA groups used in the report (FCPA group is one or more FCPA cases that share a common bribery scheme, location or time interval). The advantage of using such a dataset is in a slightly more granular understanding of the involved businesses and individuals, as

cases create a major hassle for companies and individuals preventing them from their normal business activities. All of the datasets were processed using Python 3.6 and Pandas 0.22. Ordinary Least Squares method was used for statistical correlation analysis. PyMuPDF 1.13 package was used to scrape data off PDF reports. The values of indicators were extracted into Pandas Dataframe format (columns representing indicators, rows representing countries). The source code for the data extraction and processing is available in GitHub on request. The description of the datasets is provided in Table 1.

The report by Shearman and Sterling, LLP was preprocessed to extract the number of cases per country and to calculate the duration of cases, as the number of years between the date the case commenced and the date it was finalised. The duration was further processed as the mean duration of cases per country and the sum of years that the cases stayed open per country. The complete Right to Information dataset [25] was used.

Overall, 76 countries were common among the datasets and were used for the initial correlation analysis. For Hypothesis 5b, insignificant variables were dropped: this

Table 1
Description of datasets

Indicator	Description	1) Range 2) Mean 3) STDEV	Source
Count of FCPA cases	The number of FCPA cases unsealed in a country. Data for 2016-2017.	1) 1-78 2) 6.7 3) 11.1	[29]
Aggregate duration of FCPA cases	The number of years between the date the case commenced and the date it was finalised aggregated for all case per country. Data for 2016-2017.	1) 10-1453 2) 738.0 3) 506.9	[29]
Gini coefficient	Gini coefficient measures inequality as the distribution of family income in a country. The lower the coefficient the more equal are families in the country in terms of income. Gini coefficient of zero corresponds to complete equality; Gini coefficient of 100 corresponds to complete inequality. Data for 2016.	1) 25-63 2) 39.6 3) 8.2	[30]
Corruption Perceptions Index	CPI is a complex index based on a combination of perceptions of business people and expert opinion. CPI focuses particularly on the perceptions of corruption in the public sector. The index ranges from zero to one hundred, where zero indicates perception of high corruption and one hundred – the perception of no corruption. Data for 2017.	1) 0-87 2) 39.7 3) 16.9	[31]
Nominal Gross Domestic Product (GDP)	GDP is the total sum of gross value added by all residents of the country. GDP includes product taxes and excludes subsidies. Values used in this article were measured in billions USD. Both nominal GDP and Purchasing Power Parity (PPP) were used. Data for 2016.	(GDP): 1) 2-17420 2) 662.0 3) 2199.6 (GDP PPP): 1) 0-21409 2) 1061.0 3) 3133.8	[32]
HDI	Index measuring the level of human development in a country based on education, health, and the level of income. Data for 2016.	1) 0.35-0.93 2) 0.7 3) 0.2	[28]
Extent of Corporate Transparency	The index measures the following dimensions of Corporate Transparency: disclosure of ownership stakes, compensation, audits and financial prospects. Data for 2017.	1) 0-9 2) 4.9 3) 2.5	[33]

Disclosure Index	This index defines to what degree investors are protected through disclosure of ownership and financial information. Data for 2017.	1) 1-10 2) 6.2 3) 2.5	[33]
Breaches	This is the number of isolated incidents of data breaches per country. Data for 2016.	1) 0-1766 2) 22.0 3) 187.2	[34]
Reliability and transparency of tariffs	This index measures reliability and transparency of electricity tariff information as a critical measure of doing business in a country. Data for 2017.	1) 0-8 2) 4.0 3) 3.2	[25]
Scope of RTI laws	The level to which the information is accessible to every legal and physical person. Data for 2017.	1) 12-30 2) 25.0 3) 5.3	[25]
Sanctions and Protections	The existence of sanctions for those withholding information and protections for whistle-blowers. Data for 2017.	1) 0-7 2) 3.2 3) 2.2	[25]
Total RTI score	This is the sum of all values of RTI indicators. Data for 2017.	1) 46-136 2) 89.6 3) 21.7	[25]
Right of Access	This index measures the level of regulatory right to access the information in general and the information held by public authorities. It also accounts for the broad interpretation of RTI law. Data for 2017.	1) 0-6 2) 3.9 3) 1.7	[25]
Promotional Measures	Promotional Measures include the requirement for establishment of a central body for promoting information access, compiling consolidated report regarding the implementation of information access regulations, the appointment of persons responsible for ensuring the compliance with the requirements of information disclosure, public awareness-raising campaigns, the existence of a system for ensuring the standards of records management, creation of public registries of records, training programmes, and reporting of public authorities on the actions taken to implement their disclosure obligations. Data for 2017.	1) 0-16 2) 5.5 3) 5.3	[25]

allowed the authors to remove the datasets with insignificant variables and among the remaining datasets, 89 countries were in common for 2016-2017. This extended dataset was used for constructing regression models where the count of FCPA cases was the dependent variable and different information measures were considered as independent variables. Countries that were missing in indicator datasets were omitted. The list of countries is available in GitHub, while pre-processed datasets can be made available on request. Though omitted countries can potentially carry important information, the lack of indicator values usually corresponds to the practical difficulty of gathering the relevant information; thus, only assumptions can be made about the influence of these countries. Relying on such assumptions was considered inconsistent with the approach taken in this study. As cross-sectional data, this dataset cannot capture the change over time, thus, giving only an indication about the state of the world in 2016-2017. However, the short time interval allowed removing the dependency introduced by the development of the DOJ and the Securities Exchange Commission (SEC) units designated for FCPA investigations. Thus, the biannual snapshot demonstrated the differences in the FCPA investigations that are characteristic of the countries as opposed to being characteristic of the developments in FCPA investigation and enforcement practices.

V. FINDINGS

Table 2 below presents correlations of information measures with the number of FCPA cases. For brevity, indicators from the Right to Information dataset that showed no significant correlations are not presented.

TABLE 2
CORRELATION WITH THE COUNT OF FCPA CASES

Measure	Correlation with the count of FCPA cases. R-values are expressed in %, p-values are given in brackets.
GDP PPP, billion USD	59% (0.000)
GDP, billion USD	36% (0.002)
Promotional Measures	27% (0.019)
Disclosure index	26% (0.027)
Corporate transparency	25% (0.031)

Table 3 below presents correlations of information measures with the aggregate duration of FCPA cases.

TABLE 3
CORRELATION WITH THE AGGREGATE DURATION OF FCPA CASES

Measure	Correlation with the aggregate duration of FCPA cases. R-values are expressed in %, p-values are given in brackets.
GDP PPP, billion USD	54% (0.000)
GDP, billion USD	32% (0.005)
Corporate transparency	28% (0.015)
Promotional Measures	28% (0.016)
Disclosure index	27% (0.018)

Table 4 below summarises the hypotheses testing results.

TABLE 4
HYPOTHESES TESTING RESULTS

Hypothesis	Accepted/rejected
H1	Rejected
H2	Accepted
H3	Accepted for sum duration Rejected for mean duration
H4	Rejected for FCPA case count Accepted for CPI
H5a	Accepted for GDP PPP
H5b	Accepted

Further discussion explains the results of hypotheses testing.

A   Corruption Perceptions

H1 proposed that there is a correlation between the CPI and the occurrence of FCPA cases. No significant correlation was found (r=-12% with p-value of 0.24). This result shows that perceptions of corruption do not give country managers sufficient information about the risks of being investigated for bribery in line with the FCPA. As suggested in the previous research [3], these risks may be driven by the actual opportunity for corruption as well as by bad-meaning competitors. Further results suggest that this opportunity may be partially explained by the availability of and access to information.

B   Access to Information

The results showed a positive correlation between the availability of information and the number of cases, thus, confirming H2. This is measured by Corporate Transparency: r=25% with p=0.031 and Disclosure Index: r=26% with p=0.027. It is important to note that these measures are cross-correlated (r=39%, p=0.026). Corporate Transparency is also correlated with Gini index: r=-34% (p=0.004). This

correlation means that higher inequality is associated with lower Corporate Transparency. Corporate Transparency is also correlated with the CPI (r=40%, p=0.001), which means that higher Corporate Transparency is associated with lower perception of corruption. Based on the dependency between Corporate Transparency and several other measures, it can be suggested that Disclosure Index is a more suitable measure for prediction of FCPA cases. Its contribution also stays significant when the duration of cases is concerned. Further Granger-causality testing is required to prove these suggestions.

Promotional Measures are significantly (p=0.019) and positively (r=27%) correlated with the number of FCPA cases. This result may indicate that the promotion of information disclosure creates an environment where whistleblowers are more encouraged to come forward with the information about corrupt actions. Though an FCPA case opening is not in the immediate interest of companies, the companies may use this finding to promote information transparency and disclosure within the company thus gaining the opportunity to resolve problems internally before the information becomes known to the DOJ or the SEC.

C   Duration of FCPA Investigations

H3 proposed testing the correlation between the duration of FCPA cases and measures of information availability. For the duration, the sum of years that the cases lasted and the mean duration of cases was calculated. The sum of years was found to significantly correlate with Promotional Measures (r=28%, p=0.016), Corporate Transparency (r=27%, p=0.015), and Disclosure Index (r=27%, p=0.178). As the sum of years includes both the count and the duration of cases, measures contributing to it are important in anti-bribery efforts.

On the other hand, the mean duration was not found to be significantly correlated with any of the tested measures. It can be concluded that the mean duration of cases is poorly explained by the variables used in this study. This can be explained by the higher reliance of the duration of a single investigation on the investigation-level factors than on the country-level factors. The sum duration is more suitable as an indication of the amount of time spent on investigations in the country in total.

D   Information Breaches

H4 proposed that the lack of information security, which manifests in breaches, may also correlate with corruption indicators. While no correlation was found with the number of FCPA cases, a correlation was found with the CPI and the GDP. This analysis was done in two stages: with and without the U.S. data (see Table 5). These two stages allowed to restrict the influence of the U.S. data on the analysis: the United States had more than 1700 breach cases compared to the maximum of 71 cases in the rest of the dataset. In the

analysis with the U.S. data, breaches were found to be significantly and negatively correlated with the CPI (r=-28%, p= 0.016) and positively with the GDP (r=82%, p<0.000). This can lead to the conclusion that the higher number of breaches is associated with higher perceived corruption. But without the U.S. data, the breaches were found to be significantly and positively correlated with the CPI (r=34%, p= 0.028) and the GDP (r=27%, p=0.020). In other words, breaches are associated with lower perception of corruption, which can be explained by the higher level of information available in electronic form in countries with higher GDP and lower corruption levels.

TABLE 5
INFORMATION BREACHES

Measure		Correlation with the number of breaches. R-values are expressed in %, p-values are given in brackets.
With U.S. data	GDP	83% (<0.000)
	CPI	-28% (0.016)
Without U.S. data	GDP	27% (0.020)
	CPI	34% (0.028)

E   Socio-Economic Factors and Human Development

H5a proposed the relationship between the measures of information availability, duration, and the number of FCPA cases and the socio-economic situation in a country. Gini index was found to be significantly and negatively correlated with the CPI (r=30%, p=0.008) and Corporate Transparency (r=39%, p=0.001). In other words, higher Corporate Transparency is associated with lower inequality (higher Gini). The CPI is a reversed index, that is, the higher the index the lower is the perception of corruption. Thus, lower corruption perception is associated with lower inequality or, in other words, in countries with lower inequality, people perceive corruption levels to be lower as well.

The other socio-economic measure, the GDP PPP, was found to be significantly correlated with the number of cases (r=58%, p<0.000), Corporate Transparency (r=26%, p=0.027), and Disclosure Index (r=23%, p=0.047). This correlation confirms the previous findings of the importance of the nation's wealth in anti-corruption work as the GDP PPP is associated with the higher number of FCPA cases as well as the slightly higher Corporate Transparency and Disclosure Index.

H5b proposed a moderating effect of the HDI on the relationship between information measures and the number of FCPA cases. To estimate this moderating effect, a linear regression model was built on the dataset (87 countries) that excluded Gini index, breaches, GDP PPP as the variables that had shown no significance for estimating the number of cases:

$$Count \sim gdp + pm + rt + ra + sp + scope + di + cti \quad (1)$$

where

$Count$ is the count of FCPA cases;

gdp is nominal GDP in billions of USD;

pm is Promotional Measures Indicator;

rt is Reliability and Transparency of Tariffs Indicator;

ra is Rights of Access indicator;

sp is Sanctions and Protections indicator;

$scope$ is the Scope of RTI laws;

di is Disclosure Index;

cti is Corporate Transparency Indicator.

All the combinations of variables were tested until a statistically significant model was found:

$$Count = 0.0018*gdp + 0.7322*pm \quad (2)$$

To visually estimate the moderating effect of the HDI, the number of FCPA cases (actual and modelled using (2)) was plotted against the level of human development in Fig. 1. From Fig. 1, it can be seen that the model is particularly inaccurate in the middle of the graph, which corresponds to medium and high levels of HDI (see Table 6).
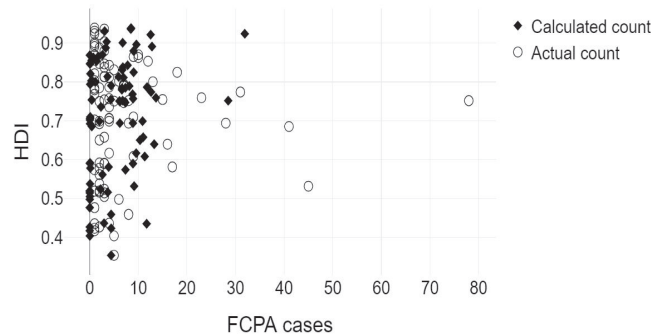

Fig. 1. FCPA cases and the level of Human Development.

TABLE 6
HUMAN DEVELOPMENT INDEX GROUPS

HDI Group	HDI Range
Very high HDI	0.8 to1.0
High HDI	0.7 to 0.8
Medium HDI	0.555 to 0.7
Low HDI	0.0 to 0.555

To improve the predictive ability of the model (2), four models corresponding to the different levels of HDI were developed. Before the development of these models, an HDI model was constructed to check for the correlation with the other independent variables used. The GDP was excluded from the HDI model because the HDI depends on the GDP by definition. Out of the remaining variables, the model was found to be significantly dependent on *cti* and *rt*, therefore the presence of these variables in the four models was associated with the dependence on the HDI. *Ln(Count)* was used in the following models, firstly, to accommodate the exponential tendency of the dependency and, secondly, to ensure the absence of negative values in the dependent variable (the number of cases is always more than 0).

1)   Very high Human development
The data on 21 countries with very high HDI were present in the dataset. For these countries, the count of FCPA cases was found to be proportional to Right of Access, Sanction and Protections, and Disclosure Index:

$$ln(Count) = 0.2844*ra + (-0.2582)*sp + 0.1310*di \quad (3)$$

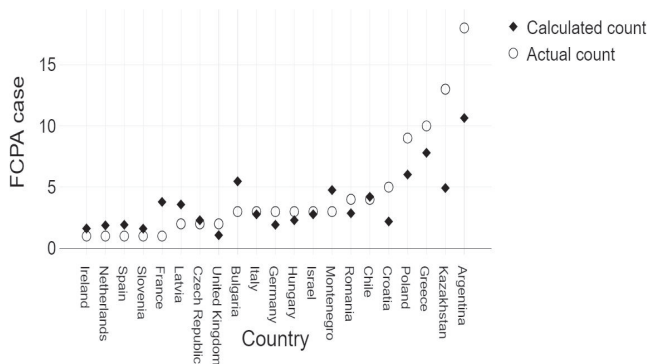This model allowed explaining 82.8% of the variance (R-squared). This is presented in Fig. 2:

Fig. 2. Very high HDI model.

2)   High human development
The dataset contained eighteen countries with high HDI. For this group, the following model was constructed by testing combinations of all possible independent variables:

$$ln(Count) = 0.5313*rt + 1.077*ra - 0.2112*scope \quad (4)$$

This model allowed explaining 78% of the variance. The model results are shown in Fig. 3.
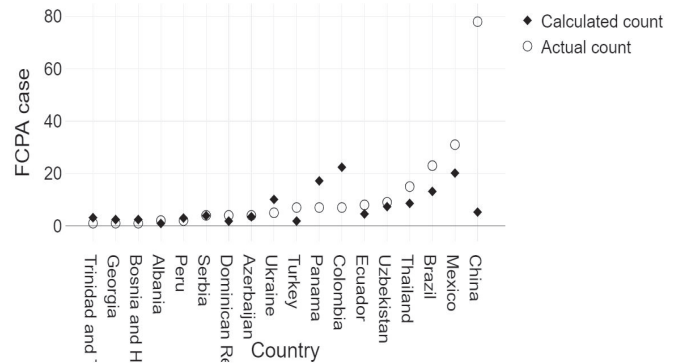

Fig. 3. High HDI model.

The dependence of the count on Reliability and Transparency of electricity tariff, *rt*, indicated a correlation with the HDI, which was indeed found and the count of the cases was found to be significantly correlated with the HDI:

$$ln(Count) = 2.238*score \quad (5)$$

where

score is the HDI score.

Formula (5) allowed explaining 67.5% of the variance, confirming that non-informational measures are not sufficient to explain the occurrence of FCPA cases.

3)   Medium human development
Medium HDI countries were represented by thirteen data points in the dataset. For this group, the following model was constructed by testing combinations of all possible independent variables:

$$ln(Count) = -0.3124*sp + 0.2584*di + 2.0947*score \quad (6)$$

This model explained 86% of the variance as shown in Fig. 4.
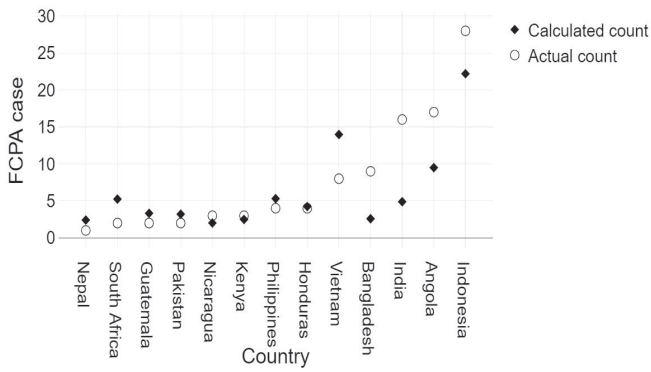
-     Fig. 4. Medium HDI model.

4)   Low human development

The dataset contained eight low-HDI countries. For this group, the following model was constructed by testing combinations of all possible independent variables:

$$ln(Count) = 0.014*total\_inf \qquad (7)$$

This model explained only 46.7 %. The low accuracy of the model is likely due to the low number of observations. The model is presented in Fig. 5.
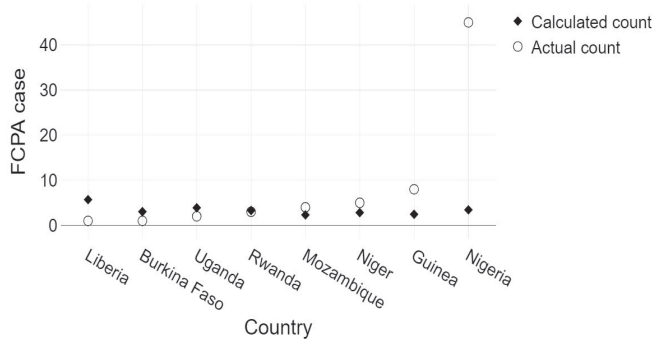

Fig. 5. Low HDI model.

VI. Discussion and Implications

Overall, the findings indicated that information availability is associated with the discovery of FCPA cases. The analysis also addressed the limitation of corruption perceptions, which was previously associated with the perpetuation of corruption [4]. The findings in this article confirmed the previous results that FOI laws increase the perception of corruption [10]. More precisely, the more practically tangible measure of the number of FCPA cases increases with the increase in the level of Promotional Measures. The increase in the number of cases may improve awareness and thus increase the perception of corruption. Previously, Costa [10] found that the perceptions

of corruption do not decrease in subsequent years. This may be explained by the fact that societal perceptions are generally difficult to change. Thus, the count of FCPA cases seems to be a more useful measure for evaluation of the effects of the promotion of information disclosure. Further longitudinal research is required to confirm the proposition about the influence of FOI laws on the reduction of corruption. The openness and availability of information may reveal the disconnect between the stable perceptions in a society and the reality, thus increasing the likelihood of societal change.

Despite the benefits of the discovery of the bribery cases being generally obvious for the society, negative consequences are also possible. Koehler [3] demonstrated how an FCPA investigation may create many negative consequences for business firms, including pre- and post-enforcement professional fees, problems with mergers and acquisitions, market capitalization, and time reallocation from other business activities and goals. This may also explain the offensive use of the FCPA by competitors for gaining the edge in business competition. Stevenson and Wagoner [1] mentioned other major social implications of company prosecutions, including job loss, disruption of service, and loss of business. This immediate damage may also translate to even wider societal negative implications, such as the increase in unemployment, the drop in the GDP, and so on. Thus, corruption mitigation initiatives may result in unexpected consequences.

The duration of cases was found to be positively correlated with the information availability. Thus, it may seem that information availability does not contribute to expediting the prosecution. This counterintuitive relation may be explained by the aggregation of time, that is, more cases of shorter duration can take more time overall compared to one long case. The finding that out of all indicators in the Right to Information dataset, only Promotional Measures significantly contribute to the propensity of FCPA investigations in all countries can be explained by the difference in the rights prescribed by law and the actual implementation of laws. This was noted in the research that discussed how activist groups sometimes have to fight for the enforcement of rights to information laws [35]. A form of such activism may be hacktivism, which achieves the goals of transparency through data breaches. On the other hand, breaches seem to be associated with an increase in the perception of corruption, which may draw attention to corrupt activities and lead to further discovery of FCPA cases. The recommendation for businesses is thus to ensure that damage from information breaches is minimised. For example, the promotion of information sharing among employees was previously found to be an effective measure for mitigating the impact of breaches [36].

Corporate Transparency was used as a proxy measure of information sharing. Corporate Transparency was found to be

important in revealing FCPA cases. The atmosphere of general transparency and the encouragement of information sharing may also help with the creation of the atmosphere of safety for whistleblowers who often suffer retaliation from the management [19]. These results suggest that companies may reduce the damage to themselves by promoting information disclosure (for example, through the creation of departments or child companies that focus on making the information public). This may also assist the DOJ and the SEC by providing guidance on clear and quantifiable benefits of self-reporting as suggested in the previous research [37].

The overall low correlations between the indicators used in this study and the occurrence of FCPA cases may be interpreted as the confirmation of the previous finding that the adoption of the Internet has a positive effect on reduction of corruption, but this effect is yet to be fully realised [11]. On the other hand, it may also mean that dissimilarity between countries with different levels of development requires different measures to be used in the fight against corruption. This latter proposition was confirmed in the analyses stratified by the HDI level.

In the very-high-HDI countries, the following information measures showed to have a significant role in aiding the disclosure of bribery: Right of Access, Sanctions and Protections, and Disclosure Index. These factors allowed to explain a large portion of the data (82.8%). This can be interpreted as the high importance of information in societies with a high level of development. As a very-high HDI level is associated with a high level of education in the country, the latter conclusion complements the previous finding that information has more impact in anti-corruption work in places where the audience is more competent in comprehending and interpreting the information [10]. The discovered impact of Sanctions and Protections is also aligned with the previous finding of the importance of the governance structures in anti-corruption work [15], [21].

In the high-HDI countries, the main significant factors were Reliability and Transparency of information on electricity tariffs, Rights of Access, and the Scope of RTI regulations. These factors are particularly relevant for day-to-day businesses activities and allow businesses and the public to protect themselves from unfair practices (such as unpredictable tariff increases or bribery in public procurement). This finding can also mean that in high-HDI societies, the information can be used successfully in the resolution of disputes.

In the medium-HDI countries, Sanctions and Protections, Disclosure Index and the HDI score were found significant in predicting the occurrence of FCPA cases. This finding can indicate the higher impact of regulations in such societies. Compared to the high-HDI countries, in the medium-HDI countries, businesses and individuals are less likely to seek justice themselves but the imposition of regulatory information measures is likely to achieve its goals.

In the very-low-HDI countries, information measures could not be used to explain the data well. The only significant correlation was found with the total score of all information measures, thus, not allowing to contribute to the purpose of this article, which was stated as the exploration of the individual measures of information that are relevant to anti-bribery work. This finding can be explained by the lack of education and governance structures in the societies with a very low HDI level. In such a situation, available information either cannot be interpreted correctly or cannot be used for dispute resolutions at courts. The recommendation for the very low-HDI societies is to focus more on the other measures that can fight corruption, such as stimulating the economy, improving the public education system, and strengthening the governance structures. It is likely that without these measures the impact of information measures would be unreliable.

In both the very high- and the high-HDI countries, Rights of Access were found significant in anti-bribery work. This correlation may indicate that citizens of these societies have the ability to comprehend and disseminate information better and use the information for the benefit of the society with a lesser reliance on the interpretation by the state.

In both the high- and the medium-HDI societies, a dependence between the level of the HDI and the number of FCPA cases was observed. This dependence can indicate that higher levels of development allow the allocation of more resources to anti-bribery work. In such a case, the increase in the level of development works together with the information measures to reveal corruption.

Overall, the increase in information rights promotion, disclosure and corporate transparency requirements are associated with the higher number of FCPA cases. Despite the desirability of finding and prosecution of the guilty persons (physical and legal), the prosecutions are also associated with some undesirable side-effects, such as the loss of business continuity, job loss, and, in extreme cases, an overall negative impact on the economy. Considering these negative side-effects, the models stratified by the HDI developed in this article allow better understanding of the level and scope of informational measures that contribute to the propensity of FCPA investigations. The analysis of information security measures in this article did not establish any significant correlation with the propensity of FCPA investigation; however, the link was established with the corruption perception indicator. This link can mean that information security is likely to affect the perceptions of corruption as opposed to the propensity of an FCPA investigation. The findings advance the work on the dependency of information availability and corruption by focusing on particular measures of information availability that are relevant for disclosing bribery and corruption in different societies. These findings can be improved in future research by conducting a longitudinal study that compares the situation before and after the implementation of informational measures.

A   Limitations

Cross-national studies introduce concerns of cultural differences across countries. This is particularly relevant if corruption is seen as a cultural institution. From the research point of view, taking a macro perspective inevitably closes off the views from ethnic-cultural and micro-individual perspectives. This study is also different from the organisational perspective: despite the propensity of corporations to unify practices, there exist differences in how businesses operate, especially in different and volatile political environments. Other limitations of this study are the limited time scope of the data and the reliance on secondary sources whose data collection procedures could not be verified.

B   Future Work

In the previous discussion, Yockey [2] urged to shift some of the punishments from bribe-paying companies to bribe-seeking officials. Building upon the findings of the importance of information and the previous work on the potential of e-governance to improve the corruption levels in a country, this article supports this conclusion. However, e-governance alters the agent-principal relationship between the public sector and the public [38]. This is likely to be a cybernetic relationship that is difficult to understand from a cross-sectional analysis; instead, such understanding would likely benefit from case study approaches.

Finally, the limited time-scope of the analysis in this article is useful for an exploratory analysis across multiple datasets; however, it does not take into consideration the changes in the effects of information availability laws and information security practices over time. Thus, a longitudinal study would be useful in the future.

VII.   Conclusion

This analysis contributed empirically to the literature exploring the relationship between the availability of information and corruption. It confirmed the previous findings on the importance of information for fighting corruption [39]. Unlike the previous works, that found relationships between hard-to-change social factors like the GDP and historical colonization [15], this analysis focused on factors that can be practically influenced by businesses operating in a country.

The stratification of the data based on the level of human development developed a better understanding of what measures are particularly effective in different societies. The understanding can be used by policymakers for selecting the most effective measures while saving costs on the less effective ones. This is particularly important for less developed societies, where the cost of information collection, dissemination, and storage is high in proportion to the size of the economy. As economic development is directly associated

with corruption, proper allocation of resources to high-impact regulatory measures is expected to be beneficial for fighting corruption both by revealing it, making it difficult to conduct, and strengthening the economy.

Overall, the increase in information availability and security may prevent both the possibility of doing corruption and the reification of perceptions about corruption, which can drive the perpetuation of corrupt behaviour. These results should be used by managers of multi-national corporations in developing policies for information sharing, promoting access to information, securing the data, and ensuring the protection of whistleblowers.

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