The law and economics of anti-corruption: the prosecutor's role in negotiated settlements and efficient law enforcement

By

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Abstract

The central topic of this doctoral dissertation is the role of the prosecutor in law enforcement of economic crime - that is, how the organisation of law enforcement agencies, legal procedure and the strength of institutions influence the efficiency of law enforcement. Corruption is a global problem that inflicts serious harm to people and nations. A variety of efforts are put in place to combat corruption. Still, we often lack information on the outcome of these efforts and how they should be structured and organised to reduce corruption. Together with my co-authors, we explore these challenges from three different angles.

First, we investigate prosecutors' freedom when settling a corruption case out of court. Specifically, how 66 countries organise their prosecuting authority when a corruption case is settled without a court case. We find that there is a considerable variation in how countries organise their prosecutors. This variation influences the discretion that the prosecutor is granted to conclude corporate bribery cases with a settlement. We find that the amount of discretion granted to the prosecutor tends to follow a bell-shaped curve when compared to indices on social and economic development. When a country develops, the prosecutor is granted increasingly more independence and discretion. This freedom is later limited by regulation.

Second, we study the difference between the expected sanction in court and the certain sanction of accepting a settlement, which we label the *sanction gap*. We identify aspects of law enforcement that increase or decrease the size of the sanction gap, and the consequences the size of the sanction gap have on the defendant's willingness to accept a settlement offer. We find that when the sanction gap is too large, even innocent defendants will accept a settlement offer rather than taking the risk associated with the uncertain outcome of a court case. We argue that, per expectation, all corporate bribery cases will end in a settlement in the United States under the current legal regime. In contrast, we will see a mix of settlements and court cases in the United Kingdom.

Third, we evaluate the Romanian anti-corruption agency's efforts to tackle corruption. We identify a relationship between a corruption case and the risk of corruption in public procurement on the municipality level. We analyse more than 200 000 procurement contracts for red flags in public procurement. We find a significant decrease in our objective measure of corruption risk after a corruption case. We conclude that reducing corruption risk is related to increased formal compliance with procurement procedure rules. At the same time, the opportunity to use high-risk procedures in public procurement remains prevalent.

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Co-authored with Tina Søreide.

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Article 2

Settlements in Corporate Bribery Cases: The Illusion of Choice?

Co-authored with Tina Søreide.

Published 8 February 2022 in the *European Journal of Law and Economics*.

Article 3

"Impartiality, integrity, efficiency": An Evidence-based Evaluation of the Record of Romania's Anti-corruption Directorate

Co-authored with Mihaly Fazekas and Agnes Batory.

3 Foreword

My first encounter with corruption was along a deserted road towards one of the many surf spots in Bali, Indonesia. The police pulled me over, and as I did not have an international driving permit for driving a scooter, I had to pay a fine. There was no receipt, and by coincidence, the fine's amount was the same as the amount of money I had in my pocket. I did not think much of the incident then, but it struck me how fortunate I am to live in a society where I do not have to bribe the police.

Years later, I discussed different topics for my master thesis with my thesis co-author Stian Tvetene. The seemingly hefty fines imposed on firms convicted of corruption intrigued us. What implications does a penalty like this have on a firm? These were all vast multinational corporations, and even though the size of the fine seemed large when considering the yearly earning of these firms, we were uncertain about its impact. By exploring the development of the value of a firm using stock prices, we investigated whether sanctioned firms performed differently from the general market (S&P500). We could not isolate any difference between the convicted firm and the market, thus indicating that a sanction does not significantly influence the overall performance of the firm. Several reasons can explain this, but more importantly, this led me onto the road of corruption research.

Embarking on my PhD in law and economics, I wanted my research to be relevant not only for the body of science I was contributing to but also ongoing policy work exploring new solutions to some of the many challenges of corruption. I was lucky to have Tina Søreide as my main supervisor, who quickly took me under her wing and brought me right to the centre of policy development. I assisted the Recommendation 6 group that paved the way for new guidelines for harmonising negotiated settlements across the OECD countries.[1] In my first paper, co-authored with Tina Søreide, we study the difference in the prosecutor's degree of discretion in different countries, among those many of the OECD countries.

I have been further motivated by rule of law in negotiated settlements and the power structures that influence a defendant's ability to obtain a fair and just legal process. The use of negotiated settlements has rapidly increased worldwide, and there is little consensus on how settlement-based sanctions should be structured (Søreide & Makinwa, 2020). I find it interesting to study these new approaches on how individuals and firms are held liable for corporate bribery and how the legal framework varies across countries (Moene & Soreide, 2021), while at the same time keeping in mind fundamental legal principles of law enforcement and how law enforcement influences trust in institutions. As the institution with a monopoly on enforcing criminal sanctions, the prosecutor needs to be firmly reviewed in their use of different law enforcement tools, as the consequences can be quite hazardous if not done right. This led to a study on the difference between the expected outcome of a court case, compared with the outcome of a settlement case, and how this impacts the defendant's inclination to accept the settlement or have

[1] See: https://www.nhh.no/en/research-centres/corporate-compliance-and-enforcement/about/guidelines-for-non-trial-resolutions/

the case tried in court.

Finally, I have been intrigued by the efforts put into tackling corruption and the uncertainty of the effect of these efforts. In all corners of the world, there is some sort of effort to do something about corruption, and a wide range of measures has been introduced. Many efforts succeed, but those responsible for good governance are often part of the problem, and therefore, some institutions are de facto designed to fail. A range of aspects such as increased transparency, protection of whistleblowers, fair salaries for public officials, etc. have been introduced with the hope of reducing the harm caused by corruption. In my third paper, we estimate the impact of corruption cases brought by the Romanian anti-corruption agency, on the level of risk of corruption in public procurement on the municipality level.

4 Introduction

Corruption, as "the abuse of entrusted power for private gain" (Transparency International, 2022), represents one of the biggest challenges to developing fair and safe societies (G20, 2014). Therefore we want to hold firms and individuals accountable for corruption. On the one hand, corruption is an increasingly advanced form of crime, crossing borders and facilitated by professional lawyers, auditors, real estate agents, and others. On the other hand, there are efforts that both prevent firms and individuals from corruption and influence the risk of detection once the crime is committed. This section briefly introduces aspects of why and how countries enforce laws against corruption.

According to Basu (2015), since Becker (1968) formalised the model of crime and punishment, the field of law and economics has had an overly strong focus on potential offenders' self-interested motivation to commit or refrain from crime. This tradition in law and economics keeps deterrence as a primary objective of optimal law enforcement. Basu (2015, p. 4) argues that "Corruption, at one level, is simply a problem that arises from people trying to circumvent the law. The high incidence of corruption in a large number of countries, especially emerging economies, is simply a reflection of the poor implementation of the law." This perspective takes a broader approach to crime deterrence by focusing on the "poor implementation of the law", which not only limits the scope of law and economics to an individual or firms' reactions to rules and regulation, but includes aspects related to the strength of institutions and the individuals operating in the law enforcement system. The goal is to consider the more comprehensive governmental system that law enforcement is part of when assessing anti-corruption efforts. This system-wide approach raises questions such as: What are the different reasons governments develop and enforce laws criminalising corruption? How do governments create these systems of law enforcement? What are the different incentives that individuals in the law enforcement system have to align their goals with the aims of society at large? And what aspects of the law enforcement system enable or disable individuals from reducing crime and strengthening the trust in institutions? We aim at addressing some of Basu's concerns in this doctoral dissertation with our analyses of the public prosecutor and the system that the public prosecutor works within.

In a global economy, it is not given that a country will sanction corruption, and even less given when corruption has taken place abroad. However, bribery of *foreign officials* is a requirement for sanctioning individuals or firms for corruption in many jurisdictions, e.g. in the Foreign Corrupt Practices Act (FCPA) from the United States (Foreign Corrupt Practices Act, 1977). A government's efforts to tackle corruption is the result of an ongoing development of different interests that influence anti-corruption initiatives. We have to keep in mind that the opposing interests in a jurisdiction do not only take the position of wanting to eradicate corruption when, at the same time, corruption provides potential business opportunities for domestic firms. However, the effects of anti-corruption efforts are hard to

measure. The result is jurisdictions that introduce laws that they more or less manage to enforce or anti-corruption initiatives with a more or less clear idea of the actual outcome. The motivation for the introduction of new laws or anti-corruption initiatives can be either an effort to comply with an increasing demand of actions against corruption, a genuine willingness to tackle corruption, or avoiding large sanctions for domestic firms.

Soreide (2018) addresses why jurisdictions introduce laws they fail to enforce, through an analysis of the complexity of efficient anti-corruption measures. We might be inclined to assume that a variation of anti-corruption measures will lead to a reduction in corruption. More transparent procedures, protection of whistleblowers and higher sanctions however, will not automatically reduce the level of corruption if these efforts do not influence the detection rate for those involved in corruption, since deterrence depends on the fact that there is an actual or perceived risk of detection, which leads to a substantial sanction. If this is not the case, for any anti-corruption effort, it remains a toothless action with no real impact.

If an effort to tackle corruption does indeed increase the actual or perceived risk of detection, what is the role of the sanction? And does it matter in which format the sanctions are imposed? These questions are at the core of this doctoral dissertation. In articles one and two, we study alternative vehicles for law enforcement, and how sanctions are imposed. It might come as no surprise to the reader, that the format of the sanctions does make a difference. An example of the difference in outcome is studied in article two, where we observe how different forms of sanctioning regimes can lead to a large variation in collateral claims, that follow a criminal conviction. Alexander & Arlen (2018) treat the form of a sanction format by considering the implication on the reputational cost, and how this cost can vary depending on the format of the sanction, and the awarding process of the sanction. Rui & Søreide (2019) dissect the format of anti-corruption regulation through criminal law and administrative law where the potential of corporate self-regulation and the flexibility of settlements are evaluated in opposition to traditional criminal law values. All three papers of this doctoral dissertation relate to the legal framework that regulates corruption, and the difference between anti-corruption regulation through criminal law versus administrative law.

A central theme of this doctoral dissertation is settlement-based enforcement of anti-corruption law which is an umbrella term for different types of settlements, where a criminal or civil law case is concluded without a court proceeding. For simplicity, I use the term "settlement" in this introduction. Makinwa (2015) applies the following definition of a settlement: "A negotiated settlement is an agreed resolution between law enforcement authorities and alleged wrongdoers regarding alleged violations of anti-corruption laws resulting in sanctions or other legal measures". The notion of agreed resolution is important in this definition, as this is what distinguishes a settlement from the traditional enforcement through the court system. Settlements require some form of cooperation between the prosecutors and

the defendants, which is not necessarily the case when the alleged crime is brought before a court. This can, on the one extreme, be as simple as agreeing to the proposed take it or leave it settlement offer, to on the other extreme, a seat at the table when the terms of the settlement are drafted. Across the OECD member countries that have sanctioned firms for corporate bribery, settlements have become the most frequently used form of reaction (OECD, 2019). However, different countries use different types of settlements.

The OECD classifies five different types of settlements: "Form 1 results in the termination of an investigation without prosecution or in the termination of another enforcement action, subject to the fulfilment of specific conditions, notably disgorgement of profits. Form 2 leads to the suspension or deferral of a prosecution or other enforcement action, subject to the fulfilment of specific conditions. Form 3 encompasses all administrative and civil proceedings that result in a final decision imposing sanctions without criminal conviction. Form 4 includes resolutions that amount to a conviction, but do not imply an admission of guilt. Form 5 covers the resolutions equivalent to plea agreement, which require the defendant's admission of guilt and amounts to a conviction. Finally, there are some non-trial resolution systems, identified as "Mixed", which belong to more than one category, because they can take multiple forms or lead to different outcomes depending on the facts of the case" (OECD, 2019, p. 43). The use of settlements is increasing globally, while the organisation of settlements remains diverse.

Another central theme of this doctoral dissertation is anti-corruption agencies (ACAs). ACAs became popular at the turn of the millennium. These agencies are used as a tool to fight corruption, and Dionisie & Checchi (2008) divided ACAs into three categories: (1) Multi-task agencies which combine law enforcement capabilities, with prevention and policy work. (2) Specialised ACAs that concentrate on law enforcement, and work as a section (often independent) of the prosecuting authority. (3) Prevention and coordinating agencies. The Romanian anti-corruption agency (DNA) which we study in paper three falls into the second category. UNCAC Article 36 has often been interpreted by signatories to the UNCAC as a requirement to create one super-enforcement body specialised in corruption crimes. "The UN Convention Against Corruption (UNCAC) alone obliges its signatory countries to implement dozens of legal and institutional anti-corruption measures, which governments typically adopt. However, this may also only be out of governments' eagerness to please foreign investors, and political leaders may also use international standards in an instrumental manner, not (or not only) to fight corruption, but as another technique to gain support from voters or to combat political opposition" (Krajewska & Makowski, 2017, p. 326). The OECD Anti-Bribery Convention does not require signatory countries to create a separate ACA, but the requirements from the convention can be fulfilled by having designated personnel in the existing law enforcement framework working with anti-corruption (OECD, 2008). Several authors have criticised the ACA and questioned the agencies' efficiency as an anti-corruption tool (De Maria, 2008;

De Sousa, 2010; Heilbrunn, 2004; Meagher, 2005). We address this concern in paper three with an empirical evaluation of the efforts of the Romanian ACA.

5 Presentation and discussion of articles

In my first paper, we investigate how the prosecutor's degree of discretion in settlement differs among 66 jurisdictions and the implications of these variations. In my second paper, we study the difference between sanctions given through negotiated settlements, and a court sentence, which we label the sanction gap. In my third paper, we investigate the effect of sanctions brought by the Romanian anti-corruption agency on the municipality level, in order to isolate the effect of sanctions on the risk of corruption in public procurement.

5.1 Article 1: Prosecutors' Discretionary Authority in Efficient Law Enforcement Systems

This article, co-authored with Tina Søreide, was born out of curiosity for how the prosecutor exercises their discretion when corporate bribery cases are settled out of court. When settling a case out of court you take away the independent third party, which the judge serves as in traditional conflict resolution. The consequence is that more power is granted to the prosecutor. The extent of additional power that the prosecutor is awarded depends on how negotiated settlements are constructed, which varies substantially across countries. Some jurisdictions do not formally allow out of court settlements for corporate bribery cases, while others grant their prosecutors wide discretion in settling corporate bribery cases out of court.[2]

We analyse survey data collected by Abiola Makinwa and Tina Søreide in cooperation with the International Bar Association (IBA). This data contains information on how settlements are done in 66 different countries across the world, with the majority of the respondents being from OECD countries. For each country, one member of the IBA has replied to the survey. The respondents are all lawyers and the majority work for private law firms. The survey maps specific attributes of the settlement process, the prosecutors' access to use settlements, and to what extent the prosecutor can influence the content of the settlement. Based on the survey replies, we developed a score on the following subcategories: the prosecutor's opportunity to drop the case, the *de jure* bargaining freedom, the *de factor* bargaining freedom, the number of subjects up for bargaining and post monitoring. Based on the aggregated score, where all subcategories are weighted equally, we develop the Prosecutor Discretion Index (PDI).

The PDI enables us to compare the degree of discretion granted to the prosecutor between the 66 different countries, which has not been systematically studied before. The drawback of using survey data is that we only observe a subjective representation of a situation at a given point in time. It is likely that there is a deviation between the respondent's point of view on the prosecutor's discretion and

[2] A short version of this paper was one of the winners of the Youth ResearchEdge competition at the OECD Integrity Forum in 2018. See: https://www.oecd.org/corruption/integrity-forum/2018/

the actual degree of discretion. However, to our knowledge, there is no exact way to measure discretion, and survey data is, therefore, one of the best options available. All responses from each lawyer were available online, with the names of the respondent publicly available, which we believe will strengthen the accountability of the respondent to conduct a thorough investigation into the matter as part of answering the survey.

We find that for alleged offenders, freedom for prosecutors to settle bribery cases does not appear to signify an easy way out of the law enforcement situation. Jurisdictions that use settlements will often experience a lower extent of corruption and higher trust in their court systems. Settlement-friendly jurisdictions are not associated with a lower budget for law enforcement, even if the use of settlements tends to reduce enforcement expenses per case. While there are few clear trends with respect to governance, strict constraints on the prosecutor are associated with undemocratic (authoritarian) regimes. More democracy means more freedoms for the prosecutor, yet several of the jurisdictions most associated with criminal justice values, legitimacy and democracy have introduced new principles that constrain prosecutors' freedoms when they offer settlements.

5.2 Article 2: Settlements in Corporate Bribery Cases: The Illusion of Choice?

This article, co-authored with Tina Søreide, departs from a theoretical model developed by Reinganum (1988), where we combine an interpretation and modification of the theoretical model as a foundation for a legal review of the United States and the United Kingdom. The benchmark model is a signalling model of plea bargaining with asymmetric information, where two different law enforcement models are described and analysed. The difference is the degree of discretion awarded to the prosecutor, and how that affects the defendant's willingness to accept a settlement offer. A theoretical framework helps us to simplify a complex situation where there are certain aspects that we are especially interested in. Theoretical models rely on assumptions about the behaviour of the subjects studied, which enable us to extract insights about trade-offs in situations where assumptions can be adjusted as part of an analysis.

The original model from Reinganum (1988) focuses on the defendant as an individual, and considers the implications of crime in a more traditional sense. In our version of the model, we consider the case of when the defendant being is a big corporation, and that the crime committed is a complex corporate bribery case. We introduce the additional cost of collateral consequences in the situation where the defendant is found guilty in court. We use the model to analyse the difference between the expected outcome in a court case, and the certain sanction of accepting a settlement, which we label the *sanction gap*. The theoretical model helps us understand how different types of defendants will act depending on the size of the sanction gap, and what factors influence the size of the sanction gap.

Next, we conduct an analysis of the current legal situation in the United States and the United Kingdom. We choose these two countries because they are the two biggest enforcers of corporate bribery cases (TRACE, 2019). These countries are also two countries that conclude corporate bribery cases by the use of settlements. Legal analysis is a qualitative analysis of the legal framework at a given point in time. Such analysis provides insights into the written law of a jurisdiction, and how these laws turn out in practice. Considering results in view of the theoretical results, we are able to assess aspects that increase or decrease the sanction gap in the United States and the United Kingdom.

We address both the potential benefits and the possible drawbacks of settlement as an enforcement mode. We explain why the enforcement mode (i.e. settlements) may determine the defendant's behaviour and why such risks must be considered in law enforcement reform aimed at allowing both regular court cases and the use of settlements. We argue for a smaller difference between the expected penalties in the two alternative enforcement modes, as this will give a defendant a real option of declining a settlement offer in cases of serious doubt (and possible innocence). A small sanction gap increases the incentive for the prosecutor to conduct a thorough investigation as incentives are closer to the case of a court proceeding.

Settlements can be a tool to achieve better deterrence, given proper regulations, which up until now have been largely absent in most countries. With this article, we add nuance to the need for regulations, right at a time when the OECD produced new recommendations for countries.[3] These recommendations are soft law until implemented at the country level, and governments may choose to implement them in very different ways. We expect that there will be a debate, especially in European countries, on the various benefits and risks attached to settlement as an enforcement mode under criminal law.

5.3 Article 3: "Impartiality, integrity, efficiency": An Evidence-based Evaluation of the Record of Romania's Anti-corruption Directorate

The third paper, co-authored with Mihaly Fazekas and Agnes Batory, aims at creating a relationship between corruption cases brought by the Romanian anti-corruption agency (DNA) and the risk of corruption in public procurement cases. Different from the two previous papers is that this paper is more focused on one prosecuting authority in one jurisdiction, and we assess the work of the prosecutor empirically. In this paper we measure the risk of corruption using objective measures of red flags in public procurement. This is in an effort to try to overcome the inherent problem of corruption research, which is the objectivity of the measures of corruption. The studied red flags of corruption in public procurement are studied separately and included in a Corruption Risk Indicator (CRI) based on the work of Fazekas & Kocsis (2020). We argue that the CRI reflects exposure to corruption risk for a given public

[3]See: Recommendation of the Council for Further Combating Bribery of Foreign Public Officials in International Business Transactions (OECD/LEGAL/0378)

procurement contract. In addition, we study four key components of the CRI; non-open procedures, short bid submission time, no public tender call, and single bid contracts. While there are perfectly legitimate reasons for why these red flags can occur, we argue that a change in the behaviour of the procurement after a corruption case, where the procurement officer uses more or less public tenders containing red flags, is a proxy for the risk of corruption in public procurement. We argue that on an aggregated level, these red flags can serve as an objective proxy for corruption risk. Several other authors, such as Golden & Picci (2005); Auriol et al. (2016); Hyytinen et al. (2018) and Fazekas et al. (2016), have used a similar approach which highlights the distinction between objective proxy measures of corruption risk, and subjective perception based measures of corruption risk.

We conduct an empirical analysis in different steps to identify the causal relationship between the corruption case and the risk of corruption in public procurement. Initially, we compare the before and after mean of different dependant variables by a simple t-test. The next step is to run fixed effects regressions to isolate the effect from a set of independent variables, while controlling for fixed effects. The date of the indictment is used to create the treatment dummy and takes the value of 0 before the corruption case, and 1 after. A shift in the dependant variables can stem from either a change in demand of goods procured or in the behaviour of procuring the same goods.

To isolate the effect from a change in behaviour on corruption risk, which is what we are really interested in, we match contracts before and after treatment using coarsened exact matching developed by Iacus et al. (2011). Contracts are matched based on several factors to enable us to compare similar contracts before and after treatment. When we compare similar contracts we can isolate the possible shift in behaviour, as we now control for a shift in demand. Using a matching estimator, we show that a corruption case leads to a 2.8% overall decrease in corruption risk of new public tenders and reduces the use of tender calls that are not published online by 8.8%. The use of short submission periods does however increase after a corruption case by 2.7% and the use of single bid contracts increases by 1.4%. Our results show that a corruption case brought by the DNA reduces the corruption risk in public procurement locally. However, the increase in short submission periods and single bid contracts might suggest that the reduction in corruption risk is in large related to better formal compliance with procurement procedures, while the use of high-risk tender procedures remains a significant challenge to reducing corruption in public procurement.

6 Conclusion

Our contribution has been to systematically map the prosecutor's degree of discretion in settlements for corporate bribery cases. We evaluate the variations between the traditional court resolution and settlements. And we empirically assess the effect of the prosecutor in a case study of Romania. This contribution comes at a time when the OECD recently published guidelines on the use of settlements, and we expect development in policy related to the use of settlements. We contribute to strengthening the emphasis on a two-track enforcement regime in line with Rui & Søreide (2019), where anti-corruption is both forward-looking with the aim of preventing crime through an administrative legal track, and the backward-looking criminal law function of investigating and sanctioning corrupt actions that have already been committed. We hope that future research can continue to assess the law enforcement system, with a nuanced evaluation of the defendant, the prosecutor and the required trust in the institutions necessary to further improve crime deterrence, and a push for a more fair and equal society worldwide.

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Article 1

Prosecutors' Discretionary Authority in Efficient Law Enforcement Systems

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WORKING PAPER

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PROSECUTORS' DISCRETIONARY AUTHORITY IN EFFICIENT LAW ENFORCEMENT SYSTEMS

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Abstract: Prosecutors cannot end corporate bribery cases with a negotiated settlement unless they have the discretionary authority to do so, and this authority varies across countries. For this chapter, we developed a measure of prosecutorial discretion that allows for cross-country comparison, and used this measure to study relationships between the freedoms granted to the prosecutor and countries' notions of criminal law efficiency, as well as their political and economic context. For alleged offenders, freedom for prosecutors to settle bribery cases does not appear to signify an easy way out of the law enforcement situation. Jurisdictions that use settlements will often experience a lower extent of corruption and higher trust in their court systems. Settlement-friendly jurisdictions are not associated with lower budget for law enforcement, even if the use of settlements tend to reduce enforcement expenses per case. While there are few clear trends with respect to governance, strict constraints on the prosecutor are associated with undemocratic (authoritarian) regimes. More democracy means more freedoms for the prosecutor, yet several of the jurisdictions most associated with criminal justice values, legitimacy and democracy have introduced new principles that constrain prosecutors' freedoms when they offer settlements.

Contents

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1. Introduction

A glance at the geographic map of corporate liability enforcement practices quickly reveals substantial variation in enforcement activity.[2] A deeper look at underlying regulations also exposes differences when it comes to the values attached to enforcement activities and to the countries' criminal justice systems more generally. For example, in the United States, the jurisdiction with the highest number of corporate liability cases, deterring crime appears to be the only aim; even though the US criminal justice system developed mainly from adversarial concerns, with conflict resolution as its core purpose. In Germany, where the system's ability to deter crime is not at all taken for granted, it is considered equally important to assign culpability correctly, and as part of that, to determine the truth of the case.[3] In some other countries, such as the Nordics, additional aspects beyond moral guidance are added weight. For example, individuals' autonomy is a central criminal justice ambition,[4] and this implies strong safeguards against unfair treatment. In these countries, at least formally, plea bargain is not an option, given the high risk of self-incrimination.

Individual criminal responsibility is more important in some societies than in others. Some countries have refused to introduce corporate liability into their criminal law, although most countries make it possible to sanction firms for bribery.[5] The greater the emphasis on personal liability, the fewer regulations there seem to be for the enforcement of corporate liability, including the use of non-trial resolutions. Across Central Europe and Latin America in particular, we see broad variation in the ways in which enforcement systems pragmatically – and sometimes with significant resistance – put corporate liability into practice. This pragmatism is clearly expressed in the largely unregulated yet creative use of non-trial resolutions.

A recent International Bar Association (IBA) survey of settlement regulations and practices in 66 countries[6] confirms that settlements happen in corporate liability cases with increasing frequency in all regions. The survey report concludes by calling for more principled and harmonized regulations. However, what those principles should be is not clear.[7] Countries with different regulatory space for settlements operate under different judicial paradigms. As noted above, they emphasize different values and have different historical reasons for their choices, and their scholars defend judicial legitimacy and efficiency in different ways.

In this chapter we explore how these variations are reflected in the discretionary authority of prosecutors, by studying their opportunity to settle corporate bribery cases at the pre-trial stage. Based on the results of the IBA survey of settlement regulations, we develop an index in order to systematically measure and understand patterns of prosecutorial discretion around the globe, and to learn how these patterns are associated with different government systems. Finally, inspired by economic reasoning, we discuss efficiency trade-offs associated with different criminal justice paradigms.

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[2] TRACE, *International Global Enforcement Report 2017* (2018), https://traceinternational.org/Uploads/PublicationFiles/GER2017.pdf

[3] SHAWN MARIE BOYNE, COMPARATIVE CRIMINAL PROCEDURE 219-257 (Jacqueline E. Ross and Stephen C. Thaman ed., Edward Elgar Publishing 2016)

[4] Jørn Jacobsen, *RT. Concepts of Criminal Law and Representative Reductions*, NORDISK TIDSSKRIFT FOR KRIMINALVIDENSKAB. 46-64 (2012)

[5] Radha Ivory and Mark Pieth, *Overview* in CORPORATE CRIMINAL LIABILITY: EMERGENCE, CONVERGENCE, AND RISK 3-60 (Radha Ivory and Mark Pieth eds, Springer Publishing 2011).

[6] Abiola Makinwa and Tina Søreide, *Structured Criminal Settlements: Towards Global Standards in Structured Criminal Settlements for Corruption Offences* (The International Bar Association (IBA), Anti-Corruption Committee, Structured Criminal Settlements Sub-Committee 2018)

[7] According to their 2019 Agenda, the OECD Working Group on Bribery will address the need for recommendations for non-trial resolutions. A group of experts have developed draft guidelines to be considered in the process (The Recommendation 6 Network: https://www.nhh.no/en/research-centres/corporate-compliance-and-enforcement/guidelines-for-non-trial-resolutions/, 4 May 2019)

2. Efficiency concepts in a criminal justice context[8]

How to define *efficiency* in a criminal justice context is far from straightforward. The word pertains to the way resources are used to achieve objectives. However, while all criminal justice systems are developed for the broad purpose of controlling crime, they assign varying weight to different specific aims, especially crime deterrence, fair process, and value for money, but also sub-goals, such as the law's expressivist function and the system's effort to rehabilitate offenders. The different aims require different policies. At the same time, achieving efficiency with respect to just one of the criminal justice values is not enough to qualify a criminal justice system as 'well-performing'.

2.1 Crime deterrence, fair process and value for money

Crime deterrence may appear to be the most obvious aim, especially to economists, who assume that rational individuals will not commit crime if law enforcers ensure negative net gain for those involved. Firms will operate effective compliance systems if the benefits of doing so outweigh the risks associated with an enforcement action.[9] This argument is intuitively correct for most profit-motivated crime. The problem is on the practical side: how to ensure a negative net gain. The expected gains from corporate bribery may go far beyond the sanctions that wrongdoers can expect if they are caught in the crime. Moreover, corporate bribery typically is well hidden behind financial secrecy providers and corporate structures, which means a very low probability of detection. The lower this probability, the higher the total penalty must be to effectively deter the crime. As a rule of thumb in economics, the penalty must be set equal to the gain from bribery, divided by the probability of detection, if it is to have a decisive deterrent impact on rational profit maximizers.[10] By this rule, for example, deterring crime with a potential $10 million gain and 10 percent probability of detection would require a $100 million penalty. Some firms that use bribery to secure market entry and a strong market position may reap profits in the billions. If so, it will often be impossible for prosecutors to impose a fine that is sufficiently large, according to economic theory, to deter such crime. Politically, there is little willingness to impose such drastic sanctions because higher penalties mean greater risk of harm to innocent people, such as uninformed investors, customers, and employees, who are often unaware of the bribery; moreover, policy makers usually do not want to drive important producers and employers out of business. Reduced sanctions for those who self-police – by operating proper systems for risk prevention and oversight of business practice, and who self-report incidents that nevertheless occur – motivate compliance.[11] However, if decision-makers are rational profit-maximizers, such discounted penalties cannot be expected to deter the most serious forms of corruption unless the benchmark sanction is sufficiently high or the responsible individuals perceive a risk of imprisonment

[8] Arguments in this section are also presented in TINA SØREIDE, CORRUPTION AND CRIMINAL JUSTICE: BRIDGING ECONOMIC AND LEGAL PERSPECTIVES, Chapter 2 . Edward Elgar Publishing (2016.)

[9] In his seminal work, Becker argues that a rational player is deterred from committing a crime if the sanction equals the harm to society multiplied by the probability of being caught. GARY BECKER, CRIME AND PUNISHMENT: AN ECONOMIC APPROACH, 13-68 Palgrave Macmillan (1968). Rose-Ackerman established an economic analysis of corruption and explained why sanctions must be proportional to the offender's gain from the crime, and not, for example, to the harm to society. Susan Rose-Ackerman, *The economics of corruption,* JOURNAL OF PUBLIC ECONOMICS 4, 187-203 (1975). From these works the literature developed further, with contributions on negotiated settlements. William Landes, *An Economic Analysis of the Courts*, 14 JOURNAL OF LAW AND ECONOMICS 61-107 (1971), identified factors that players evaluate when choosing a settlement deal or a court case. RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW, Little Brown and Company (1973), and Steven Shavell, *Suit, settlement, and trial: A theoretical analysis under alternative methods for the allocation of legal costs,* 11,1 THE JOURNAL OF LEGAL STUDIES 55-81 (1982), were among the first to study cross-country variations in settlements, comparing the United States and the United Kingdom.

[10] Susan Rose-Ackerman. *The Economics of Corruption*. 4(2) JOURNAL OF PUBLIC ECONOMICS, 187-203. (1975).

[11] Jennifer Arlen, *Corporate Criminal Liability: Theory and Evidence* in, RESEARCH HANDBOOK ON THE ECONOMICS OF CRIMINAL LAW, (Alon Harel and Keith N. Hylton, Eds) Edward Elgar Publishing (2012). SHARON ODED, CORPORATE COMPLIANCE. Edward Elgar Publishing (2013).

The impact of enforcement actions will depend on how individuals, who allow or condone the corporations' harmful acts, can be held responsible. The economic intuition about crime deterrence leads to a different result if the net gain from crime also depends on these decision-makers' moral burden, or moral cost. Ethically conscious decision-makers are less inclined to commit crime, regardless of the size of expected fines, for the same reason that most people will not steal an unprotected wallet: they *are not* people who steal. This moral position may evolve independently of the size of penalties, depending instead on a range of other factors, including the governance situation and the respect and trust accorded the criminal justice system in society.

This is why legitimacy is another essential criminal justice value. An enforcement system that ignores the principles of fair process will not generate the trust it requires to function as a catalyst for moral development. Why should citizens respect a criminal justice system and the laws it defends if those in charge enforce the law arbitrarily, protect and favour the privileged, fail to find the facts of a case before they condemn an offender, and ignore human rights? On the contrary, a system that enforces laws enacted through a democratic process, protects the autonomy of the individual – so that it is considered worse to punish an innocent person than to let a guilty person go free – and aims to find the truth of a case for the sake of signalling moral judgment is more likely to be heeded. Corporations consist of multiple powerful players. If some of them are pure profit maximizers whose crime is not deterred by the risk of penalties, serious corporate crime might yet be prevented if others refuse to be involved in actions deemed wrong by a trusted criminal justice system. Could a legitimate system that encourages crime prevention be found efficient irrespective of the total burden of sanctions?

It would depend on cost-efficiency as well, and this is the third essential aim. A system able to attach a certain moral burden to crime may achieve its objectives at a lower cost than a system built on the cat-and-mouse approach combined with high penalties and long prison terms. For a government, however, this option depends on its standing in society. It cannot expect to have the necessary moral authority if political leaders themselves are considered corrupt, if the government tries to silence critical journalists, if law enforcers torture prisoners until they confess, and if laws are passed without due democratic process. Therefore, the function and impact of the criminal justice system is hard to isolate from the performance of government overall.

2.2 Efficiency trade-offs

How governments balance the values associated with criminal law comes to expression in their enforcement of corporate liability. The following efficiency trade-offs are particularly relevant to the enforcement of corporate bribery laws.

i) *Trust-based for detection or threat-based for deterrence.* A tough, uncompromising system with strict controls may have what it takes to be trusted as a law enforcer against serious crime. As sanctions become more severe and threatening, deterrence is enhanced, but it becomes more difficult to ensure cooperation between firms and investigators for the sake of efficient law enforcement. The higher the expected penalty, the more inclined the offender is to hide the crime, instead of self-reporting its involvement in bribery.

ii) *Enforcement action based on guilt or responsibility.* Vicarious liability for corporations encourages corporate self-policing if involvement in crime, once detected, automatically leads to undesired consequences. At the same time, undesired consequences for innocent actors are likely to be seen as unfair. The more unfair the consequences of enforcement actions, the weaker the criminal justice system's moral authority. However, the more important to determine the extent of negligence, the more expensive the enforcement action.

iii) *Flexibility or predictability.* When there are few limits on the prosecutor's authority, this implies broad discretion and an opportunity to tailor an enforcement action to the specific context, combining the sanction with integrity systems and monitoring. However, the more

> flexible the enforcement system, the harder it is to secure law enforcement predictability. Different enforcement solutions to what appear to be similar cases may reduce citizens' trust in the system and in its ability to secure legal egalitarianism.

There is no single truth regarding optimal enforcement of corporate bribery legislation. Different societies will consider these trade-offs differently. The definition of an efficient or principled criminal law approach in corporate liability cases may depend on contextual factors, history, culture, and the magnitude of crime problems. Empirical investigations of countries' *de facto* efficiency standards are complicated. Governments have strategic priorities, but they rarely assign an explicit ranking to the fundamental values of their law enforcement system.[12] Instead, they tend to proclaim efficiency, justice, and value for money as if these aims were equally important. Moreover, criminal justice systems are given the ultimate responsibility for crime control, yet corruption and other sorts of crime occur for reasons outside the control of these systems, and so an increase or decrease in the extent of corruption cannot be attributed to the criminal justice system alone. Indeed, there are no accurate estimates of the extent of the problem. Corruption normally happens in secret. For researchers it is nearly impossible to determine a law enforcement system's impact on society, and therefore it is difficult to estimate its efficiency.

To better understand what constitutes good enforcement of corporate liability, we have explored what the IBA survey results can tell us about different governments' priorities regarding the efficiency of their criminal justice systems.

3. Expressions of efficiency priorities in the IBA survey results

The IBA survey presents information about corporate liability and enforcement practices across 66 countries; it was not developed for a study of the efficiency trade-offs discussed above.[13] However, the results do contain information about such aspects as the formal and actual sphere of enforcement, law enforcement's required transparency, and the degree of judicial oversight imposed on the law enforcement process. How can these findings inform us about efficiency in the enforcement of corporate liability?

3.1 Prosecutors' discretionary authority to settle bribery cases

A study of settlements in a broader criminal law context quickly leads to the role of prosecutors. When criminal cases are concluded out of court, the prosecutor's role and her level of discretionary authority become more important to the result. Generally, "a public officer has discretion whenever the effective limits on his power leave him free to make a choice among possible courses of action or inaction".[14] The level of discretion granted to a prosecutor is determined by the explicit procedural laws (*de jure* discretion) and less-formal norms and guidelines (*de facto* discretion) available in the jurisdiction. If plea bargain[15] is permitted, the degree of discretionary authority will determine the prosecutor's ability

[12] Even in countries with an independent criminal justice system, the government shapes policies and priorities through explicit policy instructions, budget allocations, and laws approved by parliament.

[13] All respondents except two were lawyers from private law firms associated with the International Bar Association. The other two respondents were lawyers working for a public institution. Makinwa and Søreide s*upra* note 6, provide the list of respondents and the firms/institutions they represent. The report is available online free of charge.

[14] Kenneth C. Davis, *Discretionary justice: A preliminary inquiry. LSU PRESS 4 (1969)*

[15] "Plea bargaining occurs when the prosecutor induces a criminal accused to confess guilt and to waive his right to trial in exchange for a more lenient criminal sanction than would be imposed if the accused were adjudicated guilty following trial. The prosecutor offers leniency either directly, in the form of a charge reduction, or indirectly, through the connivance of the judge, in the form of a recommendation for reduced sentence that the judge will follow. In exchange for procuring this leniency for the accused, the prosecutor is relieved of the need to prove the accused's guilt, and the court is spared having to adjudicate it. The court condemns the accused on the basis of his confession, without independent adjudication." John H. Langbein, *Torture and plea bargaining.* 46.1 THE UNIVERSITY OF CHICAGO LAW REVIEW 8 (1978)

to dictate the terms of this agreement. The prosecutor makes decisions that affect both the pre-trial and trial outcomes, and is usually the one who proposes the sanction that ends the case if accepted by the defendant. In addition, under *prosecutorial sentencing*, some jurisdictions grant prosecutors the right to impose criminal sanctions, giving them an authority formerly granted only to judges. This judge-like role also occurs when the prosecutor offers and agrees to a bargained settlement, because the prosecutor concludes processes that are otherwise associated with court judgment.[16]

The set of rules that determine the prosecutor's discretionary authority reflects priorities within criminal justice systems. Imposing more limits on what the prosecutor can do may secure more consistency across cases, but it becomes more difficult to tailor the enforcement process and outcomes to the circumstances. From an economic perspective, one would consider the likely threshold that an actor (an individual or firm) has for committing a crime. A rigid system will require the prosecutor to propose the same sanction for similar crimes, while a less rigid system enables the prosecutor to propose different sanctions for similar crimes.[17] Generally speaking, a rigid system will deter every actor who has a threshold for committing a crime that is lower than the proposed sanction, while actors with a threshold higher than the sanction will still commit the crime. In theory, a less rigid system allows the prosecutor to tailor a sanction to the actor's unique threshold level; this means that actors are more efficiently deterred at a minimum sanction, and therefore at a lower cost to society. Whether an actor's threshold is higher or lower than the expected sanction is influenced, for example, by rules that require the actor to admit guilt. Admission of guilt will prevent a settlement outcome in cases where the actor has reason to fear that such admission may lead to compensation claims, debarment from public procurement, reputational costs, and collateral damage that in total constitute a burden that surpasses the actor's personal threshold. Strict judicial review of the settlement outcome will limit the prosecutor's freedom because the result needs to be approved by a second level. However, both a system with wide discretion and a system with rigid rules for the prosecutor can be compatible with incentives for corporate self-policing and self-reporting; it depends on the content of those rigid rules and the circumstances for autonomous prosecutors. This is why the question of which system provides the greatest efficiency remains unanswered.

3.2 A Prosecutor Discretion Index

The IBA survey asked respondents in 66 jurisdictions about the rules regulating use of settlements in corporate bribery cases, focusing on their degree of rigidity or laxness. Based on their responses, we have developed an index to estimate the extent of discretion each country grants its prosecutors.[18] The Prosecutor Discretion Index is based on survey questions that specifically address aspects of prosecutor authority, eliciting both qualitative and quantitative replies.[19] Each country receives scores on five sub-variables: the prosecutor's opportunity to drop the case, the *de jure* bargaining freedom, the *de facto* bargaining freedom, the number of items subject to bargaining, and ex post monitoring.[20] Responses are ranked on a scale from 0 to 5, where 0 is no discretion and 5 is full discretion. For example, if the respondent states that prosecutors have unfettered discretion in choosing which cases to drop, that jurisdiction gets a score of 5 on the sub-variable 'prosecutor's opportunity to skip the case'. The score would be 4 if the respondent replied that the prosecutor has wide discretion on which cases to drop but is bound by some vaguely defined criteria in this regard. These scores are then aggregated, with all five

[16] ERIK LUNA and MARIANNE WADE, THE PROSECUTOR IN TRANSNATIONAL PERSPECTIVE, Oxford University Press (2012)

[17] For an explanation of how these differences influence law enforcement, see Jennifer F. Reinganum, *Plea bargaining and prosecutorial discretion*, THE AMERICAN ECONOMIC REVIEW, 713-728 (1988)

[18] Makinwa and Søreide, s*upra* note 6.

[19] See the Appendix for survey questions included in the Discretion Index and which questions the constribute to the different subvariables.

[20] The IBA survey questions include such aspects as prosecutor institutional independence and whether the jurisdiction abide by the legality principle or opportunity principle – and these aspects are captured in some of the variables included in the index, although these factors are not listed as independent variables.

sub-variables weighted equally. The survey also maps the transparency of negotiated settlements, but this factor is not included in the index. All answers were fact-checked to make sure that the legal references to which a respondent refers correspond with the respondent's answer on the specific question.

Based on the aggregate scores, the Discretion Index gives an overall picture of how countries differ in prosecutorial discretion, as shown in Table 1. For example, France, Croatia, Serbia, Montenegro, and the United States grant their prosecutors a high degree of discretion, while Egypt, Brazil, the United Kingdom, Azerbaijan, and Denmark are more conservative in this regard. Certain caveats should be kept in mind. Each jurisdiction's scores on the sub-variables depend on the answers provided by a single respondent – one respondent per jurisdiction. This, of course, represents a weakness in the data, as different lawyers might perceive the situation differently, and this subjectivity must be taken into account when interpreting results. Moreover, the survey represents a snapshot of the situation at the moment it was conducted. Enforcement practices evolve rapidly in many countries, and some jurisdictions may have introduced new rules after the survey was conducted. For both reasons, the Discretion Index is only one indicator of the situation in each jurisdiction, and should be taken into account along with other indicators in drawing conclusions.

COUNTRY	**Prosecutor Discretionary Index**	Opportunity to skip the case	De jure bargaining freedoms	De facto bargaining freedoms	Ex post monitoring	*Transparency for the public*
France	4,25	5,0	5,0	5,0	2,0	*4,0*
Croatia	4,25	4,0	5,0	4,0	4,0	*1,0*
Montenegro	3,91	5,0	2,6	4,0	4,0	*1,0*
Serbia	3,91	5,0	2,6	4,0	4,0	*1,0*
United States	3,84	5,0	5,0	3,3	2,0	*4,0*
Bulgaria	3,84	4,0	4,0	3,3	4,0	*2,0*
Bosnia and Herzegovina	3,84	4,0	4,0	3,3	4,0	*1,0*
Ireland	3,84	4,0	4,0	3,3	4,0	*1,0*
Belgium	3,84	5,0	5,0	3,3	2,0	*1,0*
Israel	3,75	4,0	4,0	5,0	2,0	*5,0*
Singapore	3,66	4,0	2,6	4,0	4,0	*1,0*
Japan	3,59	4,0	3,0	3,3	4,0	*3,0*
Macedonia	3,59	5,0	2,0	3,3	4,0	*2,0*
Slovak Republic	3,50	3,0	3,0	4,0	4,0	*3,0*
Netherlands	3,50	4,0	4,0	4,0	2,0	*2,0*
Czech Republic	3,50	2,0	3,0	5,0	4,0	*1,0*
South Korea	3,50	4,0	2,6	3,3	4,0	*1,0*
Honduras	3,41	3,0	2,6	4,0	4,0	*1,0*
Finland	3,34	4,0	4,0	3,3	2,0	*4,0*
Paraguay	3,34	4,0	4,0	3,3	2,0	*4,0*
Ecuador	3,34	3,0	3,0	3,3	4,0	*3,0*
Chile	3,34	4,0	4,0	3,3	2,0	*3,0*
Lithuania	3,34	5,0	1,0	3,3	4,0	*2,0*
Taiwan	3,34	4,0	4,0	3,3	2,0	*2,0*
Luxembourg	3,34	5,0	3,0	3,3	2,0	*2,0*
Hungary	3,34	4,0	4,0	3,3	2,0	*1,0*
Slovenia	3,34	4,0	4,0	3,3	2,0	*1,0*
Nigeria	3,16	4,0	2,6	4,0	2,0	*3,0*
Romania	3,09	2,0	3,0	3,3	4,0	*3,0*
Poland	3,09	2,0	3,0	3,3	4,0	*2,0*
Austria	3,09	2,0	3,0	3,3	4,0	*1,0*
Albania	3,09	3,0	2,0	3,3	4,0	*1,0*
Russia	3,00	3,0	3,0	4,0	2,0	*2,0*

Bolivia	2,91	2,0	2,6	3,0	4,0	*2,0*
Costa Rica	2,84	2,0	2,0	3,3	4,0	*2,0*
Peru	2,84	2,0	2,0	3,3	4,0	*2,0*
Portugal	2,84	2,0	2,0	3,3	4,0	*2,0*
Ukraine	2,84	2,0	2,0	3,3	4,0	*2,0*
Argentina	2,84	3,0	3,0	3,3	2,0	*2,0*
Colombia	2,84	2,0	2,0	3,3	4,0	*1,0*
El Salvador	2,84	2,0	2,0	3,3	4,0	*1,0*
Indonesia	2,84	2,0	2,0	3,3	4,0	*1,0*
Uruguay	2,84	2,0	2,0	3,3	4,0	*1,0*
Malaysia	2,84	3,0	1,0	3,3	4,0	*1,0*
Nicaragua	2,84	3,0	1,0	3,3	4,0	*1,0*
Kazakhstan	2,75	2,0	3,0	4,0	2,0	*4,0*
Belarus	2,75	2,0	2,0	3,0	4,0	*3,0*
Switzerland	2,75	2,0	3,0	4,0	2,0	*3,0*
Norway	2,75	4,0	1,0	2,0	4,0	*2,0*
United Arab Emirates	2,75	4,0	2,6	3,3	1,0	*1,0*
Canada	2,66	2,0	2,6	4,0	2,0	*4,0*
Greece	2,50	1,0	2,0	3,0	4,0	*1,0*
Guatemala	2,41	1,0	2,6	2,0	4,0	*1,0*
Mexico	2,41	2,0	2,6	3,0	2,0	*1,0*
Italy	2,34	1,0	1,0	3,3	4,0	*2,0*
Turkey	2,34	1,0	1,0	3,3	4,0	*1,0*
Estonia	2,25	2,0	2,0	3,0	2,0	*4,0*
Latvia	2,25	2,0	2,0	3,0	2,0	*3,0*
Germany	2,25	1,0	1,0	3,0	4,0	*2,0*
Spain	2,25	2,0	2,0	3,0	2,0	*2,0*
Sweden	2,25	2,0	1,0	2,0	4,0	*1,0*
Azerbaijan	2,00	1,0	1,0	2,0	4,0	*3,0*
Denmark	2,00	1,0	1,0	2,0	4,0	*1,0*
England and Wales	1,75	1,0	1,0	3,0	2,0	*4,0*
Brazil	1,75	1,0	2,0	2,0	2,0	*3,0*
Egypt	1,50	2,0	1,0	2,0	1,0	*1,0*

Table 1: Degree of prosecutorial discretion with sub-variables based one the IBA-surveyed countries. Transparency is not included in the PDI.

For our study of enforcement systems, we chose to use a compilation of information about prosecutors' authority across jurisdictions instead of considering the individual sub-variables, which would make it clearer exactly what sort of authority we are addressing. We preferred the compilation to studies of the separate responses because we wanted to capture a broad sense of prosecutorial discretion. For this purpose, the variation in the narrower sub-indicators was too arbitrary. In section 4, we will discuss how the Discretion Index correlates with certain governance indicators.

4. Analysis of governance indicators and prosecutorial discretion

In line with our discussion in section 2 about the three main categories of criminal justice values, we now investigate how the level of prosecutorial discretion correlates with three variables: (a) the extent of corporate corruption in society; (b) the legitimacy of the government system, most meaningfully reflected in a well-functioning democracy and the rule of law; and (c) the budget for law enforcement relative to other budget categories, to establish whether more prosecutorial discretion is associated with larger or smaller budgets for law enforcement.

4.1 The relationship between prosecutorial discretion and the extent of business-related corruption

The World Bank Enterprise Survey collects data from some 135,000 respondents across 139 countries. Firms' self-reported experience with corruption is an indicator of the extent of such crime across

countries, and is highly relevant to our own study, which focuses on corporate practices and liability. Within the World Bank dataset, we selected three specific indicators of corruption: the percentage of firms that had encountered a bribery incident over the last 12 months; the percentage that considered corruption to be a major business constraint; and the percentage that found the courts to be a major business constraint. Comparing these data to the IBA survey data, we found no clear correlation between the extent of corruption reported by firms and the level of prosecutors' discretionary authority.

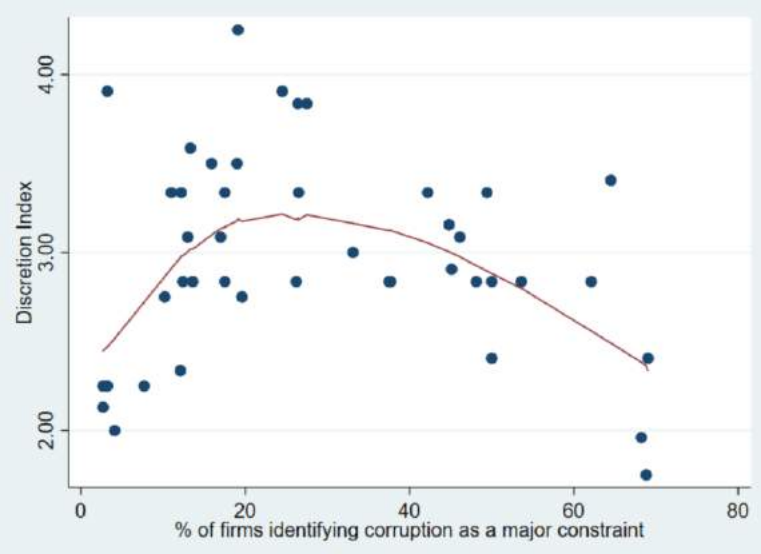

Figure 1: Discretion Index and the percentage of firms in different countries that consider corruption to be a major constraint on business with LOWESS curve.

As Figure 1 illustrates, there is no clear correlation between firms experiencing corruption as a major constraint and reported prosecutorial discretion. Based on this result, there is no reason to claim that a system with broad or narrow prosecutorial discretion is associated with less crime. A closer look at the data, however, reveals that among countries with a high score on the Discretion Index (>3.5), there are very few where corruption is described as a major constraint by over 30 per cent of firms. While providing no basis for claims about causality (as discussed in section 2), this result suggests that government systems that allow their prosecutors broad discretionary authority in corporate liability cases also manage to control corruption fairly well.

When it comes to confidence in courts, we find that countries where a low (<15%) percentage of firms consider courts to be a major constraint on business tend to allow their prosecutors broader discretionary authority (>2.5). Therefore, broader discretion granted to prosecutors appears to correlate with firms having fewer problems with the court system. This may reflect the fact that prosecutorial discretion implies a limit to the court's monopolistic authority. It could also mean that courts are perceived as less of an obstacle to business if cases can be solved with the prosecutor, without the involvement of a court, irrespective of the extent of corruption.

4.2 Connections between prosecutorial discretion and system legitimacy

As we study which countries grant their prosecutors broad discretionary authority, the most striking finding is that rigid rules for prosecutors tend to correlate with poor scores on indicators of governance legitimacy. We ranked countries included in the IBA survey using the Economist Intelligence Unit (EIU) Democracy Index of 2018.[21] Considering the relationship between democratic performance and prosecutors' discretion to settle cases out of court, we find that the least democratic countries limit their

[21] For details about the index see https://www.eiu.com/topic/democracy-index.

prosecutors' authority much more than countries that are more democratic.[22] Intuitively, governments with weaker democratic institutions may need a more rigid system to build confidence in state authority and to make sure their prosecutors act according to the government's goals.[23] Better democratic performance (between 2 and 6 on the Democracy Index) is associated with higher scores on the Discretion Index (see Figure 2). As countries develop politically, they grant their prosecutors more discretionary authority, it seems. One explanation might be that governments offer wide procedural discretion to prosecutors under circumstances where it is more important to be seen as a tough enforcer, while legitimate process comes second. One example could be Georgia after the post-Soviet Rose Revolution, when ample discretion was granted to prosecutors in an effort to curb widespread corruption.[24]

However, Figure 2 also shows a somewhat concave relationship between the variables: as countries develop even further in terms of democratic performance, scoring higher than 6 on the EIU Democracy Index, they tend to add restrictions on prosecutors' discretionary authority. One interpretation of this finding is that as societies develop politically, they establish rules that match their desired enforcement practices, and these new, more rigid rules secure enforcement decisions that other countries need a certain level of discretion to obtain. This is consistent with the current evolution regarding settlements: as more countries introduce such enforcement practices as a real, *de jure* alternative to court proceedings,[25] they want a system where rules secure both legitimacy and the right incentives for firms. In that respect, the curve in Figure 2 may indicate a prognosis, namely that with evolution toward democratic norms, we will see stricter systems for the use of non-trial resolutions – an approach also promoted by the Organisation for Economic Co-operation and Development (OECD) Working Group on Bribery.[26] (This possible prognosis is supported by a similar relationship between discretionary authority and rule of law; see the Appendix, part 7.5.)

[22] Anne Van Aaken, Lars P. Feld, and Stefan Voigt, *Do Independent Prosecutors Deter Political Corruption? An Empirical Eevaluation Across Seventy-eight Countries.* 12(1) AMERICAN LAW AND ECONOMICS REVIEW, 204-244 (2010).

[23] Less democratic countries tend to have more corruption problems. However, a rigid enforcement system does not necessarily imply more opportunity for (corrupt) politicians to interfere in enforcement practices.

[24] Lilli di Puppo, *Police reform in Georgia. Cracks in an Anti-corruption Success Story*, 2 U4 PRACTICE INSIGHT (2010)

[25] Abiola Makinwa, Chapter in *Negotiated Settlements in Bribery Cases: A Principled Approach*, (Forthcoming)

[26] See International Guidelines for Non-trial resolutions of Foreign Bribery Cases (Oct. 31, 2018) https://www.nhh.no/en/research-centres/corporate-compliance-and-enforcement/guidelines-for-non-trial-resolutions/

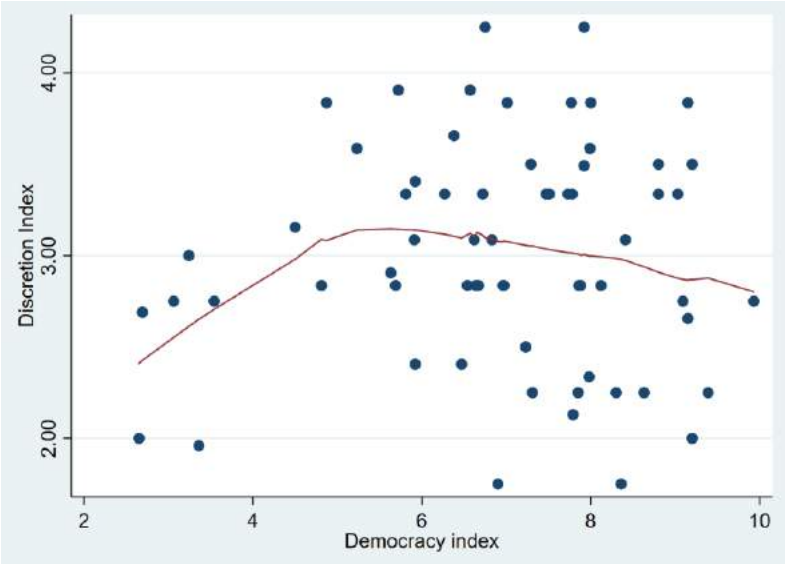

Figure 2: Discretion Index vs. Democracy Index with LOWESS curve.

The IBA survey results provide too weak a basis for any firm conclusions in this respect. In fact, as scores rise on the Democracy Index, scores on the Discretion Index become more widely scattered, indicating a greater spread in countries' levels of prosecutorial discretion. The United States, for example, chooses to grant its prosecutors broad discretion. The main reason it receives a high score on the Discretion Index is the absence of regulations regarding what prosecutors can offer as components of sanctions in negotiated settlements.[27] While the United States is not among the top scorers in terms of democratic performance, it is highly trusted internationally as a law enforcer in corporate liability cases. In general, the US prosecutor is expected to fulfil the goals set by society without strict supervision, although there are academic debates about the risks associated with such vast discretion. [28] The United Kingdom, another common law country, falls at the opposite end of the Discretion Index from the United States, despite a similar level of democratic performance. Compared to the US, the UK is far more restrictive in giving its prosecutors discretionary authority for non-trial enforcement outcomes. This might reflect greater political emphasis on consistency across cases – and by extension, on equality before the law – for the sake of securing the public's trust in the system, as discretion granted to individual prosecutors is easily associated with a less unified enforcement system.

What are the implications for law enforcement efficiency? Discretionary authority might be particularly useful under circumstances where it is difficult to tell which rules would provide the right incentives to corporations to comply with the law and self-report incidents when they happen.[29] As this becomes clearer for regulators, more regulations might be warranted for the sake of legitimacy. In many settings, restricted discretionary authority is considered a pillar of integrity because the system's performance becomes less dependent on the personal integrity of individuals. That means some rigidity regarding prosecutors' freedom with respect to non-trial resolutions is associated with lower risk of favouritism and other forms of biased decision-making.

[27] See guidelines for FCPA enforcement. The guide refers mainly to the process up until sentencing. The sentencing and resolution part leaves the prosecutor with wide discretion. See https://www.justice.gov/sites/default/files/criminal-fraud/legacy/2015/01/16/guide.pdf

[28] Jennifer Arlen and Marcel Kahan, *Corporate Governance Regulation through Nonprosecution*, 84 U. CHI. L. REV. 323-387 (2017).

[29] Arlen, s*upra* note 11.

4.3 Connections between prosecutorial discretion and budget for law enforcement

Across countries, there is variation in the political will to allocate budget for law enforcement, meaning the police and court systems.[30] While settlements allow for 'smart sanctions' – those that push firms onto the preventive track, instead of into a cat-and-mouse game with investigators – some governments may also see settlements as an opportunity to cut expenses for the enforcement of corporate criminal liability. To what extent do small budgets for enforcement imply settlement-friendliness?

Less democratic countries spend more money on law enforcement, relative to other budget categories, than do more democratic countries.[31] As a percentage of gross domestic product (GDP), governments' budgets for law enforcement are higher the less democratic they are, as illustrated in Figure 3. Given that crime rates are typically lower in more democratic societies, which tend to spend less, it is tempting to claim that these countries have more efficient law enforcement systems that keep crime rates low at less financial expense to society.

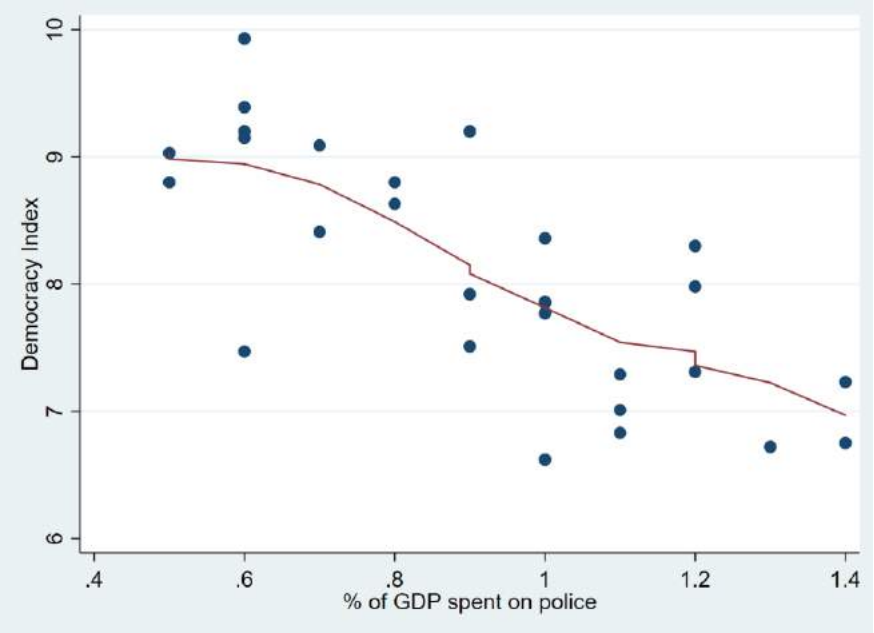

Figure 3: Democracy Index vs. percentage of GDP spent on police with LOWESS curve.

However, we need to look more carefully at the data. Most notably, if we consider countries' law enforcement budgets *per capita*, rather than as a share of GDP, we find that the most democratic countries spend more on law enforcement than less democratic societies. The results are largely driven by the Nordic countries – rich, democratic polities with small populations. Norway, Denmark, and Sweden spend approximately 0.2 to 0.3 per cent of their GDP on court systems, and 0.6 per cent on police forces. These figures may appear low, but on a per capita basis, the expenditures in these countries are actually much higher than in most undemocratic countries, which are often poorer. On the other hand, the high wage level in the Nordic countries implies that most of this additional spending goes to salaries, and thus the effective amount of resources for law enforcement may be similar to what is found in countries with lower expenses.

[30] An example of how shortcomings may be pronounced is *De Cubber v. Belgium* (9186/80), ECHR section 34–35 where Belgium is criticized for not allocating sufficient funds to its courts. For a review of problems with law enforcement in bribery cases, see TINA SØREIDE, CORRUPTION AND CRIMINAL JUSTICE: BRIDGING ECONOMIC AND LEGAL PERSPECTIVES, 76-115. Edward Elgar (2016)

[31] The data is are limited to the EU-28 28 European Union countries plus Norway, Iceland, and Switzerland. See Eurostat, Government expenditure on public order and safety (2016), https://ec.europa.eu/eurostat/statistics-explained/index.php/Government_expenditure_on_public_order_and_safety

5. What extent of prosecutorial discretion seems right for different groups of countries?

Our study of prosecutorial discretion across the 66 countries included in the IBA survey shows how countries that manage to control corruption vary in the degree of discretion they grant their prosecutors. We also see that in countries where prosecutors have the flexibility they need to settle cases out of court, firms tend to regard the court system as less of an obstacle to business. We find the most rigid rules for prosecutors in countries with weak democratic systems. With political development, prosecutors obtain more discretionary authority; countries with reformist governments may even let prosecutors' freedom go too far, at the expense of due process, in an effort to create an environment less tolerant of corruption. We mentioned Georgia as one example.

The most democratic countries are now inclined to introduce stricter regulations for prosecutors, including constraints on their freedom to determine the content of negotiated settlements in corporate bribery cases. The rigidity associated with this category of countries is different from the restrictions imposed in the least democratic countries, especially insofar as the difference between *de jure* and *de facto* discretion is smaller for the more democratic countries. In particular, countries that are more democratic are in general more transparent, which limits the prosecutor's freedom. Governments in the most democratic countries have started to consider limits on prosecutorial authority in non-trial circumstances as a condition for system legitimacy. Several countries that rate high on the EIU Democracy Index were the first to introduce rules for non-trial resolutions, including the United Kingdom, Canada, Spain, and Switzerland, while Norway and Australia, among others, are currently considering adoption of clearer regulations.

It is tempting to interpret the broader discretion for prosecutors in the United States as a reflection of its relatively weak democratic system (the EIU index categorizes the United States as among 'flawed democracies'). This could explain why politicians might have granted prosecutors wide discretion to achieve efficient law enforcement. However, given the United States' impressive track record in corporate liability cases – as a frontrunner with more enforcement cases against foreign bribery than all other countries combined, and as a regulator for market integrity more generally – this interpretation is inadequate. In addition, other countries that have introduced or are about to introduce clearer regulations for settlements cannot claim to have flawless enforcement systems.

In the United Kingdom, for example, prosecutors offer settlements under strict regulations (the UK score on the Discretion Index is a low 1.75), while the country scores very well when it comes to both democracy and the rule of law. While this might seem like an ideal situation, given the arguments above, the UK enforcement system is heavily criticized for its management of recent corporate bribery cases. These include the cases against TESCO[32] and Rolls Royce, both of which received fairly low sanctions.[33] Although the firms in both cases accepted the facts of their case, no individual received criminal sanctions. The outcomes did little to secure public confidence in the enforcement system's ability to prevent crime or to treat individuals equally before the law.[34]

Sweden, another top democracy with a highly trusted government, has an enforcement regime with restricted discretion for prosecutors, but it still has few if any regulations governing non-trial resolutions. The system faced criticism recently due to its management of the Telia case, in which a Swedish telecommunications firm agreed to pay nearly $1 billion in a settlement with US prosecutors because it had paid bribes to the daughter of the Uzbek president in order to obtain mobile phone licenses in

[32] See Zoe Wood and Sarah Butler, Two Tesco directors cleared of fraud as judge labels case 'weak' (Dec. 6, 2018), https://www.theguardian.com/business/2018/dec/06/two-tesco-directors-cleared-of-false-accounting.

[33] Serious Fraud Office (SFO), Rolls-Royce PLC (Feb. 22, 2019) https://www.sfo.gov.uk/2019/02/22/sfo-closes-glaxosmithkline-investigation-and-investigation-into-rolls-royce-individuals/ and https://www.sfo.gov.uk/cases/rolls-royce-plc/.

[34] The deferred prosecution agreement (DPA) with TESCO stated the names of the three managers (the guilty minds), as the UK Bribery Act requires at least one person in the firm to be the 'controlling mind and will'. The SFO charged the individuals, but they were all acquitted based on insufficient evidence.

Uzbekistan.[35] While the lines of responsibility appeared quite clear, the firm's executives were all acquitted in Sweden.[36] In Norway, the Norwegian chief executive of the subsidiary of a state-owned company could not be charged for bribery in a parallel case with a US-driven settlement resulting from bribery in Uzbekistan; instead, he claimed a record-high compensation for the burden of having been investigated unfairly. In Canada, the prime minister was criticized in spring 2019 for his attempt to shield a large firm in his home city from investigation and charge in a corporate bribery case.

These cases illustrate how the best-performing governments can have problems with the enforcement of corporate liability in bribery cases, despite their stellar legislation, checks on prosecutors, and well-trusted governance systems. Unless enforcement systems take action against responsible individuals, better procedures for corporate sanctions may be insufficient for a system to be found trustworthy and *efficient*. A legitimate system protects individuals from criminal law sanctions when there is no proof of criminal intent, but only of negligence. Nonetheless, in such cases it may be possible to impose non-criminal sanctions, such as debarment from certain positions or non-criminal fines.[37] Leaders who go free in serious bribery cases – and who may claim huge compensation if investigated because they had the line responsibility for the relevant business unit – provoke criticism among the public. A system for negotiated settlements in corporate bribery cases may well encourage compliance, risk assessment, and self-reporting, but it will not be deemed efficient unless justice is seen to happen.

6. Conclusion

This chapter explains why differences in prosecutorial discretion exist and how some of these differences are manifested. We find no clear international trend when it comes to the extent of discretionary authority granted to the prosecutor. Different countries belonging to different legal paradigms treat law enforcement differently, and this affects the prosecutor's position. However, the use of settlements in corporate bribery cases does not appear to be motivated by the opportunity to cut budget for law enforcement, even if settlements normally implies lower expenses per enforcement case. Instead, jurisdictions that grant their prosecutors broad freedom, are also among the ones with the highest budgets for law enforcement. Consistent with this result, prosecutors have more freedom to end cases with a settlement in countries where firms report fewer problems with corruption. Developing countries with less democratic institutions and weaker checks and balances in politics tend to have the most rigid rules for prosecutors and limited flexibility for negotiated settlements. As countries develop politically, their prosecutors obtain more freedom, which means that negotiated settlements become possible. Among the most democratic countries, however, the trend shifts again, and we observe a reduction in the gap between *de jure* and *de facto* discretion, indicating that law enforcement institutions enjoy less discretionary freedom to negotiate settlements with corporate offenders. On the basis of our analysis and given our three-dimensional concept of enforcement efficiency, a system that uses settlements in corporate bribery cases is no less *efficient* than a system that keeps to court proceedings. In light of the limited evidence currently available, more research is needed to draw clear conclusions regarding the optimal extent of prosecutorial discretion and its impact on the prevention of corruption and other sorts of crime.

[35] DOJ, Telia Company AB and Its Uzbek Subsidiary Enter Into a Global Foreign Bribery Resolution of More Than $965 Million for Corrupt Payments in Uzbekistan (Sept. 21, 2017) https://www.justice.gov/opa/pr/telia-company-ab-and-its-uzbek-subsidiary-enter-global-foreign-bribery-resolution-more-965.

[36] Olof Swahnberg and Helena Soderpalm, 2-Swedish court acquits former Telia CEO in Uzbekistan bribery probe (Feb. 15, 2019) https://www.reuters.com/article/telia-verdict/update-1-swedish-court-acquits-former-telia-ceo-in-uzbekistan-bribery-probe-idUSL5N20A2VF.

[37] For further explanation, see Jon Petter Rui and Tina Søreide. *Governments' Enforcement of Corporate Bribery Laws: A Call for a Two-Track Regulatory Regime*, 2 TIDSSKRIFT FOR RETTSVITENSKAP (2019).

7. Appendix

This appendix contains:

Questions from the IBA survey relevant to the development of the Discretion Index

Regression analysis of the sub-variables

Democracy Index compared with the independence of the courts

Discretion Index compared with the World Justice Project's Rule of Law Index

7.1 Questions from the IBA survey included in the Discretion Index

The survey is based on responses to the following questions (Numbers refer to the numbering of questions in the IBA survey).[38] The response to the different questions make up the sub-variables listed in table 1. Question 2.1.1 to 2.1.3 provides the data for the score given on the *opportunity to skip the case*. Survey question 2.1.4, until 3.2.6 and 3.5 will either contribute to *de jure bargaining freedom* or *de facto bargaining freedom* or both depending on the respondent's explanation and reference. E.g. if the decision to plea bargain is granted to the prosecutor by law the *de jure* score in influenced. If the opportunity to plea bargain in practice is exercised by the prosecutor thought a norm or practice the *de facto* score is influenced. Survey question 3.3 provides information about the *ex post monitoring* and survey question 4.1 provides the inputs for *transparency for the public*.

2.1 Do prosecutors have unfettered discretion with regard to the following:

2.1.1 Deciding whom to charge with a crime?

2.1.2 Deciding what charges to file?

2.1.3 Deciding whether to drop charges?

2.1.4 Deciding whether or not to plea bargain?

2.2 Which rules determine the exercise of prosecutorial discretion in your country?

2.3 Is there a threshold that determines when a prosecutor should make a decision to prosecute?

2.3.1 How clearly are the factors of this threshold defined?

3.1 Possibility for the alleged bribe payer to enter a structured settlement with enforcement authorities

3.1.1 Regardless of whether the process is formalised by law or regulations, is the resolution of foreign bribery allegation through a structured settlement possible in your country?

3.2.2 Which one of the following factors are taken into consideration by the enforcement authorities to determine the punishment imposed on the alleged bribe payer?

- Voluntary disclosure of wrongdoing/self-reporting
- Cooperation with enforcement authorities during the investigation
- Existing prevention and detection measures
  - Risk assessment
  - Training

[38] The numbering refer to the questions in the survey, only the questions used to develop the Discretion Index is included in this appendix. For the complete survey see: Abiola Makinwa and Tina Søreide, *Structured Criminal Settlements: Towards Global Standards in Structured Criminal Settlements for Corruption Offences*. International Bar Association (IBA), Anti-Corruption Committee, Structured Criminal Settlements Sub-Committee, 2018.

- Detection mechanisms such as internal, anonymous [whistleblowing mechanisms]
- Commitments to institute new prevention and detection measures
- Assistance in investigating and prosecuting individuals
- Other. Please specify

3.2.6 Are there limits on what the prosecution can offer?

3.3 Role of the court with regard to structured settlements

3.3.1 Prior to the settlement

3.3.2 Once the settlement has been reached

3.3.3 During the implementation of the settlement

3.5 *De facto* or *de jure*: In view of your answers to 3.1–3.4 above, would you describe the criminal settlement process for corruption offences in your country as a *de jure* process (i.e., one subject to clearly defined legal rules governing the proposal and implementation of structured settlements) or a *de facto* process (i.e., there is no clear legal framework for settlements)?

4.1 Public access to information on settlements

4.1.1 Is the information about settlements available to the public?

4.1.2 How detailed is the information provided about the settlement to the public?

4.1.3 Please indicate to what extent can a company negotiate the contents of the public statements on the case

7.2 Regression results/relationship between variables

Correlation matrix with the sub-variables:

	Discre~x	skipth~e	Dejure	Defacto	Expost~g	Transp~y	Democr~x	Ruleof~w
Discretion~x	1.0000							
skipthecase	0.8224	1.0000						
Dejure	0.8988	0.7113	1.0000					
Defacto	0.8017	0.4934	0.8215	1.0000				
Expostmoni~g	-0.1143	0.1301	0.2104	0.1690	1.0000			
Transparency	-0.0474	0.0752	0.1465	0.2203	0.5952	1.0000		
Democracyi~x	0.0017	0.0388	-0.1467	-0.1083	-0.3398	-0.1966	1.0000	
RuleofLaw	0.0021	0.0819	-0.1695	-0.0763	-0.3056	-0.0141	0.9113	1.0000

We observe no or minimal correlation between the Rule of Law Index, the Democracy Index, and the different sub-variables.

Source	SS	df	MS	Number of obs	=	22
				F(6, 15)	=	33.88
Model	10.6946704	6	1.78244507	Prob > F	=	0.0000
Residual	.789256881	15	.052617125	R-squared	=	0.9313
				Adj R-squared	=	0.9038
Total	11.4839273	21	.54685368	Root MSE	=	.22938

DiscretionIndex	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
skipthecase	.2102544	.0645982	3.25	0.005	.0725666	.3479423
Dejure	.3044008	.0938037	3.25	0.005	.1044629	.5043388
Defacto	.1643683	.099495	1.65	0.119	-.0477003	.3764369
Expostmonitoring	-.6097344	.1139846	-5.35	0.000	-.8526868	-.3667821
Transparency	-.0460329	.0549597	-0.84	0.415	-.1631767	.0711109
CCL	-.0273625	.1155261	-0.24	0.816	-.2736007	.2188756
_cons	1.401021	.2043629	6.86	0.000	.9654318	1.83661

The regressions indicate how the sub-variables influence the Discretion Index.

7.3 Democracy and prosecutors de facto and de jure independence.

In the data produced by van Aaken, Feld, and Voigt,[39] there is a more convincing correlation between prosecutors' independence and the Democracy Index. A prosecutor's independence tends to be higher in countries with a better-developed democracy. By regressing the variables on the Democracy Index, we find *de facto* independence to have a positive impact on democracy, with a 90 per cent confidence interval.

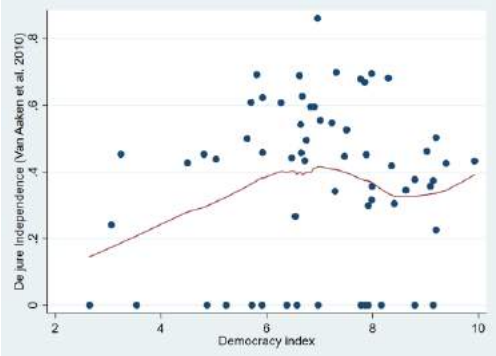

Figure 4: Democracy Index vs. de jure independence

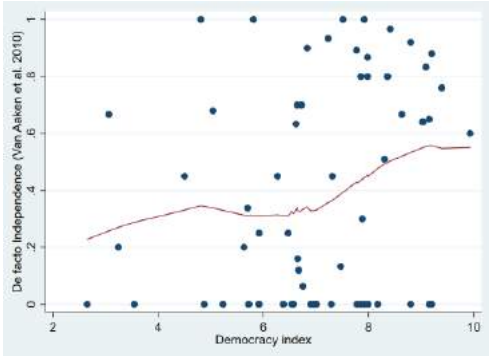

Figure 5: Democracy Index vs. de facto independence

[39] Anne Van Aaken, Lars P. Feld, and Stefan Voigt, *Do independent prosecutors deter political corruption? An empirical evaluation across seventy-eight countries.* (American Law and Economics Review 12.1 2010) 204-244.

7.4 Government spending on law enforcement

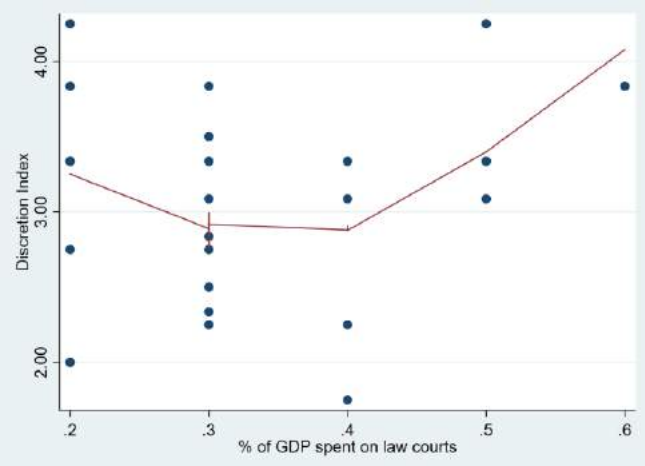

Figure 6: Discretion Index vs. percentage of GDP spent on law courts

We compared the Discretion Index with the percentage of GDP spent on law courts. Greater spending by a country on its courts correlates (marginally) with greater prosecutorial discretion. We also compared the Discretion Index with the percentage of GDP that countries spend on police. These results are rather inconclusive.

	Discre~x	gdpspe~s	gdpspe~e
Discretion~x	1.0000		
gdpspenton~s	0.0945	1.0000	
gdpspenton~e	0.0093	0.5708	1.0000

The Discretion Index correlates 0.09 with the percentage of GDP spent on law courts, and 0.009 with the percentage of GDP spent on the police.

7.5 Discretionary authority under rule of law

The World Justice Project Rule of Law Index ranks countries on a scale of 0 to 1, where the closer a country's score is to 1, the better the rule of law in that country.[40] We tested the hypothesis that countries with well-functioning rule of law will have a higher degree of prosecutorial discretion. No clear correlation was found between rule of law and the level of *de jure* discretion (the most relevant sub-variable of the Discretion Index). Countries that do well on the Rule of Law Index are spread across the spectrum of *de jure* discretion. However, no countries in the lower half of the Rule of Law scale score 5 on *de jure* discretion. As discussed above, however, countries tend to introduce more restrictions on prosecutors as their governments become more democratic, and as they reach the higher levels on the Rule of Law Index. (The correlation between the Discretion Index and the Rule of Law index is 0.027.)

[40] The WJP Rule of Law Index is based on responses from 120,000 households and 3,800 experts, which in 2019 covered 126 countries. The index relies on eight factors: constraints on government powers, absence of corruption, open government, fundamental rights, order and security, regulatory enforcement, civil justice, and criminal justice World Justice Project, Rule of Law Index, https://worldjusticeproject.org/our-work/research-and-data/wjp-rule-law-index-2019.

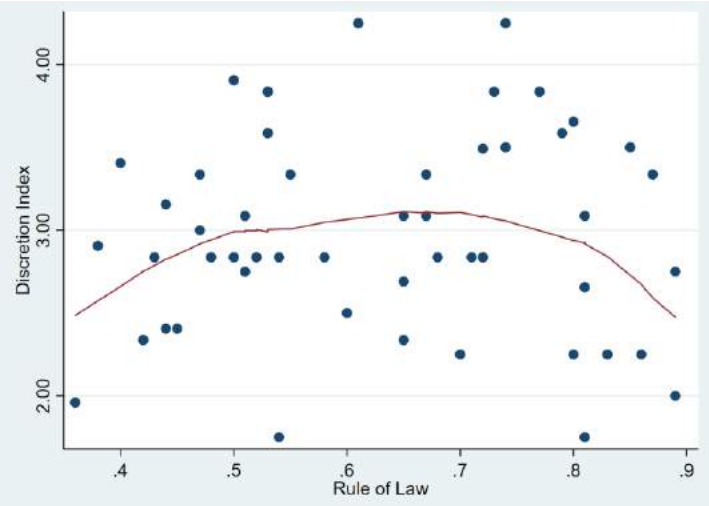

Figure 7: Rule of Law Index vs. Discretion Index

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Article 2

Settlements in Corporate Bribery Cases: The Illusion of Choice?

Co-authored with Tina Søreide.

European Journal of Law and Economics
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Settlements in corporate bribery cases: an illusion of choice?

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Accepted: 21 January 2022

Abstract

Despite prosecutors' difficulties in proving corporate bribery, nearly all enforcement actions end with a settlement at the pretrial stage. Compared to court proceedings, settlement-based enforcement provide prosecutors with flexibility to reward offenders' self-reporting and cooperation, and reach quicker conclusions to complex cases. In this article, we explain, such enforcement needs regulation to minimize potentially harmful side-effects. When the difference between a court and settlement sanction exceeds a certain size, the alleged offender accepts a settlement regardless of actual responsibility of misconduct. For the prosecutor, the option of offering a lenient settlement means weaker incentives to ascertain the material facts of the case. Society receives less information about the blameworthy act, little opportunity to evaluate the sanction, and less reason to expect sanctions to deter bribery. We show why such consequences result in under-deterrence of bribery and weaker rule of law. The use of settlement may have a self-escalating effect because the enforcement mode can reduce the predictability of the law, while a defendant's inclination to accept a settlement offer depends on the predictability of the law. Our results suggest that United Kingdom's current escalation of enforcement of corporate bribery laws will lead to a mixture of settlements and court decisions, while in the United States firms will continue to negotiate settlements as if there were no opportunity to have their cases tested in court.

Keywords Regulation · Enforcement · Negotiated settlements · Plea bargain · Corruption · Corporate criminal liability

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JEL Classifications K1 · K2

1 Introduction

In most cases of suspected international corporate bribery, prosecutors struggle to prove crime. Nonetheless, nearly all such cases are settled with a hefty fine at the pre-trial stage, even if the alleged corporate offender in many of these cases might have had a reasonable chance of being acquitted had the case been brought to court. For example, in August 2020 Herbalife Nutrition Ltd. agreed to pay the United States Department of Justice (DOJ) and the US Securities and Excange Comission (SEC) a fine of $122 million. By doing so, they ended the public investigation of their alleged violation of the US anti-bribery law, the Foreign Corrupt Practices Act (FCPA).[1] In January 2020, Airbus SE agreed to pay €991 million to conclude a bribery case with the United Kingdom Serious Fraud Office.[2] In neither of these cases have there so far been pursued cases against individuals responsible for the alleged crime, which raises the question of how complete the information available to prosecutors may have been. No individuals have been convicted in the United Kingdom in cases where the firm has accepted a Deferred Prosecution Agreement. If there was a fair chance of being acquitted, what prevented these firms from bringing their cases to court?

According to the Organisation for Economic Co-operation and Development (OECD), whose latest enforcement statistics cover 27 jurisdictions, around two-thirds of all corporate bribery cases are settled at the pretrial stage, and this share has increased steadily over the last decade (OECD 2019). In the United States, nearly all cases take the form of a settlement, while in countries such as Germany and the United Kingdom, there is a mix. In Australia, Brazil, and the Netherlands, all cases to date have concluded with a settlement. Regulations across countries differ, for example with respect to judicial oversight, transparency, the prosecutor's freedom to settle, the range of sanctions, and plea bargain traditions, not to mention the definition of corporate criminal liability. But the option of concluding cases without trial is available to prosecutors in all the aforementioned countries.[3]

Which factors determine the enforcement mode - i.e. whether a case ends by trial or settlement - and the ensuing penalty decision in corporate bribery cases? What are the implications of such enforcement for the investigation, the likelihood

[1] US Department of Justice, "Herbalife Nutrition Ltd. Agrees to Pay Over $122 Million to Resolve FCPA Case" news release, August 28, 2020.

[2] UK Serious Fraud Office, "SFO enters into €991m Deferred Prosecution Agreement with Airbus as part of a €3.6bn global resolution" press release, January 31, 2020.

[3] Makinwa and Søreide (2018) provide survey results on how firms are held accountable around the world, including in most countries in Europe. The data were collected with the help of the Structured Criminal Settlements Subcommittee of the International Bar Association (IBA), based on a survey of its members conducted in 2017. The survey is part of the project Towards Global Standards in Structured Criminal Settlements for Corruption Offences. Lawyers from 66 countries reported on how negotiated settlements are regulated around the world.

of crime deterrence, and the information shared with the public? What is the optimal level of discretionary authority for the responsible public prosecutors, and what sorts of checks and balances ought to be in place for the sake of consistent enforcement and legitimacy? While the expanding use of settlements in corporate liability cases intensifies their policy relevance, up until now, there has been little best practice guidance for governments (Ivory and Søreide 2020). In December 2021, however, the OECD Working Group on Bribery (WGB) released revised recommendations attached to the OECD Anti-Bribery Convention, and these recommendations include principles that ought to influence governments' regulation of settlement-based enforcement.[4] With respect to settlement-based enforcement, the purpose of the revisions was to protect the rule of law, promote the deterrent effect of sanctions, secure incentives for offenders' to self-report and cooperate, and strengthen law enforcement transparency. The question is whether and what governments will do to implement these principles for efficient and accountable enforcement.

In this article we consider a concern that is not addressed by the 2021 OECD WGB Recommendations, namely the determinants and the consequences of the expected "sanction gap". That 'gap' is the difference between the sanction offered by a settlement and the expected sanction if the case is brought to court. We apply a central result in the literature on plea bargaining, namely the theory developed by Reinganum (1988) for individual offenders, and explain how results may differ when the defendant is a corporation. On this basis, we discuss the prosecutor's incentives to place effort in investigation, the positive and negative sides of broad discretion for the prosecutor, the incentives to share information about the case with the public, and the dynamic implications of the use of settlements as an enforcement mode. Next, we present a review of regulations and enforcement practices. In particular, we compare enforcement systems in the United States and United Kingdom, finding that corporate offenders' inclination to accept settlements is systematically higher in the former than in the latter. We focus on the United Kingdom and the United States as these are the two biggest enforcers of corporate bribery cases to date.

2 Economic analyses of settlement-based enforcement

Litigation, court decisions, and offenders' inclination to accept an offered settlement have been subject to economic analysis for decades. Particularly relevant in this context are studies of plea bargaining, that is, situations where an offender ends the case by accepting a fine and admitting guilt. Corporate settlements rarely depend on confessions, yet the bargain is similar. The first analysis of such bargains characterized them as a transaction in which the prosecutor can obtain a guilty plea in exchange for promised leniency (Landes 1971). The probability of conviction in a trial, the severity of the crime, the prosecutor's productivity, the defendant's resources, litigation costs, and attitudes toward risk were presented as determinants of an offender's

[4] See: Recommendation of the Council for Further Combating Bribery of Foreign Public Officials in International Business Transactions (OECD/LEGAL/0378).

choice to either accept a settlement or let the case go to court. Variants of the model followed within few years, including those by Rhodes (1976), Forst and Brosi (1977), and Weimer (1978). Authors increasingly tried to test their models' power to predict individual case decisions, and in their models they sought to capture the distinct aims of crime reduction, maximization of cases concluded, and optimization of prosecutor effort per case. The analysis meanwhile took a new direction with Posner (1973), who used game theory to understand legal dispute resolution and was the first to investigate the effect of changes to procedural rules. His model captures a trade-off between types of costs, namely error cost, occurring when the prosecutor fails to fulfill her delegated tasks, and direct costs, such as costs for lawyers, judges, and security. Grossman and Katz (1983) explain why it matters to understand the defendant's private information about the expected outcome of trial: plea bargain opportunities not only have the potential to reduce resources spent on law enforcement, but also induce the guilty and the innocent to self-select into their categories.

Reinganum (1988), a central reference for this study, explains the conditions that determine when a prosecutor will offer a settlement and when a defendant will accept the offer, given two different regimes of prosecutor discretionary authority. Introducing the factor of time to determine the importance of deadlines for law enforcement, Spier (1992) explains why many cases are settled close to the date when the case would proceed to court or a few days into the court proceedings. Kaplow and Shavell (1994) find that settlements may encourage self-reporting of crime, and they argue that the extent of leniency for firms that self-report should be higher if they self-report early than if they cooperate late in the process of investigation.[5] Dervan and Edkins (2013) demonstrate that innocent individuals are prone to accept settlements, despite their innocence, a situation we investigate for innocent firms.

With respect to the institutional context, Miceli (1996) describes the relevance of law enforcement hierarchy and highlights the potential conflict of interests between the legislator and the prosecutor. Miller (1987) investigates circumstances when more than two parties have an interest in the settlement, a situation that easily leads to conflict of interests and side payments. Tor et al. (2010) study how fairness influences a defendant's decision to accept or reject a settlement.

A question that is less well resolved in this literature is how these results may vary when the alleged offender is a corporation. Procaccia and Winter (2017) explain why this constitutes a different sort of challenge, yet they focus mainly on the problem that a plea bargain with a corporation might let the natural person(s) who committed the crime off the hook, thus reducing employees' incentives to prevent crime. The literature on the economics of corporate crime and enforcement explains how sanctions should be structured to induce corporations to prevent crime and self-report incidents when they happen (Mullin and Snyder 2009; Polinsky and Shavell 2000; Arlen and Kraakman 1997). What we address is the particular trade-off between settlement and court proceedings, a highly relevant matter in corporate bribery cases.

[5] For further investigation on the deterrent effect of corporate self-reporting and self-policing, see Iwasaki (2020).

The OECD Working Group on Bribery is expected to soon announce new official best-practice guidelines for governments in this area of law enforcement.

3 Theory

How can the difference between an expected sanction in court, and a certain sanction from a negotiated settlement alter a corporation's decision-making, when choosing to accept or decline a settlement? And when will firms accept a settlement offer regardless of guilt? These are questions we seek to inform by first modeling the framework of negotiated settlements, when the defendant is a corporation, and not an individual.

Using a signaling model of plea bargaining with asymmetric information, Reinganum (1988) describes two different law enforcement regimes with different degrees of discretion for the prosecutor. Her framework for analysis is suitable for our study of corporate defendants because the mechanisms in the model capture central features of a corporate settlement agreement, considered from the distinct perspectives of prosecutors and defendants. The model was developed for analysis of enforcement against individual offenders. We explain why some results are different and more complex when the defendant is a powerful corporation. We begin by presenting our version of the theory and then modify some assumptions to make it fit our research question.

3.1 Benchmark model

Applying the analytic framework from Reinganum (1988) for our purpose, we consider a prosecutor (for now a she) who is faced with an alleged corporate offense. Based on her assessment of the available facts, she decides whether to pursue or dismiss the case, offer a settlement that ends the case at the pre-trial stage, or bring the case to court. The extent of prosecutorial discretion – classed as either limited or full discretion – determines her freedom to set the size of the offered settlement sanction. If she has limited discretion, the prosecutor has to offer the same sanction to defendants accused of the same crimes, while full discretion allows her to offer different sanctions in similar cases, taking into account factors beyond the type of crime, including the self-reporting by the offender. Reinganum considers the settlement offer subject to a guilty plea, while we assume that the settlement is offered without requiring the defendant (the firm) to plead guilty.

The model posits two types of defendants, an innocent and a guilty, subscripted i, g respectively. While the defendant's type (innocent or guilty) is the firm's private information, the distribution of guilt, known to both the defendant and the prosecutor, is such that an innocent defendant faces a weaker case than a guilty defendant, annotated $\pi_i < \pi_g$. $\pi \in [0, 1]$ is the probability of conviction in court, which we assume represents the prosecutor's perception of the strength of the case, and is the prosecutor's private information. The strength of the case depends on the evidence in the hands of the prosecutor, which in practice depends on the resources

available for the prosecutor, the complexity of the case, and the extent to which foreign enforcement agencies and the defendant itself cooperate and assist in the investigation. Efficient international collaboration between prosecutors can increase the size of π by contributing with investigation and evidence from foreign jurisdictions. The lack of international collaboration can, on the contrary, reduce the size of π by being uncooperative, slow and impeded by low competence. The direction of foreign influence on π is thus not given, and can both increase or decrease the size of π.

Faced with a settlement offer from the prosecutor, the two types of defendants will either choose the same strategy, subscripted p, or choose different strategies, subscripted s. The model includes only the game that happens after the defendant is apprehended and the case is investigated. Thus, the sequence of the game is that at time t=0 the defendant knows its guilt, and the prosecutor knows the strength of the case. At time t=1 the prosecutor acts on her private information and decides to either drop the case, make a settlement offer, or bring the case to court. Based on the action taken by the prosecutor, the defendant can update its information based on information the defendant believes the prosecutor reveals based on her action in t=1.

A defendant found guilty in court will expect to suffer a fine x, imposed on the defendant by the court.[6] If the case concludes with a settlement, the prosecutor offers to allow the defendant to pay a fine a, which includes the expected associated costs for the defendant.[7] Because a guilty defendant faces a higher probability of a guilty verdict than does an innocent defendant, expressed as $\pi_i < \pi_g$, the guilty defendant faces a higher expected sanction if the case goes to trial: $\pi_i x < \pi_g x$. Implicitly, a guilty defendant is inclined to accept a higher settlement sanction, a, than an innocent defendant, noted $a_i < a_g$. With k being the defendant's cost of going to court, the defendant's condition for accepting a settlement proposal is $a_t < \pi_t x_t + k$.[8] An innocent defendant will accept any settlement offer where $a \in [0, a_i]$, while a guilty defendant will accept a settlement offer where $a \in [0, a_g]$. a_i and a_g is thus the threshold sanction for the innocent and guilty defendant respectively.

The social cost of trial (regardless of defendant's guilt) is a cost, C, and this cost is a concern for the prosecutor when deciding whether to offer a settlement or bring the case to court.[9] The prosecutor's decision about the case depends also on her concern about the risk of sanctioning an innocent defendant (noted λ, a type 1 error) versus the problem of not sanctioning a guilty defendant (noted γ, a type 2 error). Hence, a court sanction x or a settlement sanction a yields a positive utility γx (γa) for the prosecutor when the defendant is clearly guilty. A sanction x or a imposed on

[6] For simplicity we consider x to be a fine, representing the monetary value of the sum of sanctions imposed by the court like a fine, jail for individuals in the firm, debarment etc.

[7] A settlement also imposes a cost on the defendant beyond that of the sanction, like expenses to lawyers, reputational cost, etc. we consider this cost to be part of the sanction a.

[8] The size of k will depend on several factors like the size of the case, the firm's ability to hire many and expensive lawyers, and whether or not the defendant is found guilty.

[9] The social cost of trial, C, may include a concern for the accused, in addition to society's expenses, yet the cost of trial from the perspective of the accused, k is a different variable, and therefore, k and C are presented separately.

a defendant who could very well be innocent implies a negative utility λx (λa) for the prosecutor. We will return to the implication of this assumption.

3.2 The prosecutor's objective

The prosecutor tries to maximize her utility by weighing her aversion to sentencing an innocent defendant against her desire to punish a guilty defendant, while keeping in mind the cost to society if the case goes to court. We assume that the prosecutor's perceptions in these respects correspond to those of society.[10] Her decision regarding the case depends on the extent of her discretionary authority, as mentioned: limited discretion requires her to offer the same sanction to defendants who committed the same crime, while broad discretionary authority allows her to make different settlement offers in equivalent cases. For now, we consider the case of limited discretionary authority.

Given a prosecutor with limited discretion who makes a *pooling offer*, $a \leq a_i$, which both the innocent and guilty defendant will accept because the proposed sanction is lower than the threshold sanction for either of the two defendant types.[11] The prosecutor's utility (PU) when making a pooling offer, subscripted p, will be

$$PU_p = [\pi\gamma - (1-\pi)\lambda]a. \tag{1}$$

The expression includes the positive utility of sanctioning a guilty defendant minus the negative utility of sanctioning an innocent defendant. This net utility increases with the size of the proposed sanction because the prosecutor has to offer the same sanction to any defendant, regardless of guilt. The value π that maximizes PU depends on the sign of the bracket term $[\pi\gamma - (1-\pi)\lambda]$. This term is negative if $\pi < \frac{\lambda}{\gamma+\lambda}$ and positive if $\pi > \frac{\lambda}{\gamma+\lambda}$. If the term is positive, the optimal offer from the prosecutor is $a = a_i$ which both defendants accept. If the term is negative the optimal offer is $a = 0$, and the case is dropped.[12]

Consider now the circumstance where the prosecutor makes a *separating offer* $a_t \in [a_i;a_g]$, subscripted s. Now, a guilty defendant will accept the offer while an innocent defendant declines. The prosecutor's utility is then

$$PU_s = \pi\gamma a_g - (1-\pi)(C + \lambda a_i). \tag{2}$$

The difference in utility influences the prosecutor's preference for a pooling p or separating s offer, $PU_s - PU_p$, which depends on how the prosecutor values sanctioning an innocent versus not sanctioning a guilty defendant, represented by the bracket term $\frac{\lambda}{\gamma+\lambda}$.

[10] This is a simplification. In reality, the prosecutor's disutility of sentencing an innocent (versus not sanctioning a guilty) defendant may be influenced by motifs that diverge from that of society, such as personal career development or corruption. Such aspects, however, are not the focus of our analysis.

[11] With a pooling offer, the two types of defendants choose the same strategy. With a separating offer, the two types of defendants choose different strategies.

[12] See Reinganum (1988) first proposition of a sequential equilibrium.

In summary, when $\pi > \frac{\lambda}{\gamma+\lambda}$ the strength of the case will always make it preferable for the prosecutor to offer a higher settlement offer as the expected benefit of punishing a guilty outweighs the expected cost of punishing an innocent. The optimal pooling offer is then $a = a_i$, and the prosecutor's optimal separating offer is a_g.

When $\pi < \frac{\lambda}{\gamma+\lambda}$ the portion of guilty defendants is so low that the cost of incorrectly sanctioning innocent defendants does not outweigh the benefit of sanctioning the guilty defendants. The optimal pooling offer will therefore be $a = 0$ and the optimal separating offer is $a = a_g$.

3.3 The defendant's objective

The defendant will accept a settlement offer if the proposed sanction is lower than the expected cost of going to court: $a_t < \pi_t x + k$. If considering $\rho_i = [0;1]$ the probability that the defendant in question will accept a settlement offer, the defendant's utility (DU) function is

$$DU_t = -\rho_i(\pi_t x + k) - (1 - \rho_i)a \tag{3}$$

Since a case against an innocent defendant is weaker than a case against a guilty defendant, $\pi_i < \pi_g$, the prosecutor has to offer a sanction that implies a bigger sanction gap $x - a$ to account for the weaker case.[13] When the case is sufficiently weak (when π is sufficiently low), the settlement offer a will be small enough to persuade an innocent defendant to accept a settlement rather than claiming his innocence in court.

A guilty defendant knows the prosecutor will have a strong case if it is brought to court, and therefore the sanction gap does not have to be large for the guilty defendant to accept the settlement offer. Hence, the settlement offer in this scenario is closer to what the expected sentence at court will be. However, the guilty party has less to gain from accepting the settlement compared with a court case, since in court there is a chance of being acquitted, and if that happens, the only downside is the cost of court proceedings k (which can be substantial).

Take into account the fact that the defendant is a corporation there is a clearer risk of collateral damage if it is found guilty.[14] We add c to the defendant's equation, an amount that is strictly positive and occurs with a probability θ, and study the

[13] Formally, it would be correct to refer to $E(x)$ because x is an expected variable. We simplify the expression because the difference between the expectation and and the actual sanction has no role in our model. For example, we do not consider attitudes towards risk. See Søreide (2009) for a discussion of corruption and attitudes towards risk.

[14] Collateral damages include consequences that may arise after the firm is convicted of a crime, for example debarment from public procurement, civil law suits from previous business partners, class actions or law suits from clients. Collateral damages can also be a concern when the defendant is an individual, and aspects of our extension of the model can apply to individuals, while this is not included in Reinganum's model.

implication of the possible added cost of collateral damages.[15] When the defendant is a corporation, we consider "the corporation's utility" to reflect the aggregate utility functions of the corporation and its stakeholders.[16]

$$DU_t = -\rho(\pi_t x + k + \theta c) - (1 - \rho)a \tag{4}$$

The defendant's decision to accept a settlement offer depends on the trade-off between the expected cost of the sanction offered by the settlement a with full certainty about the costs, and the expected sanction if found guilty in court x imposed with probability π. Based on the analysis above regarding the influence of the level of prosecutorial discretion on the defendant's outcome, we make the following proposition.

Proposition 1 *When exceeding a certain size, the sanction gap, $x - a$, determines the defendant's willingness to accept a settlement proposal, regardless of guilt.*

From $a = \pi x + k$ we know that $x = \frac{a-k}{\pi}$. When the defendant faces a strong case (high π), the sanction gap is smaller. When the case is weaker, with a lower value of π, the sanction gap increases. We know already that an innocent defendant will face a lower value of π than a guilty defendant. Guilt becomes less relevant for the defendant when deciding to accept or reject a settlement offer, as the gap between the sanction in court and the proposed settlement sanction is too large. Factors that increase the sanction gap include reduced sanction for self-reporting and/or cooperation, a weaker obligation for the prosecutor to verify the facts of the case, including the matter of 'corporate guilt', less information available for public scrutiny, and, for the corporate defendant, a risk of substantial collateral consequences. These factors increase the sanction gap, and may lead innocent offenders to accept a settlement, even under circumstances when the settlement penalty exceeds the expected penalty in court.

Proposition 2 *The broader the discretionary authority for the prosecutor, the larger the expected sanctions gap, and the higher is the likelihood that an innocent defendant accepts an offered settlement penalty.*

When the prosecutor enjoys broad discretion, she can apply a broader range of sanctions. The prosecutor can act more leniently towards defendants that face a weaker case (low π) which expands the expected sanction gap. By contrast, a prosecutor with limited discretion has to offer the same sanction to defendants charged with the same crime, irrespective of the strength of the case. The theory shows that

[15] While the risk of collateral damages matter for corporate defendants' decision, see Williams-Elegbe (2020), the probability of such costs is not necessarily related to any of the aspects addressed this far, and is therefore treated as an exogenous variable.

[16] While this implies an over-simplification of the corporate governance situation and possible contention within a firm, it allows us to keep focus on the prosecutor and the firm as the two parties negotiating the settlement.

the defendant with limited discretion prefers a settlement when the case is of a certain strength ($\pi > \frac{\lambda}{\gamma+\lambda}$). Considering the constraints of the prosecutor with limited sanction options, and the utility preferences when her discretion is limited, the expected sanction gap becomes smaller when the prosecutor enjoys broad discretion.

In addition, when the prosecutor has broad discretion, she can offer more complex settlement contracts (like N/DPA's) to evade the question of guilt. This places the prosecutor in a far better position for influencing the size of c, the collateral damages. Also, the risk of accumulating significant collateral damages is different for a defendant that is a firm rather than an individual. We know that for a corporate defendant to accept a settlement offer, $a < \pi x + k$. For the defendant, the collateral damages c may be greater than the expected sanction from the court case or the settlement, and occurs with a probability θ.

The collateral claims may increase the sanction gap between the total sanction in court, $\pi x + k + \theta c$, and the proposed settlement a. In result, a defendant accepts a settlement offer that is higher than the expected sanction in court. If the defendant is risk averse (or unable to accept risk because of a certain market or financial situation), the perceived consequences are inflated as if the probabilities are higher than they actually are. For the defendant, this means it is inclined to accept a settlement for a higher probability of being found innocent in court, or, a higher settlement penalty.

3.4 Results and implications

In our version of the theory, with a focus on corporate bribery cases, we introduce uncertainty around the defendant's private information. Implicitly, the level of π might be uncertain for both the prosecutor and the defendant, and low even if the defendant is guilty. A large π combined with a low x is a very different circumstance than a small π and a very high x that could potentially bankrupt the defendant. Uncertainty, combined with a wide range of possible sanctions in court and thus a risk of incurring a severe penalty, implies that the defendant has a strong incentive to accept a settlement even if the facts of the case would not fulfill the burden of proof required by a court (meaning a large π).[17]

By adding nuance to the assumptions about the private information of the defendant, the theory helps us understand when a *corporate* defendant will accept a settlement offer even if there is a substantial chance to be acquitted in court. When the defendant is a corporation there may be circumstances where the prosecutor, who cooperates with prosecutors in other countries, knows more about the defendant's guilt than the defendant itself knows. For example because the firm's management and lawyers, who represent the firm, were not part of the committed crime. If the acts were carried out by an agent on behalf of the accused firm in a foreign country,

[17] See Easterbrook (1992) for a discussion on the ethical aspects of allowing a defendant to negotiate a sanction when the pool of defendants can contain innocent actors.

the management team - despite their internal investigations - may have incomplete information about the facts of the case, and thus about the extent of their firm's "guilt" . On the other hand, the defendant may influence the strength of the case (π) for example by engaging clever lawyers. Such resources may benefit the firm in the investigation phase, the negotiating stage of the settlement, or in court. Successful international cooperation may strengthen the case and increase π. However, as such efforts are time- and resource consuming, it may give a defendant with sufficient resources space to complicate the apprehension of evidence and thus reduce the strength of the case.

The stronger the case (the closer π is to 1), the smaller the settlement discount will have to be for the defendant to choose the settlement option. This choice does not depend only on the value of π; the size of x will be equally important. The larger the sanction gap, $x - a$, the stronger the incentive for an innocent defendant to accept a settlement sanction, which also implies, the more likely it is to determine the enforcement outcome than actual responsibility for crime. Any added uncertainty regarding the defendant's guilt will result in a reduction of the sanction gap threshold at which the defendant will accept a settlement. A defendant that is a corporation may be likely to accept a settlement with a smaller sanction gap than what an individual would accept, because there is greater uncertainty regarding a corporation's 'guilt'.[18]

Limited transparency in legal practice influences the defendant's decision to accept a settlement or not, and if the expression of a general trend, it can have system-wide effects on the predictability of the enforcement system. Remember that a defendant accepts a settlement offer $a = [0;a_t]$ when he is certain about his type (guilty or innocent). When the defendant is a corporation, and less certain about its type, the corresponding uncertainty will influence the probability of a decision to settle ρ, in our model an exogenous given probability. The strength of the case π and the size of the fine x depend on the prosecutors' understanding of and experience with the law. In jurisdictions where settlements are not published, law enforcers have little case law to rely on for guidance. Firms and individuals base their understanding of the law on publicly available information. Absence of such information may increase the use of settlements, because defendants choose to accept a settlement caused by the uncertainty of legal practice.[19] In jurisdictions without judicial review of settlements, the prosecutor has broad freedoms when applying the law (Søreide and Vagle 2020). If that means the proportionality between the offense and the sanction becomes more blurred, it easily reduces the predictability across cases, and this is especially a problem when there is little public information about the cases and enforcement outcomes. In common law countries, and to some extent civil law countries, where the holdings in tried cases contribute to the development

[18] In the plea bargain literature this is already a much addressed concern, see for example Grossman and Katz (1983), and here we explain why the problem is not any smaller for corporate offenders, even if these are assumed to engage clever lawyers for such circumstances.

[19] See Mungan (2019) for a comparison of N/DPAs and convictions, and the different effect these law enforcement tools have on public information on deterrence.

of the law, having few cases go to trial can be detrimental to the development of the law. More explicit regulations might make up for some of the uncertainty that the lack of case law create. As we show in the model, it is less likely that strong cases (high π) go to court. Thus, we are left with a situation where only the weak cases are tried in court, and the reverse of the maxim of "hard cases make bad law" become true, as we get "weak cases make bad law". If the heightened uncertainty associated with enforcement increases defendants' inclination to accept settlements, this theory shows, the use of settlements easily becomes self-escalating: in other words, more use of settlements will increase the use of settlements.[20]

In addition to considering the strength of the case when deciding which segment of the sanction range to apply, the prosecutor will evaluate the consequences imposed on the defendant, including potential collateral damage. Both c and θ are of unknown sizes, and the interpretation of the size of these variables can be influenced by both parties. The understanding of the probability θ of collateral damage can be artificially inflated by the defendant, making the prosecutor more prone to choose a settlement than a guilty plea or a court case.[21] For example, if a firm that relies heavily on government contracts risks debarment from public procurement, the defendant may succeed in convincing the prosecutor that the ensuing debarment will have unreasonable large consequences for the firm and society. The risk of debarment creates an artificially large sanction gap that may lure prosecutors to offer a settlement, instead of bringing the case to court.[22]

In the model we address how the prosecutor is influenced by her *moral cost*, noted $\frac{\lambda}{\gamma+\lambda}$. The prosecutor's moral cost, combined with the prosecutor's degree of discretion, influences her settlement offer, which in turn influences the size of the sanction gap, and the defendant's willingness to accept the settlement proposal. From the bracket term γ is the utility of sanctioning a guilty defendant, and λ the negative utility of sanctioning an innocent defendant. If the value of λ is low and the prosecutor has limited discretion, the prosecutor can only offer the same sanction to defendants who have committed the same crime, at the bottom of the sanction scale. The value of λ therefore determines whether a prosecutor with limited discretion will apply the same sanction spectre as the prosecutor with full discretion. As λ

[20] Both the United States and the United Kingdom publish summaries of concluded settlements. Across other jurisdictions, this varies greatly, from full transparency to no transparency (Makinwa and Søreide 2018).

[21] An example of this is the SNC Lavalin case where the Canadian Prime Minister Trudeau, who sided with the firm, stated that "[...] a criminal conviction would imperil jobs in Quebec because it would have barred the company from bidding on government contracts." Eventually the firm was not debarred because a subsidiary of the firm accepted a settlement which did not include the parent company. See: https://www.nytimes.com/2019/12/18/world/canada/snc-lavalin-guilty-trudeau.html.

[22] The argument of avoiding debarment was important in the DPA between SFO and Rolls Royce, as "A DPA is a statutory means by which a company can account to a court for conduct without suffering the full consequences of a criminal conviction, which might include international disbarment from competition for public contracts." See: https://www.sfo.gov.uk/2017/01/17/sfo-completes-497-25m-deferred-prosecution-agreement-rolls-royce-plc/ However, in most countries firms are seldom debarred, despite procurement regulations that call for mandatory debarment following a guilty plea or verdict (Auriol and Søreide 2017).

increases, the negative utility of sanctioning an innocent defendant increases. Because of this, the prosecutor will have to increase the proposed sanction in order to reduce the chances of sanctioning an innocent defendant. We remember that the prosecutor who enjoys full discretion can tailor the proposed settlement to each defendant. Another effect of low values of λ is that the level of π required for the prosecutor to consider sanctioning a defendant is lower, meaning that the prosecutor with a low λ is willing to sanction a defendant with lower quality of evidence.

Finally, a public prosecutor is subject to a budget constraint, which induces the prosecutor to consider the marginal utility of the alternative enforcement modes, i.e. settlement or trial, with respect to their ability to deliver the intended social benefits, such as crime deterrence. For a given budget, the prosecutor will maximize enforcement by allocating resources in a manner that allows the marginal utility of the two enforcement modes to be the same. The optimal combination of settlement and trials will depend on the marginal impacts of the two enforcement modes, respectively, which is unknown. Even if settlement is less costly per case than trials, it is not necessarily the favoured enforcement mode. For example, the two options may be found similar in terms of marginal utility per euro spent if court proceedings are perceived to be many times as effective in terms of deterrence.

4 Legal analysis

Regulation of corporate bribery is largely a result of cooperation through international institutions like the OECD, the World Bank, the United Nations, and the European Union. Their conventions have resulted in a more harmonized legal framework than what was available until the late 1990s. Corruption is now criminalized across the globe, and many countries include bribery carried out abroad in their penal codes. Substantial variation in enforcement practices and in the specific legal requirements for liability limits the de facto harmonization of the rules, and this is especially the case for corporate liability. In this section we substantiate the analysis presented above by reviewing current regulations on corporate liability in bribery cases, and we investigate the extent to which enforcement practices support our theoretical claims. We describe the prosecutor's legal space for offering settlements in the United States and the United Kingdom and explore corporate offenders' incentives to accept a settlement in circumstances where there are doubts about the evidence against them.

The economic analysis suggests that the greater the expected sanction gap, the higher the penalty a defendant will be willing to pay to avoid trial. Even innocent defendants are inclined to accept a sanction that ends the case if the consequences of going to court are both substantial and unpredictable. Our findings suggest that when the defendant is a corporation, the uncertainty about guilt and the risk of substantial collateral damage will further increase the defendant's inclination to accept a settlement. In fact, an innocent defendant may well accept a settlement penalty that significantly exceeds the expected sanction by a court if the indirect consequences of a court case are substantial. What we seek now is to study factors that determine the expected sanction gap, considering what we know about expected sanctions,

the predictability of the enforcement system, and the rule of law.[23] The prosecutor's extent of discretion is critical in this respect, because as shown, it affects the enforcement system's predictability and thus the corporate offender's decision to accept or decline a settlement.

If the legal system is too rigid, the prosecutor is left with very limited tools when trying to combat complex corporate crime. Corporate bribery cases are often so complicated that it is impossible to tailor a legal system to cope with these types of crime without a certain degree of discretion. Neither the prosecutor nor the defendant desires a legal framework that is too rigid or too flexible.

4.1 Regulation and enforcement in the United States

We begin with a brief presentation of the relevant legal framework and enforcement practices in the United States, focusing on the factors that define the sanction gap.

4.1.1 Corporate liability in bribery cases

The United States regulation of corporate liability in bribery cases is characterized by broadly defined corporate criminal liability, extensive use of negotiated settlements, and a range of laws that provide prosecutors with extensive authority (Arlen and Buell 2020). Companies can be held vicariously liable for crimes committed by their employees,[24] including for bribery. US bribery enforcement is harmonized with international conventions such as the United Nations Convention against Corruption (UNCAC) and the OECD Anti-Bribery Convention.[25]

The United States practices three forms of settlements, plea bargain, DPA and NPA. A plea agreement is considered a settlement with conviction, while Non-Prosecution Agreements (NPA) and Deferred Prosecution Agreements (DPA) are considered without conviction.[26] When the settlement does not require a guilty plea, the risk of other jurisdictions pursuing the same case increases if the question of blameworthiness is not sufficiently addressed by the settlement process. This is a risk associated with N/DPAs, which can potentially increase the total sanction if sanctions from other jurisdictions are "piled on" the initial settlement accepted by the defendant (Pieth 2020; Oded 2020).

[23] In this context we consider rule of law to "require [...] that limitations on the legal rights of individuals must be determined by laws, rather than by potentially arbitrary and unconstrained decisions of individual government actors" (Arlen 2016). For an extended analysis of the rule of law see Fallon (1997).

[24] This type of liability is known as *respondeat superior*, meaning that the principal can be held liable for crimes committed by their agent if the principal gains, or was intended to gain, from the crime committed. When the principal is a corporation the agent can be any employee of the firm, even a low-level employee.

[25] Officially, the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions.

[26] An NPA or DPA is considered a settlement without conviction if the terms of the agreement are fulfilled. An NPA is not filed in court, and if the defendant fulfils the terms of the agreement with the prosecutor, the case is then closed. A DPA is filed with the court but put on hold, and it can be withdrawn if the defendant fulfils the terms of the agreement. From here on, we will refer to them jointly as N/DPAs.

Efficient enforcement is not a result of corporate criminal liability alone. A range of *background laws*, as described by Arlen and Buell (2020), bolster the position of the prosecutor vis-à-vis the defendant and facilitate enforcement in corporate bribery cases. Laws regulating attorney-client privilege, protections against self-incrimination, and accounting provisions supplement the tools available to the prosecutor who is building a case against a corporation. Such sorts of regulation increase prosecutors' ability to secure evidence and cooperation from the alleged corporate offender and ease the US enforcement of corporate criminal liability.

4.1.2 Enforcement practices

In the period 2005 to 2018, the United States enforced its corporate bribery regulations in a higher number of cases than all other countries combined.[27] US prosecutors have brought 263 enforcement actions against bribery of foreign officials, and 65 percent of these cases are toward US firms or US nationals (TRACE 2019). Between 1992 and 2019, no corporate bribery case ended in a trial conviction in the United States (Alexander and Cohen 2015; Garrett 2014). They were concluded instead by negotiated settlements, which means, in most cases, that the assumption of an independent party - a judge - in place to evaluate wrongdoing does not apply. In practice, the prosecutor is responsible for investigation, for proposing a sanction, and for enforcing the agreed sanction.

In cataloging and analyzing the results of 486 settlements[28] between publicly listed companies and the US Department of Justice in the period 2003-2011, Alexander and Cohen (2015) and Garrett (2014) find that there was a steady increase in the use of settlements. They also find a shift toward the resolution of cases through settlements like N/DPAs rather than through guilty pleas. Agreements with a confession (plea agreement) used to be the predominant form of settlement, but agreements without confession (N/DPAs) made up an increasing share of settlements after 2005 - after which we also saw bribery cases and antitrust becoming the most prominent settlement crime categories. Enforcement data in the United States are now more readily available and show that the number of settlements stabilized in 2011 at 25 to 40 cases per year. Despite memos guiding the use of settlements and judiciary review (apart from NPAs), the increasing use of settlements has implied expanded discretionary authority for prosecutors.[29]

US prosecutors use the United States Sentencing Guidelines (USSG) to determine the range of sanctions applicable to a specific crime. The prosecutor applies a formula specified in the USSG to reveal the expected sanction range that would

[27] For a better understanding of the corporation's role in international bribery cases, and insights into enforcement cases brought by the DOJ see (Chan et al. 2021).

[28] This figure comprises all known settlements in the given period, resolved though a plea bargain, NPA or DPA. The settlements do not only deal with corporate bribery, but also antitrust, fraud, tax evasion, and environmental violations.

[29] See, for example, Gibson (2018).

apply if the case were to go to court. The prosecutor can then offer sanction discounts that the defendant would receive as part of accepting the settlement.

To illustrate the potential size of the sanction gap, we provide an example from the Panasonic Avionics Corporation (PAC) case.[30] Table 1 shows the offense level calculation, based on a table in the USSG. This is used to calculate a base fine; in this example, the base fine is $122,681,975.[31] A multiplier is applied to the base fine to produce a range of fines that the defendant can expect if the case goes to court (Table 2). Finally, the prosecutor calculates a culpability score, awarding the firm in this case a 20 percent discount because it fully cooperated in the investigation.

The fine that PAC agreed to pay was $137,403,812, which was 20 percent below the minimum fine and 60 percent below the maximum fine, given the stipulated sanction range. PAC also paid $143 million in disgorgement to the SEC.[32] The total fine paid amounted to more than $280 million. Even so, it was below what economic theory postulates is necessary to deter bribery, given the size of contracts PAC secured through bribery. In this case, the fine is similar in size to the $275 million that PAC paid to sales agents in the Middle East and Asia for the sake of securing contracts between 2007 and 2017. From the published settlement we know that PAC's agents usually get 6 to 10 percent of the net contract amount.[33]

The highest possible sanction from the example above does not include the cost of trial and possible collateral claims. To reach the actual total cost if PAC were to decline the settlement offer, estimates of the cost of trial and collateral damage have to be added (remember k and c from the theory section). If these costs are added, the sanction gap widens, and the defendant's option of choosing to decline a court case becomes not a real choice but an illusion.

4.1.3 Indicators of a sanction gap in the United States

As a common law country, the United States relies on guidance from the Department of Justice for direction of enforcement practices. This guidance will often take the form of a memorandum. The Thompson memo of January 20, 2003, now incorporated into the Justice Manual, introduced the option of settlements in cases where the defendant cooperates, or where a settlement is in the interest of the general public, referring to the general guidelines for NPAs.[34] There is, however, no guidance that clarifies when a DPA is appropriate (Levy 2011).

The Justice Manual emphasizes self-reporting as one of the aims of N/DPAs, and in fact self-reporting and cooperation are required to be eligible for an N/DPA.[35]

[30] United States v. Panasonic Avionics Corporation (D.C.Cir. 2018).

[31] Based upon USSG § 8C2.4(a)(2), and because the pecuniary gain exceeds the fine in the Offense Level Fine Table from the 2014 USSG, pursuant to § 8C2.4(e)(1).

[32] US Department of Justice, "Panasonic Avionics Corporation Agrees to Pay $137 Million to Resolve Foreign Corrupt Practices Act Charges," news release, April 30, 2018.

[33] SEC administrative proceeding no. 3-18459 against Panasonic Corporation, https://www.sec.gov/litigation/admin/2018/34-83128.pdf.

[34] United States Justice Manual 9-27.600-650.

[35] Ibid. 9-27.600.

Table 1 Calculation of the offence level

Base offense level	7
Pecuniary gain of more than $65,000,000	+24
Conduct outside the U.S.	+2
Total	33

Note: Based upon USSG § 2B1.1

However, given that all corporate bribery cases in the United States are settled through an N/DPA, self-reporting and, especially, cooperation appear to be broadly defined. The incentive for a firm to cooperate is the option of receiving a reduced sanction, faster conclusion of the case, and more predictability. A firm that cooperates but did not self-report can get up to a 25 percent reduction of the intended sanction, increasing to as much as a 50 percent reduction if the firm both cooperates and self-reports. This reduction further increases the sanction gap between the expected sanction in court and the proposed settlement. Given United States enforcement practices and use of N/DPAs, the maximum sanction imposed through a settlement cannot exceed the maximum sanction available in court.

The United States is among the OECD countries that grant their prosecutors high degree of discretionary authority. Søreide and Vagle (2020) examine the extent of discretion available to the prosecutors in 66 countries.[36] As more FCPA cases are brought by the SEC and DOJ, however, the guidelines for US prosecutors develop in greater detail, which has decreased the prosecutor's discretion. Guidelines, such as the United States Justice Manual, increases the predictability of the legal process of N/DPAs.

The court system in the United States has characteristics that are associated with uncertain predictability with respect to both process and expected sanction.[37] The debated outcome of a jury process affects the predictability of a court case in the United States (Davis 2019). The greater procedural predictability of N/DPAs together with a lack of predictability in US courts and potential collateral claims makes a settlement the only viable option for a firm when this option is granted to them by US law enforcement. The United States publishes summaries of settlement agreements online and performs well in that respect, according to the OECD Working Group on Bribery (OECD 2016).

4.2 Regulation and enforcement in the United Kingdom

The legal framework for corporate liability and enforcement of bribery cases in the United Kingdom is inspired by US regulations, but there are important differences

[36] Søreide and Vagle (2020) present a measure of prosecutorial discretion that allows for cross-country comparison. They use this measure to study relationships between the freedoms granted to the prosecutor and countries' notions of criminal law efficiency, as well as their political and economic context.

[37] We do not address the fact that some judges are elected in the United States. As we study corporate bribery cases, which are usually brought in federal court, where the judges are appointed, the election of judges is not relevant for our study.

Table 2 Calculation of the fine range

Base fine	$122,681,975
Multipliers	1.4 (min) / 2.8 (max)
Fine range	$171,754,765 / $343,509,530

with respect to both regulation and enforcement practice. The United States has both NPAs and DPAs, while the United Kingdom only uses a form of DPA.

4.2.1 Corporate liability and enforcement in bribery cases

The United Kingdom, like the United States, forbids bribery, and to a certain extent holds corporations liable for actions committed by individuals acting on behalf of the firm.[38] The Bribery Act 2010 criminalizes illegal practices and is harmonized with international conventions.[39] The Serious Fraud Office is mandated to investigate and prosecute corporate bribery cases in the United Kingdom.[40] When the prosecutor considers prosecution, it must fulfill a two-stage test required by the Code for Crown Prosecutors, comprising the evidence stage and the public interest stage. A settlement with conviction is organized in the United Kingdom through a guilty plea. By comparison with the United States, in the United Kingdom the court is much more involved in the decision to impose a settlement, which is an effort to protect the public interest. Through a guilty plea, the defendant pleads guilty to some or all of the charges raised by the prosecutor. The defendant can also settle with the prosecutor on an appropriate sentence range. While the UK generally adheres to the identification doctrine, Section 7 of the UK Bribery Act 2010 introduces an exception (OECD 2016). However, UK courts reject that crimes committed by a lower level employee can be attributed to the firm. For corporate criminal liability to apply, the crime has to involve senior management (Arlen 2020).

The United Kingdom practices settlements without conviction through a DPA (OECD 2016).[41] The United Kingdom Crime and Courts Act 2013 requires the director of the Serious Fraud Office (SFO) and director of the Crown Prosecution Service (CPS) to publish a guideline on how to interpret the application of DPAs. This guideline is the Deferred Prosecution Agreements Code of Practice (DPA Code). The process toward a settlement has two initial steps. Given sufficient evidence to fulfill the evidence stage, the director of the SFO or the CPS considers whether it is in the public interest to enter into a DPA instead of bringing a regular court case or, alternatively, dismissing the case. If the public interest test is met, the

[38] The Bribery Act 2010 is the United Kingdom's criminal law relating to bribery. See Arlen (2020) for an assessment of the narrow scope of corporate criminal liability in the United Kingdom.

[39] United Nations Convention against Corruption (UNCAC) and OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions.

[40] See (Lord 2013) for an analysis on the development of formal and informal systems of law enforcement in the United Kingdom to combat international corporate bribery.

[41] See the page on Deferred Prosecution Agreements on the SFO website, https://www.sfo.gov.uk/publications/guidance-policy-and-protocols/deferred-prosecution-agreements/.

SFO and CPS directors are only two prosecutors who can enter into a DPA, according to the Code. The defendant cannot demand a DPA; it is at the prosecutor's discretion to invite a defendant into a negotiation, and when a defendant is invited to negotiate, there is no guarantee that a DPA will be offered (see the DPA Code). The DPA Code recommends not entering into a DPA if the firm is a repeat offender, if the conduct is part of its established business practice, or if the compliance program was obviously inefficient.[42] The guidelines give a fairly detailed description of the aspects to be considered, but the interpretation of how these aspects should be weighed - for example, how much cooperation is required for cooperation to be deemed sufficient - is not determined by the DPA Code.

A DPA can only be offered to firms, it cannot be offered to individuals. If accepting a settlement means that individuals risk a separate enforcement process for the crime imputed to the corporation, this may reduce the corporate defendant's inclination to accept a settlement. So far, however, no individual has been charged after the firm he or she represents has agreed to a DPA, despite the fact that ultimately, corruption stems from decisions made by individuals Gorsira et al. (2021). Compared to a court case, a settlement leaves less information available to the public, the prosecutor, and other judges. Over time, the limited availability of case law results in less predictability and offers less guidance to prosecutors and judges unfamiliar with corporate bribery cases.

As of 2019, the United Kingdom has brought a total of 37 enforcement cases concerning bribery of foreign officials. This is the second-highest number worldwide (the United States has seven times more cases) (TRACE 2019). Of the UK enforcement actions conducted, nine cases concluded with a DPA.[43] The SFO's settlement with Rolls-Royce is a recent example of enforcement practice in the United Kingdom. Under British law, firms are required to self-report and cooperate in order to be awarded a DPA and in order to be eligible for a reduced sanction.[44] Rolls-Royce did not self-report, but they were nonetheless offered a DPA and their sanction was reduced. This contradicts the criteria stated in the legal framework of the DPA for the United Kingdom.[45] The reason why Rolls-Royce still got the reduced sanction was that once the SFO started the investigation, the firm exposed evidence of other crimes to the SFO. The SFO concluded that they would not have been able to obtain this information had Rolls-Royce not handed it over to them. For that reason, the firm was given a reduced sanction. The SFO thus signaled that corporate offenders still can obtain a reduced sanction if they cooperate beyond the part of the crime that the SFO exposes.

[42] DPA Code, sections 2.8.1.i-iii.

[43] For more information on the cases, see the Deferred Prosecution Agreements page on the SFO website (see supra note 24).

[44] DPA Code.

[45] Ibid.

4.2.2 Indicators of a sanction gap in the United Kingdom

The United Kingdom has introduced settlements as DPAs (OECD 2017). Settlements are regulated by the Crime and Courts Act 2013, but as the United Kingdom is a common law country, the practical implications of the settlement will be determined though precedence and case law. Details about the DPAs are made publicly available as long as they do not interfere with an ongoing investigation.[46]

The United Kingdom sentencing guidelines for corporate bribery allow for unlimited monetary sanction.[47] When establishing the harm, represented by a financial sum, the UK sentencing guidelines use "the gross profit from the contract obtained, retained or sought as a result of the offending" or "the likely cost avoided by failing to put in place appropriate measures to prevent bribery." If the harm is difficult to establish, the court may use general revenue as a starting point and consider 10-20 percent of the revenue as an estimate of the amount achieved from the offense. In large fraud or bribery cases like the Libor case,[48] other measures of harm may be justified.[49] The sentencing guidelines give the court some guidance on how to establish harm, but the amount of discretion is large, which influence the expected sanction gap.

Corporate bribery often involves several jurisdictions. If the defendant risks sanctions in more than one country, the sanction gap can further increase. DPAs are encouraged in the United Kingdom in order to take into account enforcement actions in other countries.[50] The intention is to prevent the piling on of sanctions, which can happen when different jurisdictions, or different prosecuting authorities within the same jurisdiction, add sanctions for the same crime on top of the already awarded sanction. The prospect of this happening may act as a disincentive that keeps firms from opting to self-report and cooperate. Alternatively, the piled on sanctions can serve to augment fines that are initially too small to have a deterrent effect. What matters for the defendant is the total amount of sanctions imposed.[51] In addition to the potential piling on, the defendant also risks collateral claims, and the UK prosecutor is instructed to take these into account when weighing the option of a DPA.[52] A key aspect of settlements without a guilty plea is that firms can avoid collateral claims.

[46] DPA Code.

[47] Sentencing Council, "Corporate Offenders: Fraud, Bribery and Money Laundering" (hereafter referred to as the UK sentencing guidelines), https://www.sentencingcouncil.org.uk/offences/crown-court/item/corporate-offenders-fraud-bribery-and-money-laundering/.

[48] Information on the LIBOR case is available on the SFO website, https://www.sfo.gov.uk/cases/libor-landing/. The case involved alleged fraud in connection with the London Interbank Offered Rate (LIBOR).

[49] For the complete United Kingdom sentencing guidelines see: https://www.sentencingcouncil.org.uk/offences/crown-court/item/corporate-offenders-fraud-bribery-and-money-laundering/.

[50] DPA Code, section 2.8.2.vi.

[51] Oded (2020) evaluates effort by the US DOJ to reduce the unpredictability defendants face when they risk multiple piled-on prosecutions.

[52] DPA Code, section 2.8.2.vii.

When determining the sanction, the court is instructed to assess the sanction against three objectives, namely the "removal of all gain, appropriate additional punishment, and deterrence."[53] Under the United Kingdom's Bribery Act, a company charged with section 1, 2, 6, or 7 is subject to an unlimited fine.[54] Through a DPA the defendant can receive a reduction of up to one-third for an early guilty plea.[55]

5 Results and Discussion

We started by investigating mechanisms that influence the actions of both the prosecutor and the defendant in a settlement process for corporate bribery. We showed why the structure of the process largely determines the law enforcement outcome. Following this review of enforcement practices, we will now discuss the empirical underpinning of our propositions.

According to theory, the size of the difference between the expected sanction in court and the proposed settlement sanction, the sanction gap, determines a defendant's inclination to accept a settlement offer. Our legal analysis shows that a defendant in the United States hardly ever will decline the prosecutor's settlement offer if declining implies court proceedings. This is partly because the settlement offer is, as a rule, at least 25 percent lower than the lowest point of the sanction range for the specific crime, and partly because of the magnitude of additional consequences that might follow a verdict. Under these circumstances the option of criminal trial becomes an illusion, and not a real choice.

This finding supports our first proposition: if a corporate defendant will accept a settlement when the expected sanction in court exceeds a certain level, it will also do so when a court verdict involves the risk of substantial collateral damage, which increases the de facto sanction gap. When the expected collateral damage exceeds a certain level, the defendant becomes inclined to accept a proposed settlement sanction even if it is higher than the expected sanction in court. A number of factors work together to create the large sanction gap in the United States, including the opportunity to settle without pleading guilty, broad prosecutorial discretion, absence of judicial review, comprehensive background law, and a wide sanction range in court. The sanction gap in the United Kingdom is smaller, as shown by our legal review, and so there is more uncertainty as to whether a firm will accept or decline a settlement offer. Factors that limit the sanction gap in the United Kingdom include limited prosecutorial discretion, the presence of judicial review, the compliance defense, and a more limited sanction range in court.

We also find support for our second proposition, which claims that broader prosecutorial discretion increases the sanction gap, and increases the likelihood of innocent defendants accepting an offered settlement penalty. When evaluating the consequences between sentencing an innocent defendant versus not sentencing a guilty

[53] UK sentencing guidelines, Step 5, Adjustment of Fine.
[54] Bribery Act 2010, chapter 23, sections 11(2) and 11(3).
[55] UK sentencing guidelines, section 8.4.

defendant, the prosecutor with limited discretion, who also does not want an unfair outcome, considers the potential additional consequences for the corporate offender if sentenced in court. However, the burden of an unfair outcome decreases if the prosecutor can end the case without having to determine the defendant's guilt. In some jurisdictions, including the United Stated and the United Kingdom, there is no need to treat the question of someone's guilt as part of an N/DPA. That means the prosecutor largely avoids the concern about sentencing an innocent defendant or not sentencing a guilty defendant. With less reason to worry about the risk of not punishing a guilty firm, it becomes easier for the prosecutor to offer lenient treatment. This lenient treatment can allow for indirect consequences of a potential verdict to influence the offered settlement.

In our version of the theory, we introduce an inherent attribute of the "corporation's guilt," which reflects the strength of the case: the actual basis for liability will be uncertain not only for the prosecutor, but also for the defendant. This distinguishes the individual defendant from the corporate defendant, and supports our second proposition. The option of offering a settlement allows the prosecutor to spend fewer resources on investigation for the sake of establishing the material truth of the case, which means that by offering more lenient treatment, the prosecutor can complete the case with less knowledge about the facts, and thus the strength of the case. Therefore, it can be optimal for the prosecutor to investigate just enough to conclude a settlement, and still, less than what is needed to determine the exact responsibility of the crime. The legal analysis supports this claim, as prosecutors in both the United States and the United Kingdom tend to offer more lenient treatment than what is stipulated as stated goals of their law enforcement system.[56]

Beyond the support of results presented in the theory section of the paper, the legal review reveals some related enforcement patterns. First, enforcement through the use of settlement is rarely consistent with economic results on deterrence of corporate crime, partly because the aim of deterrence is difficult to combine with the aim of promoting self-reporting, and partly because prosecutors might take into account other non-legal aspects (such as "the public good," which could reflect employment or other market-related concerns). The contradiction between aims is seen, for example, when one compares the United Kingdom sentencing guidelines and the sanctions imposed on firms through a DPA. Whereas the guidelines instruct the court to remove all gain from the crime and add an appropriate additional punishment, in line with the aim of crime deterrence, the reduced sanction offered under a DPA tends to be far too lenient to accomplish the goal of crime deterrence, as seen in the Sarclad case.[57] Another case, the one against Rolls-Royce, illustrates the prosecutor's inclination toward lenient treatment. The defendant did not self-report its offenses, yet it received substantial credit for cooperation after the SFO had started

[56] See the U.S. Sentencing Commission 2018 Guidelines Manual and the U.K. Sentencing Council Sentencing Guidelines.

[57] See the page on Sarclad Ltd. on the SFO website, https://www.sfo.gov.uk/cases/sarclad-ltd/.

its investigations.[58] Both examples show a wide gap between the sanctions expected in court and the sanctions received through a DPA.

Enforcement practices in the United States are better aligned with crime deterrence because the sanctions are more severe and the benefits for cooperation more predictable (Arlen 2020). On the other hand, in countries where courts tend to impose a low level of sanctions on corporate offenders, a firm generally has little incentive to accept a settlement that is similar in size to the expected outcome in court if it has some chance of being acquitted in court. When the chance of acquittal is low, predictable lenient treatment for those who self-report secures a solid enforcement statistic because a number of factors make self-reporting prudent even if the offender found crime rational before committing the offence. Nonetheless, lenient enforcement through settlement will not necessarily deter corporate bribery.[59] Reduced penalty for those who self-report and cooperate may well be consistent with deterrence. The problem is the level of benchmark penalties, that is, the level from which the penalty is reduced. Too often, this level is too low for deterrence, but this is a problem in cases concluded in court as well. The reason why settlement might water down deterrence is primarily the offenders' perception that penalties are negotiable (combined with the fact that they are). If governments offer 'bigger carrots' (in the sense of larger penalty reductions) than the defendant deserves, given the extent of cooperation in law enforcement, the sanction loses its strength in terms of crime deterrence. However, to some extent, attributes of settlement-based enforcement may reduce this concern. Transparency of the facts of the case and reduced penalty upon cooperation are signals to other firms, not only about wrongdoing, but also the benefit of corporate compliance and self-reporting.

Second, we find that the extent of discretionary authority granted to prosecutors varies significantly across the countries reviewed by the IBA survey (Makinwa and Søreide 2018). The United States provide broad discretion to their prosecutors, while the United Kingdom is more restrictive in this respect. Broad discretionary authority enables the prosecutor to tailor the proposed sanction to what she assumes is the defendant's acceptable sanction level. This makes it easier for the prosecutor to induce the defendant to accept a settlement instead of having the case go to court. In addition, discretionary authority is decisive for the prosecutor's opportunity to exploit the whole sanction range, allowing her to offer a far more lenient sanction than what would be expected in a court case.

[58] Statement from the DOJ press release:"[...] Rolls-Royce did not disclose the criminal conduct to the department until after the media began reporting allegations of corruption and after the SFO had initiated an inquiry into the allegations [...]" See: https://www.justice.gov/opa/pr/rolls-royce-plc-agrees-pay-170-million-criminal-penalty-resolve-foreign-corrupt-practices-act.

[59] See Søreide and Vagle (2020) for a debate on efficiency in law enforcement.

6 Conclusion

We analyze how the difference between the expected sanction in court and the proposed settlement offer –that is, the sanction gap –influences the prosecutor and the defendant in their positions toward settlement as an enforcement outcome of a corporate bribery case. In contrast to former theory on the use of settlement, ours considers the defendant as a firm and not an individual, which leads to different results regarding the defendant's choices vis-à-vis a law enforcement institution.

Especially, we explain why the sanctions gap, which determines the outcome of the enforcement process, is categorically different for corporate and individual defendants. Despite better access to legal expertise, corporations are no less exposed to the risk of unfair enforcement results. We show why there might be an extreme imbalance between the expected cost associated with settlement and trial, respectively, which in the end, weakens the rule of law. We also find that the prosecutor has an incentive to offer a lenient settlement if doing so reduces her duty to ascertain the material facts of the case.

The prosecutor's discretion to influence the application and content of the settlement offer influences the defendant's incentive to accept or reject a proposed settlement. Broader prosecutorial discretion increases the sanction gap, as the prosecutor will have more options to tailor the proposed sanction to the specific defendant. If the defendant can avoid pleading guilty but still receives a settlement offer, the sanction gap increases, as the defendant can avoid collateral claims. Upon the theoretical analysis, we reviewed legal regulations and enforcement practices in the United Kingdom and the United States. This help explain why a defendant may accept a settlement sanction that exceeds the expected sanction in court, regardless of actual responsibility, if there is a realistic threat that a guilty verdict will lead to substantial collateral damage to the firm.

Settlements in the United States and the United Kingdom have many of the same attributes, but so far, there are few cases available for review in the United Kingdom. The limited amount of information published by the SFO in the United Kingdom significantly restricts the opportunity for empirical assessment of enforcement outcomes. However, we show that the United Kingdom copies many of the characteristics of the United States enforcement system, including its use of settlements in corporate bribery cases. We explain why the difference between the expected sanction in court and the sanction proposed in a settlement offer will influence the number of concluded settlements in the United States and the United Kingdom. When the sanction gap is small, the defendant has a realistic opportunity to decline an offered settlement and have its case tested in court. When the sanction gap is large, the option of declining a settlement can appear as an illusion, and if so, it means that there is no real option of independent third-party review of the case. In the United States, we know from the sentencing guidelines that the sanction gap is large even before court costs and potential collateral claims are considered. When these are added, the sanction gap becomes large enough to dissuade almost any firm from declining a settlement offer. We also show that the increase in the use of settlement might have a self-increasing

effects, as the reduction in publicly available information increase the uncertainty regarding the practice of the law, which makes the defendant more inclined to accept a settlement offer.

Our study underscores the still existing challenges attached to the balance between efficient enforcement and fair outcomes, while investigating attributes of settlements that can help overcome some of the side-effects. Considerate use of settlements has the potential of improving the efficiency of law enforcement in corporate liability cases. This is highly needed in an ever more complex global economy, where new trends in economic crime requires a speedy development in law enforcement. As governments around the globe develop guidelines for the use of settlement in corporate bribery cases (OECD 2019), our results remind them of the importance of judicial oversight, access to case information for the public, and limits to the size of the expected sanction gap, so that corporations have a real option of having their case tried in court.

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Article 3

"Impartiality, integrity, efficiency": An Evidence-based Evaluation of the Record of Romania's Anti-corruption Directorate

Co-authored with Mihaly Fazekas and Agnes Batory.

"Impartiality, integrity, efficiency": An Evidence-based Evaluation of the Record of Romania's Anti-corruption Directorate

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Abstract

There are few objective measures on the effects of specific anti-corruption efforts. We apply five different objective measures of corruption risk in public procurement to evaluate the impact of the efforts of the Romanian Anti-Corruption Agency (DNA). We combine data on legally binding corruption cases of municipality level politicians brought by the DNA, with data on more than 200 000 public procurement tenders from 2009 to 2019, to study 42 corruption cases and their impact on the risk of corruption in public procurement locally. Using a coarsened exact matching estimator, we show that a corruption case leads to a 2.8% overall decrease in corruption risk of new public tenders and reduces the use of tender calls that are not published online by 8.8%. However, the use of short submission periods increases after a corruption case by 2.7%, and the use of single bid contracts increases by 1.4%. Our results show that a corruption case brought by the DNA reduces the corruption risk in public procurement locally. However, the increase in short submission periods and single bid contracts suggests that the reduction in corruption risk is mainly related to better formal compliance with procurement procedures. Therefore, the use of high-risk tender procedures remains a significant challenge to reducing corruption in public procurement. We also find that the effect of a corruption case on the risk of corruption is decreasing over time, and regional authorities, such as municipalities and counties, are the type of public buyer associated with the highest risk of corruption.

Keywords: Anti-Corruption Agency, Public Procurement, Corruption, Romania (JEL: K1, K2)

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1 Introduction

While the many consequences of graft are widely known, there is uncertainty about certain remedies against corruption, particularly political corruption. In this article, we aim to shed light on the efficacy of an increasingly widespread tool in the fight against corruption, anti-corruption agencies (ACAs), through the example of Romania's National Anti-Corruption Directorate (Directia Nationala Anticoruptie; DNA).

The DNA appeared to deliver surprisingly good results on anti-corruption investigations and prosecution in Europe for several years. DNA officials, serving under the motto "Impartiality, integrity, efficiency", put behind bars a former prime minister, several ministers, MPs, senators, dozens of mayors and oligarchs. DNA rose to international fame as fearless graft-busters in a country long considered as one of the most corrupt, if not the most corrupt, in the EU. The European Commission hailed the DNA as European 'good practice'. The agency was a cornerstone of Romania's initial progress in tackling the endemic corruption that prevented the country from joining the EU in 2004. At the same time, perhaps no other ACA has come under as heated criticism in recent years as the DNA, as many claimed that the agency's prosecutorial decisions had been politically motivated. Attacks on the agency by a coalition of MPs culminated in the removal of the DNA's high-profile leader, Laura Codruța Kövesi in 2018, who was later appointed the first European Public Prosecutor at the then newly established European Public Prosecutors Office (EPPO).

Despite the headline-grabbing journey of the DNA, there have been few systematic attempts to evaluate the agency's track record. Has it been effective in reducing the risk of corruption in public expenditure? Has its stringency raised the risks (or perception of risk) of getting caught to the extent that at least some of those considering to engage in corruption refrained from doing so? Has the agency remained politically neutral in its prosecution decisions? We conduct an unmatched and matched comparison of the corruption risk in public procurement before and after a corruption case to address these questions. The matched comparison is based on coarsened exact matching of procurement contracts. We aim at answering the following research questions:

1. **What is the (ex-post) effect of a corruption case brought by the DNA on the risk of corruption in public procurement?**

2. **Can we detect any indices of a political bias in the prosecution decisions in the DNA, in the form of leniency towards officials affiliated with the ruling parties?**

We find that a corruption case brought by the DNA has a significant negative impact on the risk of corruption in public procurement in Romania. However, this reduction is likely related to better formal compliance to procedure rules, as there is an increase in single bid contracts and short tender submission time. Thus, we conclude that procedural correctness improves, but corrupt procurement officers still find ways to use risky procurement procedures. Descriptively we identify a tendency that more corruption cases are brought against politicians from the political opposition of the national level ruling party.

Decision-makers spend large amounts of public funds on ACAs, without clear evidence of the initiative's effect. Our main contribution to the literature is an empirical study of the effect of the Romanian ACA on

corruption risk in public procurement. We conduct the following steps to answer our research questions. First, we review the current literature on ACA's in general and specifically for Romania. Next, we present our data before explaining our measurement model and the methodology. This model is then applied in our analysis before presenting our result and concluding.

2 Anti-corruption agencies and the economics of crime deterrence

An ACA is a tool that governments introduce to deter corruption with more or less real effort. We briefly review the literature on ACAs, present the DNA and reflect on the economics of crime deterrence to give an overview of the context and theoretical framework from where our research departs.

2.1 Anti-corruption agencies

Several among the 'new' member states in the EU established anti-corruption agencies, many in the years prior to their EU accession. The literature is scarce on how these agencies have fared since EU accession. Still, existing comparative work shows that ACAs must navigate a precarious course between independence from and impartiality towards powerful political players, who can potentially cause budget cuts, dismissals, weakened competencies on the one hand, and strong operational capacities put in the service of ruling parties on the other (Recanatini & Doig, 2020). We want to address the curious imbalance that "While the causes and consequences of corruption have been widely discussed among academics and practitioners, systematic and comparative evidence is lacking on the determinants and effects of anti-corruption policies, especially ACAs" (Gemperle, 2018).

At the latest count, 114 countries have established ACAs (Schöberlein, 2020), defined as a permanent state body with a specific mission and corresponding preventive or law-enforcing functions to counter corruption and its underlying structures (Gemperle, 2018; De Sousa, 2010; Meagher, 2005). This stunning spread around the globe has to do with the famous success stories of Hong Kong and Singapore's anti-corruption commissions, which inspired a range of jurisdictions to create national anti-corruption agencies (Recanatini & Doig, 2020). In Europe, most agencies date to the 1990s and EU accession conditionally: many CEE countries established new specialised bodies, whereas Western European countries tended to reinforce or reform their existing law enforcement agencies' anti-corruption mandates and capacities (Schöberlein, 2020). ACAs may be dedicated to prevention and policy coordination, investigation and prosecution, or in the case of multi-purpose agencies, all of these functions (OECD, 2008; Dionisie & Checchi, 2008).

The literature on ACAs has evolved from early enthusiasm for the model to more critical accounts, as agencies were increasingly established in contexts that were not suitable (De Sousa, 2010; Heilbrunn, 2004; Meagher, 2005; De Maria, 2008; Klitgaard, 1988). Scholarship noted the "meagre results obtained by some of them" (De Sousa, 2010), or even "no impact of anti-corruption agencies" in poor-quality governance contexts (Mungiu-Pippidi, 2011). A recent comparative study similarly found no evidence that the existence of a specialised anti-corruption body would result in the indictment of more senior political leaders (Popova & Post, 2018). Indeed, reputational

approaches to agency performance rely heavily on explanations centred on managing one strategic resource: the credibility agency officials accumulate and cultivate over time (Di Mascio & Piattoni, 2020; Bautista-Beauchesne, 2021). Assertiveness in going after the "big fish" and the ability to produce visible results, chiefly in the form of high-profile arrests, is also commonly referred to as crucial ingredients to success (Klitgaard, 1988; De Sousa, 2010). However, there is no escaping the fact that reputation management alone cannot compensate for the absence or low level of legal guarantees against interference, inadequate resources or qualified staff: indeed, many if not most agencies fight corruption "with their hands tied", operating "in environments of weak governance and low resources" (Prateeppornnarong, 2021; Dávid-Barrett & Fazekas, 2020).

While some problems commonly apply to the whole universe of cases (notably, insufficient resources compared to the scale of the task, except for the earliest South-East Asian agencies), others seem to tend to go with particular types of agencies. The multi-purpose agencies may give rise to disputes over competence with existing bodies (e.g., police, prosecution service) (Schöberlein, 2020; Recanatini, 2011). Coordination and preventive bodies avoid this pitfall but tend to be relatively toothless. Law enforcement type of agencies, such as specialised prosecution services, may be particularly prone to capture, since they are particularly suitable for serving as the 'attack-dogs' of the governing party or parties who use law enforcement to discredit or remove opponents from the political game while overlooking corruption within the ranks of those in office (Batory, 2012). Agency competencies and independence are thus the crucial variables in any account of ACA performance.

What structures ACAs' ability to maintain distance from party politics? One set of factors relates to agencies' design, which Recanatini & Doig (2020, p. 291) argue is one of the most critical success factors for ACAs. The agency needs to address questions such as: "Have ACAs been able to address the corruption 'problem' which is what they are set up to do? Is a dedicated agency the effective response, as part of a risk-based anti-corruption strategy?" and "(I) Was the 'problem' sufficiently defined to justify the need for a dedicated and often new agency? (II) Does such a definition provide the basis from which to design a fit-for-purpose agency and ensure its effective functioning? and (III) Were wider issues, such as the agency's organisational development and maturity, and its fit within its external institutional and operating environment taken into account?"

2.2 The economics of crime deterrence

An efficient government has to rely on strong institutions and public officials who manage their discretionary authority in line with the aims of the public. On the one hand, too much control, checks and oversight can increase red tape and make decision-making slow and bureaucratic. On the other hand, too little control and oversight can pave the way for corruption and inefficient use of public funds, where public officials use their wide discretion to achieve private goals, instead of those of society.

The trade-off that a potential criminal individual faces is the net benefit of committing a crime, versus that of abiding by the law. Both actions have advantages and disadvantages, and there is uncertainty related to both the potential upside and the downside. Several concerns beyond that of monetary gain/loss drive the net benefit of committing a crime. Certain individuals will refrain from committing a crime because of the moral

cost, which can make up for a large monetary gain, as they are law-abiding citizens (Søreide & Rose-Ackerman, 2018; Klitgaard, 1988).

The net benefit of the crime can be influenced by changing the probability of detection, or the magnitude of the sanction. The latter is easier to influence than the former. Fundamental economic theory of crime deterrence, which departed from Becker (1968), models a situation of full deterrence if the size of the sanction can be set infinitely high. If the probability of detection is equal to one, the size of the sanction that deters a rational individual from committing the crime can be set equal to the marginal benefit of committing the crime (Søreide, 2016). In practice, law enforcement agencies have to consider trade-offs to achieve efficient crime deterrence. This is a trade-off between a trust-based system for detection and a threat-based system for deterrence. Too much leniency for self-reporting and cooperation can reduce the threat of a substantial sanction deterring individuals from committing crime. Another trade-off is balancing flexibility and predictability. A predictable law enforcement system is necessary for individuals to understand the law and refrain from crime, while more flexibility enables a law enforcement system that can be better tailored to the specific case and its context.

3 The country case of Romania

The DNA serves as a suitable case for a data-driven analysis of the efficacy and independence of a relatively well-resourced, highly competent agency with strong legal powers, committed, high-profile leadership, and strong support both from the EU and the public.

3.1 Background and political development

The DNA was established with a mandate to investigate, prosecute and prevent medium and high-level corruption in Romania, and as such it is the key anti-corruption institution alongside the National Integrity Agency (ANI), which is in charge of monitoring income and asset declarations. The Directorate is an independent organisation organised under the Supreme Court of Romania, outside the usual prosecutorial structure. DNA prosecutors have protected legal status as magistrates. The agency's main office is in Bucharest, and it has 14 regional offices, located in the same cities as the Romanian courts of appeal.[1]

Following its establishment in 2002, then as a prosecution office, the DNA was off to an unpromising start, but in 2007 its mandate was expanded and reinforced under Justice Minister Monica Macovei. Thanks in part to strong support from the European Commission, which consistently praised the DNA in its Cooperation and Verification Mechanism reports, the DNA quickly established a staggering track record of successful prosecutions of high profile individuals in business and politics, particularly after Laura Codruța Kövesi took over as Chief Prosecutor in 2013. For instance, in the first nine months of 2015 alone, the DNA under Kovesi indicted 14 former or current legislators; four ministers; Prime Minister Ponta, who resigned in November; and ten city

[1] See: https://www.pna.ro/about_us.xhtml

mayors. In 2018, PSD leader Liviu Dragnea's prosecution ended with a jail sentence.[2] A strong indication that the agency made powerful enemies can be seen in the more or less continuous attacks it was faced with, which eventually succeeded in Kovesi's removal from office in 2018. The DNA indicted a large number of high-standing politicians from multiple parties. Adrian Nastase, PSD's prime minister from 2000 to 2004, received a prison sentence in 2012, as did PSD leader Liviu Dragnea in 2018, both charged with corruption. More recently, in 2021, Calin Popescu-Tariceanu, a former National Liberal Party leader who headed Romania's government between 2004 and 2008, was charged with receiving bribes while in office.

Yet, the DNA's record is subject to heated controversy not only in Romanian political discourse, chiefly between the Social Democratic Party (PSD) and its opponents, but also in scholarship. For instance, Mendelski (2015) concluded that "Romania's criminal prosecution of corruption has derailed into an over-zealous struggle for a 'noble cause': the growing number of prosecutions is seen as 'output-and effectiveness-driven progress' that created a 'myth of a Romanian success story'". Clark (2017, p.5) found that "Far from being above politics, Romania's National Anti-corruption Directorate (DNA) is an active participant in its partisan struggles. [...] there is clear evidence of collusion between prosecutors and the executive in Romania". Mungiu-Pippidi (2018) commented that the PSD's claims that it was only defending itself from a politicised anti-corruption drive were "not true in 2005, it has unfortunately become more accurate after 2015", as the centre-right parties pinned their hopes for electoral victory on the DNA. Descriptively the PSD's claims can be questioned, as we notice a shift in proportions of convictions between the left and right in Romanian politics from 2012 when the PSD took power. As we see in Table 1 and Figure 1, the share of right-wing vs. left-wing politicians convicted for corruption was about the same in the years before 2012. After 2012, there was a shift towards a higher number of sanctions towards right-wing politicians who were in opposition at the national level. In contrast, Lacatus & Sedelmeier (2020) found that Romania's relative success, at least in comparison with Bulgaria, can be explained by its "strong anti-corruption institutions that served as a powerful institutional base for the fight against corruption". To determine which of these claims can be verified, we now turn to the empirical assessment of corruption risk in light of the DNA's enforcement efforts.

3.2 Public procurement and enforcement in Romania

We use two sets of panel data in our analysis, constructed from publicly available information. The EU procurement data from Romania consists of all announcements of public tenders from Romania between 2009 and 2020. The second panel data set consists of enforcement data from the DNA between 2009 and 2020, collected from press releases published on the DNA web page.[3]

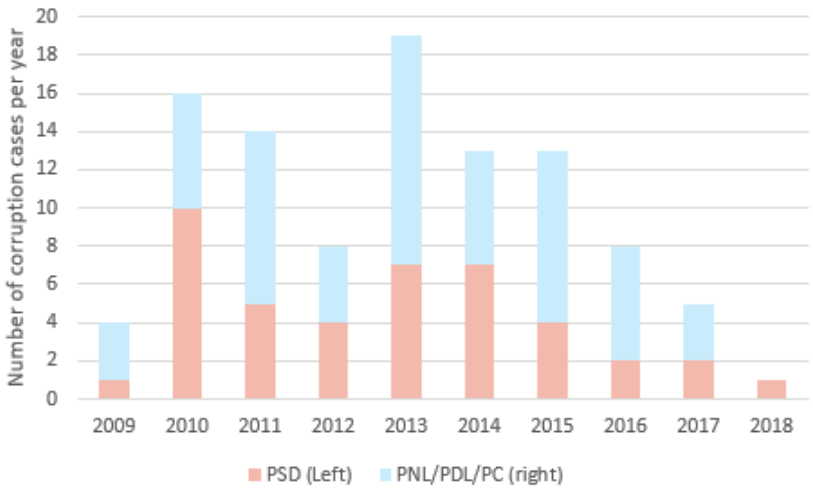
The World Bank (2013) defines corruption in public procurement as an action "[...] to steer the contract to the favoured bidder without detection [...] through, e.g., unjustified sole-sourcing or direct contracting awards; or favouring a specific bidder by tailoring specification, sharing inside information, etc." Public procurement processes rigged on a large scale, in turn, serve as strong indicators of grand corruption or even state capture:

[2] See: https://www.politico.eu/person/laura-codruta-kovesi/
[3] See: https://www.pna.ro/comunicate_condamnari.xhtml

Table 1: Overview of party affiliation of prosecuted politicians on the municipality level in Romania between 2009 and 2019, and national level ruling political party

Year	Prime minister	Left (PSD)	Right (PNL/PDL/PC)
2009	PDL	1	3
2010	PDL	10	6
2011	PDL	5	11
2012	PSD	4	4
2013	PSD	7	12
2014	PSD	7	6
2015	PSD	4	9
2016	IND	2	6
2017	PSD	2	3
2018	PSD	1	0
2019	PSD	0	0

Figure 1: Share of prosecuted politicians by party affiliation on the municipality level in Romania between 2009 and 2019



the transformation of the state in the service of rent-extraction by networks of individuals dominating both economic life and public office.

Our strategy for estimating the DNA's impact on corruption focuses on public procurement, and specifically, municipal level procurement practices. Municipalities were chosen as the most suitable level of analysis because, given their size, the prosecution of a high-level local official on corruption charges is unlikely to go unnoticed - thereby at least potentially constituting a strong deterrent to future wrongdoing. Procurement is an essential field of state activity: by one estimate costing Romania €38.6 billion or over 15% of its GDP each year – five times as much as the country spends on health care annually (Quintanilla et al., 2018). A significant portion of these resources comes from the EU in the form of European Structural and Investment (ESI) Funds allocations, which amounted to over €365 billion between 2004–2020 or 2.6% of the ten 'new' member states' GDP every year, including more than €30 billion to Romania in this period[4]. Corruption in government expenditure is highly significant in Europe (and globally) overall: approximately 15% of the EU's GDP is spent every year on procuring goods and services, and some estimates indicate that corruption increases the cost of government contracts by 20 - 25% (Mungiu-Pippidi, 2011).

The EU Public Procurement directives[5] regulate the publication of tenders in the EU. However, there are variations in the implementation across member countries. All EU public tenders are published in the "Supplement to the Official Journal of EU". These tenders are announced online through Tenders Electronic Daily (TED)[6]. The Opentender Project collects all tender announcements from 2009 to this date.[7] The data is structured by country, and we use the Opentender panel data set on public tenders from Romania. The data set of public procurement is extensive and contains more information than what we need to conduct our analysis. We clean the data to make sure that we minimise potential errors which can occur unless the data is structured correctly. Table 25 in the appendix reports the number of contracts we lose at each cleaning process step. Initially, we had 3 486 221 procurement contracts and ended up with 223 750 procurement contracts.

The second panel data set consists of all the DNA enforcement cases in Romania between 2009 and 2019. For every case that results in a guilty verdict in court, the DNA publishes a press release. These press releases contain data on who committed the crime, which function this person has in the private or public sector, what type of crime was committed, when the crime was committed, the content and size of the sanction, which DNA prosecution office conducted the investigation and prosecution, where geographically the crime was committed and more.[8] We have only extracted the cases where the convicted has a function on the municipality level, such as mayor, vice mayor or a public position related to the municipality. The filtering conducted in Table 25 results in the loss of the following number of municipalities, displayed in Table 2. For a complete overview of all municipalities with the municipality name, the dates for the corruption cases, and which municipalities are lost at each filtering step, see Table 26 in the appendix.

[4]See: https://cohesiondata.ec.europa.eu/countries/RO
[5]See: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32014L0024
[6]See: https://ted.europa.eu/TED/misc/aboutTed.do
[7]See: https://opentender.eu/ro/about/about-opentender
[8]See Section 9.1 in the appendix for the complete list of data extracted from the DNA press releases.

Table 2: The number of cities included in the study after different filtering steps

	Filtering steps	Number of cities left
1	Total number of cities with a corruption case between 2009 and 2019	128
2	Matched with procurement data	114
3	Removed Bucharest	113
4	Removed cities with less than 10 procurement contracts	42

4 Research approach

Corruption is a crime, and there is no registry documenting the corrupt transactions. However, there are ways to investigate corruption by creating directly observable proxy measures. Golden & Picci (2005) propose red flags in public procurement as a proxy for corruption. Other authors have followed suit and used various information from public procurement to estimate the risk of corruption. Notably, Auriol et al. (2011) measure exceptional procedure types, Hyytinen et al. (2007) use unclear scoring rules, and Fazekas et al. (2016) and Klašnja (2015) assess single bid contracts. We consider these objective proxy measures when we develop our proxies for corruption risk in public procurement in Romania. The proxies we use: "1) rests on a thorough understanding of the corrupt rent extraction process; 2) solely derives from objective data describing behaviour; 3) allows for consistent temporal comparisons within and across countries; and 4) can be replicated for many countries using pre-existing data" (Fazekas et al., 2016, p. 370).

We study five objectively observed red flags in public procurement as proxies of the risk of corruption. Table 4 describes the dependent variables we use as proxies. It is important to note that while the descriptions point to potential corruption risks related to these dependant variables, there are situations when it is legitimate to have a closed procedure, a short submission period, a tender call that is not published or a single bid contract. A shift in the dependant variables after the corruption case constitutes a proxy for a change in the risk of corruption.

The first proxy is procedure type, which indicates what kind of procurement procedure is applied when procuring a good or service. We classify procurement processes that have limited or no transparency as high risk. However, some goods and services require specific procurement procedures for legitimate reasons. For example, the acquisition of intelligence equipment to the army can be kept secret for valid reasons, requiring a restricted procedure type.

The second proxy is the time available for the submission of a bid. If this time window is short, there is an increased risk that only a limited number of bidders have the opportunity to place a bid. There is an increased risk that information about the bid requirements is shared before the tender is made public, favouring bidders who have the information, and can prepare a bid in time for the short submission deadline. There are situations where a short submission time is legitimate, such as emergencies or other unforeseen events requiring some

specific goods or services quickly.

The third proxy is whether or not the tender call is published on the official web pages of the European Union; Tender Electronic Daily.[9] If the tender is not published, transparency is limited, and the risk of corruption increases.

The fourth proxy is the use of single bid contracts, where the tender is directed towards one single supplier without competition. There are legitimate reasons for procuring goods and services from one single supplier. This can, for example, be the case when only one firm in the region can supply a certain good or service. Or urgency of the acquisition, such as a natural disaster or a pandemic, requires the tender process to deviate from regular procurement rules. However, we only study contracts of a certain size (value of >250 000 RON), which we assume under normal conditions are contracts that, in general, should be subject to competition. We, therefore, consider it to be a suitable proxy for an increased risk of corruption, as there is a higher likelihood that the contract allocation is distorted by corruption if there is only one single bidder.

The fifth proxy is a composite Corruption Risk Indicator (CRI) which is an indicator based on several red flags identified in the procurement contracts in our data set. The CRI was developed by Fazekas et al. (2016) and is based on a thorough analysis of potential risks that can be linked to the public procurement process. Variables in the indicator are either binary or continuous, where the sum of the individual variables represents the risk. The continuous variables are given thresholds that categorise the low or high risk of corruption. Table 5 contains a description of the variables included in the CRI.

[9]See: https://ted.europa.eu/TED/browse/browseByMap.do

Table 3: Overview of the municipalities included in the study and the corresponding date of the indictment corresponding to the corruption case

	Municipality	Corruption case
1	Calarasi	2009-06-16
2	Vidra	2009-07-20
3	Slatina	2009-11-04
4	Vaslui	2009-11-11
5	Calatele	2010-01-19
6	Negresti	2010-03-01
7	Craiova	2010-03-17
8	Ploiesti	2010-04-26
9	Constanta	2010-05-28
10	Deleni	2010-06-23
11	Galati	2010-09-13
12	Ramnicu Valcea	2010-10-20
13	Focsani	2011-02-16
14	Targoviste	2011-05-26
15	Hunedoara	2011-07-27
16	Bals	2011-12-12
17	Cluj Napoca	2011-12-22
18	Sipote	2012-08-06
19	Timisoara	2012-09-18
20	Gorban	2012-12-12
21	Berislavesti	2012-12-14
22	Pitesti	2012-12-14
23	Buzau	2013-07-11
24	Bragadiru	2013-09-27
25	Iasi	2013-11-29
26	Reghin	2013-12-05
27	Drobeta Turnu Severin	2014-03-27
28	Sibiu	2014-05-20
29	Bacau	2014-07-23
30	Mangalia	2014-12-02
31	Piatra Neamt	2015-03-23
32	Cetateni	2015-03-25
33	Maracineni	2015-03-25
34	Cristesti	2015-05-30
35	Resita	2015-12-11
36	Arad	2016-04-06
37	Miercurea Ciuc	2016-05-06
38	Alexandria	2016-07-15
39	Jilava	2016-10-28
40	Nucsoara	2016-12-12
41	Navodari	2016-12-19
42	Ghioroc	2017-04-28

Table 4: Description of dependant variables

	Variable	Variable type	Description
procedure	Non-open procedure	Binary variable	Limited transparency in procedure can favour certain suppliers. procedure = 1 if the procedure is considered to be of higher risk (Description of tender procedure: Procedure is negotiated, without negotiation or restricted). procedure = 0 if the procedure is considered to have low risk (Description of tender procedure: Open, competitive dialogue, design contest, approaching bidders, negotiated with publication, outright awards or other).
submission	Short submission period	Binary variable	Too short submission period can favour bidders that were aware of the upcoming tender call before its publication, or that knew the specifications of the tender before the tender call. submission = 1 if deadline for submission is between 2 and 32 days. submission = 0 if deadline for submission is between 33 and 365 days.
tendercall	No tender call	Binary variable	When the tender is not published, there is less transparency and less competition for the contract. tendercall = 1 if there is no url that links to the call for tender. tendercall = 0 if there is an url that links to the call for tender.
singleb	Single bid	Binary variable	When a contract is directed towards one single bidder, the tender specification can be tailored to suit only one bidder, or the potential bidder can collude on who submits a bid. singleb = 1 if there is only one bidder. singleb = 0 if there is more than one bidder.
cri_ro	Corruption Risk Indicator	Discretionary variable	Composite indicator of the risk of corruption in public procurement, which incorporates the dependant variables described in this table, including more variables which are presented in Table 5. Continuous score between [0;1] where 0 = low risk and 1 = high risk.

Table 5: The content of the Corruption Risk Indicator

Indicator	Explanation	Interpretation
Single bid	The contract is directed towards a specific supplier without competition.	Low risk = multiple bidders High risk = one bidder
Procedure type	The tender procedure is affiliated with increased risk of corruption, e.g., emergency procurement.	Low risk = open procedure Medium risk = restricted negotiation High risk = negotiated without publication
Submission period	The time frame of submitting a bid for the tender call is either short or normal.	Low risk = 33 - 365 days High risk = 2 - 32 days
Decision period	The time frame for concluding the procurement risk is either short, medium long, or long.	Low risk = 61 - 365 days Medium risk = 32 - 60 days High risk = 0 - 31 days
Call for tender published	The tender call was not published.	Low risk = not missing tender url High risk = missing tender url
Tax haven	The bidder is linked to a tax haven where 0 indicates local suppliers, 1 is a foreign supplier not located in a tax haven, and 2 is a foreign supplier located in a tax haven.	Low risk = value <= 59.5 High risk = value > 59.5
Buyer dependence on supplier	The specific supplier is receiving an artificially high number of tenders from one buyer. Referring to the monetary share of the buyer's contracts won by the same supplier per year.	Discretionary input variable between [0;1]. A value of 0.4 means that 40% of the buyer's purchases were from that particular supplier.
Benford's law	Analyse patterns to detect potential fraudulent behaviour.	Low risk = value [0.0019 - 0.0203] High risk = value [0.0204 - 0.1219]

Note: See Tödter (2009) for further explanation of Benford's law.

5 Analysis

From theory on crime deterrence, we know that theoretically, an actual or perceived increase in the risk of detection reduces an individual's inclination to commit a crime. The theoretical consequence of a revealed corruption case is a decrease in the risk of corruption, given that the population becomes aware of the case and considers the case to increase the risk of being caught for corruption. In this section, we first present the relationship between a corruption case and the risk of corruption that we seek to identify. Next, we present the results from the unmatched and matched comparison. Finally, we analyse the implications of these results to evaluate the impact of the corruption cases brought by the DNA on the risk of corruption in public procurement on the municipality level in Romania.

5.1 Causal identification of indictment on the risk of corruption in public procurement

Can we identify a causal relationship between a corruption case and the risk of corruption in public procurement? Hume's three criteria for causal inference are (1) spatial/temporal contiguity that A (corruption case) and B (change in corruption risk in public procurement) are contiguous in space and time, (2) temporal succession: A precedes B in time, and (3) constant conjunction: A and B always occur (or do not occur) together (Holland, 1986).

To identify a causal relationship we must address the following concerns: First, the date of the indictment can deviate from the date of when the news of the corruption case became public. This leads to some uncertainty regarding the complete exogenous effect of the corruption case. Second, a change in corruption risk can occur without a corruption case, and a corruption case can be a cause without an effect. Third, we only study treated municipalities, without an untreated control group.

We take the following measures to address the criteria for causality and the concerns presented above: When we merge the two data sets, we merge on municipality names enabling us to combine the corruption cases with the public procurement contracts of the same municipality. This ensures that we only compare procurement contracts contiguous in space and time of the corruption case. We only study proxies of corruption risk in the municipality where the corruption case happened. We have filtered out all corruption cases at a national level, as the contiguity is harder to establish when the case is at the national level, while we search for the effect on a local level. We limit our analysis to only one case per municipality. Most municipalities only have one corruption case, while a few, typically larger cities, have multiple cases.

We briefly review Romania's general trend in corruption risk to address the challenge of not having an untreated control group. An untreated control group can control for general trends in both the treated and untreated groups. As for now, we cannot rule out these general trends. As there is some uncertainty regarding the timing of the corruption case, we assume that the date of the indictment is the best fit for an exogenous shock. Further, to infer a relationship between a corruption case and the risk of corruption, we conduct our analysis in two stages — first, an unmatched comparison of the dependant variables before and after treatment;

Table 6: Variables used in the coarsened exact matching

Variable	Description
Contract month	Matches contracts on the time of the year the contract is awarded.
Buyer region	Matches contracts based on the region of the buyer, at the NUTS (Nomenclature of territorial units for statistics) level 3.
Industry (CPV)	Matches contracts within the same industry based on the two first digits of the CPV (Common Procurement Vocabulary) code.
Buyer county	Matches contracts on the county level, NUTS level 2.
Contract value	Matches contracts on the final price of the contract paid by the procurer.
Buyer type	Matches contracts on the type of buyer; regional authority, regional agency, public body, utilities or others.

Note: For NUTS see: Eurostat overview of regions and cities. For CPV see: Regulation (EC) No 2195/2002 of the European Parliament and of the Council of 5 November 2002 on the Common Procurement Vocabulary (CPV)

second, a matched comparison before and after treatment. The unmatched comparison only provides limited evidence of the causes of the potential change after the treatment. We, therefore, apply Coarsened Exact Matching (CEM) developed by Iacus et al. (2011) that approximates a fully blocked experiment. This method matches procurement contracts from the group of treated contracts, with contracts from the group of untreated contracts, within the same municipality. The CEM procedure conducts an exact matching of contracts based on the variables listed in Table 6. The matching is done by temporally coarsening variables and minimising imbalance between the treatment and control groups. See appendix Section 9 for descriptive statistics for the dependant variables for both the matched and unmatched groups. A descriptive overview of the input variables of the analysis is presented in Table 7.

5.2 Descriptive statistics

As an initial step, we present a descriptive overview of the development of the five dependent variables. Table 8 shows the aggregated share of contracts with non-open procedure, short submission period, no tender call published and single bid, relative to the total number of contracts. This is across all municipalities studied, from three years before the corruption case, until three years after the corruption case. Figure 2 displays the development of the monthly mean of the CRI for all municipalities studied, where we note an indication of a decrease after the corruption case. The blue dotted line indicates the corruption case at year = 0.

5.3 Unmatched comparison

To further investigate the effect of a corruption case on the risk of corruption in public procurement, we conduct an unmatched comparison of the treated and the untreated procurement contracts. All procurement contracts awarded before the corruption case are labelled untreated, and those awarded after the corruption case are

Table 7: Description of input variables

	Variable	Variable type	Description
log_price	Contract value	Discretionary input	The logarithmic price paid by the buyer for the procurement contract.
domestic	Domestic	Binary input	Binary variable indicating if the bidding firm is registered in Romania (1) or registered abroad (0).
buyer_buyertype	Type of buyer	Non-discretionary input	Factor variable categorising the different types of buyers. Contains: "Regional authority", "Regional agency", "Public body", "Utilities" or "Other".
contract_month	Contract month	Non-discretionary input	Factor variable indicating the month the contract was awarded, takes values of 1 to 12.
buyer_nuts4	Buyer region (NUTS2)	Non-discretionary input	Factor variable indicating the region where the buyer is located. NUTS level 2.
tender_cpvs	Industry (CPV)	Non-discretionary input	Business sector CPV takes the two first digits of the CPV code to indicate the industry from where the procured product of service belongs e.g., agriculture or education.
buyer_post2	Buyer county (NUTS3)	Non-discretionary input	Factor variable indicating the county where the buyer is located. NUTS level 3.

Table 8: The share of red flag contracts three years before and after the corruption case

Years from treatment	Non-open procedure	Open procedure	Total N	Non-open procedure ratio (NOP/N)
-3	277	20671	20948	0.013
-2	217	25894	26111	0.008
-1	442	32899	33341	0.013
1	435	41104	41539	0.010
2	543	51244	51787	0.010
3	654	49370	50024	0.013

Years from treatment	Short submission	Not short submission	Total N	Short submission ratio (SS/N)
-3	97	5401	5498	0.017
-2	18	7559	7577	0.002
-1	49	9505	9554	0.005
1	820	12065	12885	0.064
2	1168	17358	18526	0.063
3	639	15476	16115	0.040

Years from treatment	No tender call	Published tender call	Total N	No tender call ratio (NTC/N)
-3	5370	15578	20948	0.256
-2	7429	18682	26111	0.284
-1	9355	23986	33341	0.280
1	13043	28496	41539	0.314
2	19188	32599	51787	0.370
3	17352	32672	50024	0.347

Years from treatment	Single bid	Not Single bid	Total N	Single bid ratio (SB/N)
-3	280	2231	2511	0.111
-2	577	3665	4242	0.136
-1	670	3593	4263	0.157
1	1014	6155	7169	0.141
2	1704	6807	8511	0.200
3	1436	5186	6622	0.217

Figure 2: Monthly mean of the CRI for all cases in a window of three years before and after a corruption case

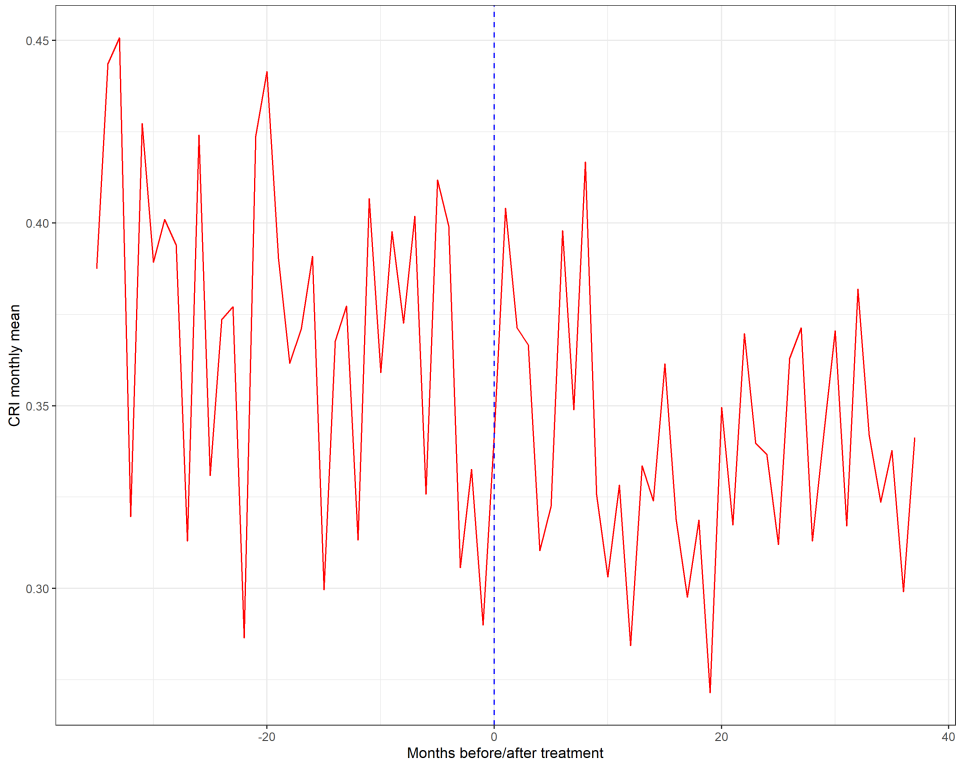


Table 9: After - before T-test results for all dependant variables. Unmatched data

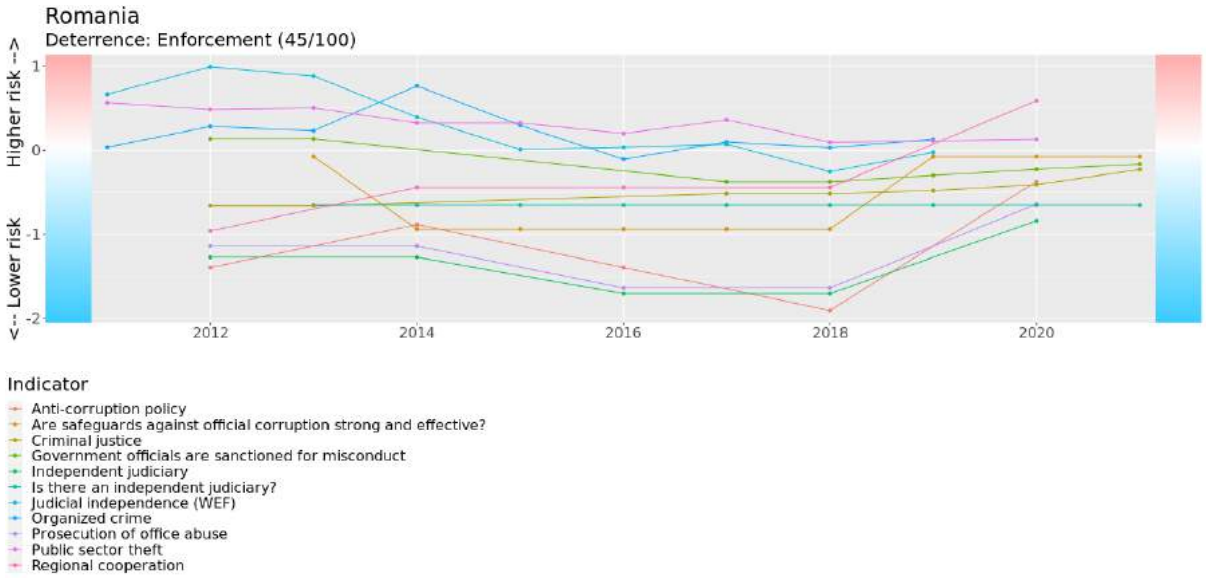
Window size	Non-open procedure	Short submission period	No tender call	Single bid	CRI
1 year	−0.0031	0.0403**	−0.074**	0.0067	−0.0114***
	(−0.87)	(2.67)	(−2.25)	(0.25)	(−8.45)
2 years	−0.0006	0.0482**	−0.068**	−0.0043	−0.0218***
	(−0.27)	(2.35)	(−2.24)	(−0.19)	(−22.1)
3 years	−0.0012	0.0372	−0.048	−0.0190	−0.0246***
	(−0.58)	(1.20)	(−1.49)	(−0.77)	(−29.6)

Note: $^{*}p < 0.1;^{**}p < 0.05;^{***}p < 0.01$. T-value in brackets.

labelled as treated. For the estimate of the t-test, we calculate the after treatment mean subtracted by the before treatment mean to investigate the direction of the shift of the mean after the corruption case.

The results of the unmatched t-test are presented in Table 9. We investigate if there is a shift in the dependant variables on the one-year short term, to investigate the more immediate effect of the corruption case and up to three years before and after to investigate the more lasting effects. The use of non-open procedures decreases, but the results are insignificant. The use of short submission periods increases significantly by 4-4.8% in the one and two-year windows, respectively. Significance disappears in the three-year window. The absence of a public tender call decreases significantly in the one and two-year windows by 7.4 and 6.8%, respectively. The impact on single bid contracts is a slight, however insignificant, increase one year after the corruption case. In the two and three-year comparison, the share of single bid contracts decreases, but the results are still insignificant. The results on the CRI return a significant decrease in the one, two, and three-year windows. The

Figure 3: Development of the risk of corruption related to law enforcement in Romania



Source: TRACE International

effect is increasing yearly, from a reduced risk of corruption of 1.1% in year one to a 2.2% reduction in year two and a 2.5% reduction in year three.

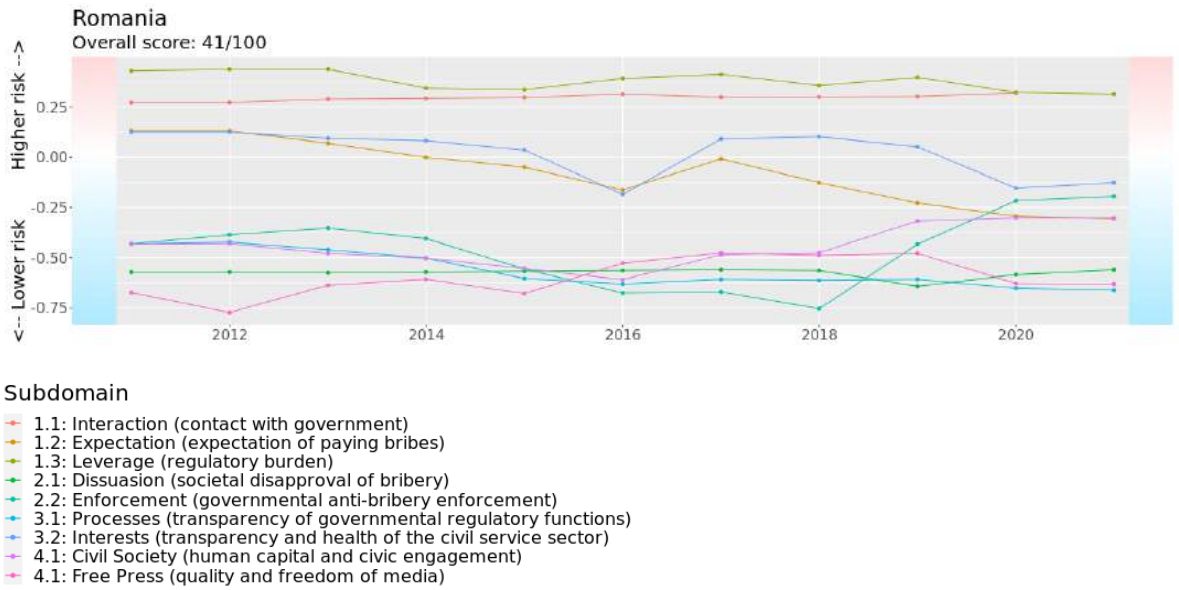
The t-test on the unmatched data is the starting point of our reasoning on the effect of the corruption case brought by the DNA on the risk of corruption in public procurement. Before we move to the regression analysis, it is worthwhile looking at the general development of the risk of corruption in Romania. We include this general development to rule out any large overall shifts in the risk of corruption. It is relevant to control for any major development in the overall risk of corruption in Romania. We investigate this general risk by first looking at the general development of corruption risk in the law enforcement sector, and the overall risk of corruption in Romania. To investigate this development, we use the TRACE International Bribery Risk Matrix data.[10] In Figure 3, we see a general development in the risk of corruption in law enforcement that is quite stable throughout the whole time period that we study, from 2009 to 2019. An increase in the table represents a heightened risk of corruption. In recent years, the independence of the judiciary and public sector theft have increased in risk. Also, the safeguards against official corruption have been weakened.

The development of the overall risk of corruption in Romania (see Figure 4) tends towards the same conclusion, where the development is rather stable. Figure 3 is one of the subdomains (nr 2.2) of the overall development from Figure 4. Similar to the previous figure is that an increase in the reported values of the subdomains represents an increase in the risk of corruption. The increase in the enforcement subdomain is what drives the increase in risk that is most notable in Figure 4, and the other subdomains remain stable. Besides, the score given to Romania in the Transparency International Corruption Perception Index has remained unchanged since 2012.[11] We can therefore continue our investigation into the relationship between the cases brought by the DNA and the corruption risk in public procurement, well aware that the chance of any very impactful changes

[10]See the TRACE Bribery Risk Matrix methodology report for a detailed description of the content of the matrix: https://www.traceinternational.org/trace-matrix

[11]See: https://www.transparency.org/en/cpi/2020/index/rou

Figure 4: Development of the overall risk of corruption in Romania



Source: TRACE International

related to the overall corruption risk in Romania and the Romanian law enforcement remains low. We include several controls in our regression analysis to pick up several of these potential general developments.

The next step in our analysis is to run regressions to isolate the effect of the corruption case on the dependant variables while also investigating other independent variables that potentially influence the dependant variables and controlling for a variety of fixed effects. The regular process of public procurement takes some time, and we do not expect the effect of a corruption case to materialise immediately, as the treatment will only influence procurement contracts that start after the treatment, or that are in an early stage at the time of the treatment. For the regression analysis, we, therefore, consider the two or three-year windows. This is supported by the initial t-test, where the impact on the CRI was increasing over time. For our main analysis, we include contracts on the three-year window, meaning that all procurement cases in the time period of three years before and after the corruption case are included in the regression analysis. We include a summary of the matched and unmatched regression results with a two-year window in the appendix, see Section 8.2.

Table 10 presents an overview of the regression results for all the dependent variables. The stepwise regression tables for each dependent variable can be found in Section 8.1 in the appendix. The dependant variables non-open procedure, short submission period, no tender call and single bid are all binary variables where we apply a logistic fixed-effects model. The CRI is a continuous variable and we apply a linear fixed-effects model. The logistic fixed-effects regression reports coefficients in average marginal effects, meaning that the coefficient reported represents the percentage increase in the dependant variable, as a result of a marginal increase of one unit in the independent variable. The use of the four binary dependant variables can, as mentioned earlier, stem from completely legitimate reasons. However, everything else equal, we do not expect a change in these dependant variables unless there is a shift in either the demand for products and services, or a shift in behaviour, meaning that the same products and services are procured, but the procurement process has changed.

In Table 10, we present the full regression model, where all independent and control variables are included

Table 10: Summary of regressions all dependant variables. Unmatched data

	Non-open procedure	Short submission period	No tender call	Singel bid	CRI
Treatment (3 years)	-0.001	0.025*	-0.091***	0.010**	-0.029***
	(0.002)	(0.013)	(0.028)	(0.005)	(0.010)
Contract value	-0.004***	0.001	0.000	-0.004***	-0.005
	(0.001)	(0.001)	(0.013)	(0.001)	(0.005)
Domestic	0.012***	-0.006	0.182***	0.071***	0.052***
	(0.004)	(0.006)	(0.020)	(0.007)	(0.011)
Other	-0.008	0.009*	-0.371***	0.019**	-0.142***
	(0.005)	(0.005)	(0.076)	(0.008)	(0.029)
Public body	-0.010**	-0.002	-0.216***	-0.005	-0.122***
	(0.005)	(0.004)	(0.062)	(0.008)	(0.032)
Regional agency	-0.006	0.000	0.017	-0.016**	-0.015
	(0.009)	(.)	(0.053)	(0.006)	(0.020)
Utilities	0.174***	0.246*	-0.830***	0.058***	-0.246***
	(0.048)	(0.143)	(0.033)	(0.020)	(0.041)
Constant					0.448***
					(0.062)
Control Variables					
Contract month	Yes	Yes	Yes	Yes	Yes
Buyer region (NUTS2)	Yes	Yes	Yes	Yes	Yes
Industry (CPV)	Yes	Yes	Yes	Yes	Yes
Buyer county (NUTS3)	Yes	Yes	Yes	Yes	Yes
N	220913	209436	221181	221161	221623

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

in the regression model. The effect of the treatment on the non-open procedure is insignificant. The probability that a contract has a short submission period or that the contract is a single bid significantly increases by 2.5% and 1%, respectively, after treatment. The probability that a tender call is not made public and the marginal effect of the treatment on the CRI is a significant decrease of 9.1% and 2.9%, respectively. If the winning firm is a Romanian national firm, indicated by the binary variable "Domestic", the CRI significantly increases by 5.2%. The contract value has an insignificant influence on the CRI. As the value of the contract increases, the probability of a contract having a non-open procedure and that the contract is single bid decreases by 0.4%. "Other", "Public body", "Regional agency", "Regional authority" and "Utilities" represent the type of buyer-classification of the institutions procuring goods and services. The regional authority is the baseline. The regression results show that the other types of buyers all have a significant (except regional agency) decreasing effect on the CRI. We can interpret this as regional authorities being the type of buyer linked to the highest risk of corruption. All regression models included in the table control for contract month, buyer region, industry and buyer county.

The unmatched comparison does not isolate the effect of changes in behaviour linked to public procurement. The change in the dependant variables can stem from both changes in behaviour and changes in the composition of goods and services procured. We want to isolate the effect of the behaviour of the public procurers, and if their practice of procuring goods and services changes after corruption cases. The matched comparison we turn to next enables us to control for the change in demand and isolate the effect on behaviour.

5.4 Matched comparison

To further investigate the relationship between a corruption case at the municipality level and the risk of corruption in public procurement, we use coarsened exact matching, explained in Section 5.1, to simulate a control group that consists of the same buyers in both the treatment and control groups. We match similar contracts in the same municipality before and after the corruption case. We match on the following variables: contract month, buyer region, industry, buyer county, contract value, and buyer type. It is reasonable to believe that the municipalities will continue to purchase many of the same kinds of goods and services on an aggregated level regardless of the corruption case. However, the CEM enables us to make sure that we only compare similar contracts before and after the treatment. A shift in the dependant variables will then indicate a change in behaviour from the procurement agents when procuring the same types of goods and services. For the t-test, we calculate the after treatment mean subtracted by the before treatment mean, to investigate the direction of the change after the corruption case.

In Table 11, a summary of the t-test on the matched data is presented. The use of non-open procedure significantly decreases by 0.13% on the one-year window and 0.007% on the two-year window. The three-year window returns an insignificant change. The use of short submission period is significantly increasing in years one, two and three by 0.085%, 0.0036% and 0.0020%, respectively. The lack of tender calls published online is significantly decreasing in all three time periods, by 1.56% in year one, 1.18% in year two and 0.77% in year

Table 11: After - before T-test results for all dependent variables. Matched data

Window size	Non-open procedure	Short submission period	No tender call	Single bid	CRI
1 year	-0.0013^{**}	0.0085^{***}	-0.0156^{***}	0.0014	-0.0135^{***}
	(-2.17)	(10.5)	(-5.41)	(1.59)	(-11.0)
2 years	-0.0007^{*}	0.0036^{***}	-0.0118^{***}	0.0013^{**}	-0.0066^{***}
	(-1.86)	(7.23)	(-6.37)	(2.16)	(-8.03)
3 years	-0.0004	0.0020^{***}	-0.0077^{***}	0.0007	-0.0043^{***}
	(-1.25)	(5.42)	(-5.15)	(1.54)	(-6.45)
Matching variables					
Contract month	Yes	Yes	Yes	Yes	Yes
Buyer region (NUTS3)	Yes	Yes	Yes	Yes	Yes
Industry (CPV)	Yes	Yes	Yes	Yes	Yes
Buyer country (NUTS2)	Yes	Yes	Yes	Yes	Yes
Contract value	Yes	Yes	Yes	Yes	Yes
Buyer type	Yes	Yes	Yes	Yes	Yes

Note: $^{*}p < 0.1;^{**}p < 0.05;^{***}p < 0.01$. T-values in brackets.

three. The share of single bid contracts increases after the treatment, however only significantly in the two-year window, where the increase is 0.13%. There is a significant decrease in CRI in the one-year comparison of 1.35%, a decrease of 0.66% in the two-year comparison, and a 0.43% decrease in the three-year comparison. The effect is now decreasing over time, the opposite of what we saw in the unmatched t-test in Table 11.

Table 12 presents the summary of the regression models on the matched data. We use the same models and conduct the regression in the same stepwise manner as in the unmatched regression analysis. See Section 8.1 in the appendix for the individual regression results for each dependant variable. The effect of the treatment on the use of non-open procedures is insignificant. The use of a short submission period and single bid increases significantly by 2.7% and 0.8%, respectively, after treatment. The absence of published tender calls and the CRI decreases by 8.8% and 2.8%, respectively, after treatment. The independent variables influence the dependant variables in the same manner as in the unmatched regression analysis. Where a Romanian national firm will significantly increase the CRI, the contract value is insignificant, and the regional authority is still related to the highest corruption risk among the types of buyers.

Table 12: Summary of regressions all dependent variables. Matched data

	Non-open procedure	Short submission period	No tender call	Singel bid	CRI
Treatment (3 years)	-0.001	0.027*	-0.088***	0.008*	-0.028**
	(0.002)	(0.014)	(0.028)	(0.005)	(0.012)
Contract value	-0.004***	0.001	-0.001	-0.003**	-0.007
	(0.001)	(0.001)	(0.013)	(0.001)	(0.006)
Domestic	0.011***	-0.006	0.184***	0.069***	0.047***
	(0.004)	(0.006)	(0.019)	(0.007)	(0.016)
Other	-0.007	0.010**	-0.385***	0.018**	-0.148***
	(0.005)	(0.005)	(0.076)	(0.009)	(0.029)
Public body	-0.009**	-0.001	-0.226***	-0.006	-0.102***
	(0.005)	(0.004)	(0.063)	(0.008)	(0.028)
Regional agency	-0.008	0.000	0.009	-0.016***	-0.027
	(0.008)	(.)	(0.054)	(0.006)	(0.021)
Utilities	0.152***	0.180	-0.852***	0.083***	-0.266***
	(0.036)	(0.123)	(0.030)	(0.022)	(0.034)
Constant					0.486***
					(0.062)
Control Variables					
Contract month	Yes	Yes	Yes	Yes	Yes
Buyer region (NUTS2)	Yes	Yes	Yes	Yes	Yes
Industry (CPV)	Yes	Yes	Yes	Yes	Yes
Buyer county (NUTS3)	Yes	Yes	Yes	Yes	Yes
N	212047	202070	212131	212135	154558

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

6 Discussion

From the theory on deterrence, we know that efficient law enforcement can influence the actual probability of detection and the perceived probability of detection. The result of an actual or perceived increase in detection will theoretically lead to a decrease in crime rates. Our dependant variables represent a proxy of the corruption risk in public procurement. We should therefore see a decrease in the risk of corruption in public procurement if the cases brought by the DNA have an effect on the (actual or perceived) probability of detection.

Both the unmatched and matched analyses show a general decrease in corruption risk in public procurement, following a corruption case brought by the DNA. At first glance, this is the expected effect according to theory on deterrence if the DNA is efficient in the enforcement of the Romanian anti-corruption laws. Before we reflect on some ambiguities in the interpretation of the results, we conclude that, in general, the risk of corruption in public procurement in Romania on the local level becomes significantly lower following a corruption case brought by the DNA.

However, if we take a closer look at the different proxies for corruption risk and what potential risk they represent, the interpretation of the results is more nuanced. The overall measure of corruption risk, the CRI, is significantly decreasing, so is the lack of tender calls and the use of non-open procedures. The use of short submission periods and single bid contracts are slightly increasing. Our interpretation is that procedure type and the publication of tender calls are related to more formal compliance with the procurement rules. Meaning that as a procurement officer, one can check the boxes of publishing the tender call, and choose a low-risk procedure, while still utilising short submission periods and single bid contracts, enabling the corrupt procurement agents to act corruptly.

The consequence of better formal compliance is twofold. First, if the effect of the corruption case is partially limited to better compliance with formal rules of procurement, this can be a step in the right direction if these procedures at some point result in reducing corruption. Second, better formal compliance can be limited to just better formal compliance, which means that when a corruption case is enforced, the procurement officer makes some changes that look like an improvement, while at the same time maintaining elements of high risk procurement.

The effect of a corruption case on the risk of corruption is decreasing over time. This can be the result of a gradually decreasing perceived risk of detection as the distance in time from the corruption case increases. This emphasises the importance of maintaining a presence of control from law enforcement also after the corruption case is concluded.

Regional authorities are the type of buyer associated with the highest risk of corruption in public procurement. Regional authorities are counties or municipalities. It is a concern that relative to other types of buyers, municipalities and counties are associated with the highest risk of corruption in public procurement.

The support for introducing and maintaining an ACA is a result of opposing forces. Our finding of a descriptively higher share of opposition politicians among the convicted population raises concerns regarding the DNA's independence. However, the results are uncertain and we can only stress the importance of continuous

efforts in maintaining the integrity and independence of the DNA.

7 Conclusion

We provide empirical evidence of a reduction in the overall risk of corruption based on the work done by the DNA, the Romanian ACA. Our findings show that a corruption case increases the formal compliance of procedure rules in public procurement. At the same time, there is an increase in certain types of contracts that are associated with higher risk of corruption. After a corruption case, there is an increase in short submission periods and in single bid contracts, but the effect on the lack of published tender calls and the CRI is significantly negative. We can interpret this as an improvement in the formal compliance with procurement regulation after a corruption case. Limited evidence points at more law enforcement efforts are directed towards politicians from opposition parties. We find that regional authorities, such as municipalities and counties, are associated with the highest risk of corruption among the different types of public buyers. Finally, we find that the effect of a corruption case on the risk of corruption decreases over time, emphasising the importance of maintaining law enforcement presence, and continuous preventive efforts.

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8 Appendix

8.1 Full regression tables for all dependant variables

Table 13: Logistic FE model regression on Non-open procedure. Unmatched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	-0.000	-0.000	-0.002	-0.001	-0.001
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Contract value		-0.004***	-0.004***	-0.004***	-0.004***
		(0.001)	(0.001)	(0.001)	(0.001)
Domestic			0.014***	0.012***	0.012***
			(0.004)	(0.004)	(0.004)
Other				-0.008	-0.008
				(0.005)	(0.005)
Public body				-0.010**	-0.010**
				(0.005)	(0.005)
Regional agency				-0.006	-0.006
				(0.009)	(0.009)
Utilities				0.174***	0.174***
				(0.047)	(0.048)
Control Variables					
Contract month		Yes	Yes	Yes	Yes
Buyer region (NUTS3)			Yes	Yes	Yes
Industry (CPV)				Yes	Yes
Buyer county (NUTS2)					Yes
N	223750	223750	223749	221313	220913

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 14: Logistic FE model regression on Non-open procedure. Unmatched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	0.027	0.026	0.024*	0.025*	0.025*
	(0.026)	(0.019)	(0.014)	(0.013)	(0.013)
Contract value		0.002	0.001	0.001	0.001
		(0.003)	(0.001)	(0.001)	(0.001)
Domestic			-0.006	-0.006	-0.006
			(0.006)	(0.006)	(0.006)
Other				0.009*	0.009*
				(0.005)	(0.005)
Public body				-0.002	-0.002
				(0.004)	(0.004)
Regional agency				0.000	0.000
				(.)	(.)
Utilities				0.250*	0.246*
				(0.146)	(0.143)
Control Variables					
Contract month		Yes	Yes	Yes	Yes
Buyer region (NUTS3)			Yes	Yes	Yes
Industry (CPV)				Yes	Yes
Buyer county (NUTS2)					Yes
N	223750	223750	223749	209833	209436

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 15: Logistic FE model regression on Non-open procedure. Unmatched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	-0.022*	-0.016	-0.027**	-0.021*	-0.024**
	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)
Price (log)		-0.010**	-0.010*	-0.008	-0.004
		(0.005)	(0.005)	(0.006)	(0.007)
Domestic			0.059***	0.051***	0.054***
			(0.016)	(0.016)	(0.015)
Other				-0.121***	-0.131***
				(0.034)	(0.033)
Public body				-0.084***	-0.115***
				(0.030)	(0.035)
Regional agency				-0.007	-0.013
				(0.022)	(0.021)
Utilities				-0.234***	-0.239***
				(0.045)	(0.040)
Constant	0.353***	0.490***	0.409***	0.456***	0.420***
	(0.018)	(0.066)	(0.066)	(0.073)	(0.078)
r2	0.003	0.032	0.120	0.225	0.261
N	152746	152746	152746	151676	151426

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 16: Logistic FE model regression on Single Bid. Unmatched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	0.011*	0.011**	0.010**	0.010**	0.010**
	(0.006)	(0.006)	(0.004)	(0.005)	(0.005)
Contract value		-0.003***	-0.005***	-0.004***	-0.004***
		(0.001)	(0.001)	(0.001)	(0.001)
Domestic			0.072***	0.071***	0.071***
			(0.007)	(0.007)	(0.007)
Other				0.019**	0.019**
				(0.008)	(0.008)
Public body				-0.005	-0.005
				(0.008)	(0.008)
Regional agency				-0.015**	-0.016**
				(0.006)	(0.006)
Utilities				0.058***	0.058***
				(0.020)	(0.020)
N	223750	223750	223749	221562	221161

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 17: Linear model fixed effects regression on CRI. Unmatched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	-0.025*	-0.021*	-0.034***	-0.030***	-0.029***
	(0.013)	(0.012)	(0.011)	(0.010)	(0.010)
Contract value		-0.010**	-0.010**	-0.007	-0.005
		(0.004)	(0.004)	(0.005)	(0.005)
Domestic			0.059***	0.051***	0.052***
			(0.012)	(0.013)	(0.011)
Other				-0.119***	-0.142***
				(0.027)	(0.029)
Public body				-0.080***	-0.122***
				(0.027)	(0.032)
Regional agency				-0.001	-0.015
				(0.015)	(0.020)
Utilities				-0.231***	-0.246***
				(0.044)	(0.041)
Constant	0.359***	0.491***	0.418***	0.461***	0.448***
	(0.014)	(0.056)	(0.053)	(0.057)	(0.062)
r2	0.004	0.025	0.097	0.205	0.238
N	223750	223750	223749	222029	221623

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 18: Logistic FE model regression on non open procedure. Matched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	-0.000	-0.000	-0.002	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Contract value		-0.004***	-0.004***	-0.004***	-0.004***
		(0.001)	(0.001)	(0.001)	(0.001)
Domestic			0.013***	0.011***	0.011***
			(0.004)	(0.004)	(0.004)
Other				-0.007	-0.007
				(0.005)	(0.005)
Public body				-0.009**	-0.009**
				(0.005)	(0.005)
Regional agency				-0.008	-0.008
				(0.008)	(0.008)
Utilities				0.152***	0.152***
				(0.036)	(0.036)
Control Variables					
Contract month		Yes	Yes	Yes	Yes
Buyer region (NUTS3)			Yes	Yes	Yes
Industry (CPV)				Yes	Yes
Buyer county (NUTS2)					Yes
N	213570	213570	213570	212442	212047

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 19: Logistic FE model regression on short procedure period. Matched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	0.031	0.029	0.027*	0.027*	0.027*
	(0.029)	(0.020)	(0.014)	(0.014)	(0.014)
Contract value		0.003	0.001	0.001	0.001
		(0.003)	(0.001)	(0.001)	(0.001)
Domestic			-0.006	-0.006	-0.006
			(0.006)	(0.006)	(0.006)
Other				0.010**	0.010**
				(0.004)	(0.005)
Public body				-0.001	-0.001
				(0.004)	(0.004)
Regional agency				0.000	0.000
				(.)	(.)
Utilities				0.181	0.180
				(0.124)	(0.123)
Control Variables					
Contract month		Yes	Yes	Yes	Yes
Buyer region (NUTS3)			Yes	Yes	Yes
Industry (CPV)				Yes	Yes
Buyer county (NUTS2)					Yes
N	213570	213570	213570	202461	202070

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 20: Logistic FE model regression on no tender call. Matched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	-0.073***	-0.069***	-0.106***	-0.087***	-0.088***
	(0.025)	(0.024)	(0.023)	(0.028)	(0.028)
Contract value		-0.002	-0.004	-0.002	-0.001
		(0.011)	(0.012)	(0.013)	(0.013)
Domestic			0.209***	0.183***	0.184***
			(0.023)	(0.020)	(0.019)
Other				-0.385***	-0.385***
				(0.076)	(0.076)
Public body				-0.225***	-0.226***
				(0.063)	(0.063)
Regional agency				0.012	0.009
				(0.053)	(0.054)
Utilities				-0.852***	-0.852***
				(0.030)	(0.030)
Control Variables					
Contract month		Yes	Yes	Yes	Yes
Buyer region (NUTS3)			Yes	Yes	Yes
Industry (CPV)				Yes	Yes
Buyer county (NUTS2)					Yes
N	213570	213570	213570	212523	212131

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 21: Logistic FE model regression on Single Bid. Matched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	0.027	0.026	0.024*	0.025*	0.025*
	(0.026)	(0.019)	(0.014)	(0.013)	(0.013)
Contract value		0.002	0.001	0.001	0.001
		(0.003)	(0.001)	(0.001)	(0.001)
Domestic			-0.006	-0.006	-0.006
			(0.006)	(0.006)	(0.006)
Other				0.009*	0.009*
				(0.005)	(0.005)
Public body				-0.002	-0.002
				(0.004)	(0.004)
Regional agency				0.000	0.000
				(.)	(.)
Utilities				0.250*	0.246*
				(0.146)	(0.143)
Control Variables					
Contract month		Yes	Yes	Yes	Yes
Buyer region (NUTS3)			Yes	Yes	Yes
Industry (CPV)				Yes	Yes
Buyer county (NUTS2)					Yes
N	223750	223750	223749	209833	209436

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 22: Linear model fixed effects regression on CRI. Matched data

	(1)	(2)	(3)	(4)	(5)
Treatment (3 years)	-0.000	-0.000	-0.002	-0.001	-0.001
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Contract value		-0.004***	-0.004***	-0.004***	-0.004***
		(0.001)	(0.001)	(0.001)	(0.001)
Domestic			0.014***	0.012***	0.012***
			(0.004)	(0.004)	(0.004)
Other				-0.008	-0.008
				(0.005)	(0.005)
Public body				-0.010**	-0.010**
				(0.005)	(0.005)
Regional agency				-0.006	-0.006
				(0.009)	(0.009)
Utilities				0.174***	0.174***
				(0.047)	(0.048)
Control Variables					
Contract month		Yes	Yes	Yes	Yes
Buyer region (NUTS3)			Yes	Yes	Yes
Industry (CPV)				Yes	Yes
Buyer county (NUTS2)					Yes
N	223750	223750	223749	221313	220913

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

8.2 Regressions with a 2-year window for procurement cases, matched and unmatched

Table 23: Summary of regressions. 2-year time window. Unmatched data

	Non-open procedure	Short submission period	No tender call	Singel bid	CRI
Treatment (2 years)	-0.001	0.070*	-0.066**	0.035	-0.024**
	(0.002)	(0.042)	(0.032)	(0.024)	(0.010)
Contract value	-0.003**	0.013	0.001	-0.006	-0.004
	(0.002)	(0.009)	(0.016)	(0.005)	(0.007)
Domestic	0.012***	-0.000	0.179***	-0.046***	0.054***
	(0.004)	(0.002)	(0.024)	(0.016)	(0.015)
Other	-0.007	0.005	-0.382***	0.006	-0.131***
	(0.005)	(0.020)	(0.091)	(0.020)	(0.033)
Public body	-0.009**	-0.006	-0.232***	-0.040	-0.115***
	(0.004)	(0.019)	(0.067)	(0.033)	(0.035)
Regional agency	-0.005	0.000	-0.004	-0.067	-0.013
	(0.011)	(.)	(0.066)	(0.043)	(0.021)
Utilities	0.174***	0.083	-0.832***	-0.043	-0.239***
	(0.058)	(0.091)	(0.033)	(0.044)	(0.040)
Constant					0.420***
					(0.078)
N	150842	47775	151108	24169	151426

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

Table 24: Summary of regressions. 2-year time window. Matched data

	Non-open procedure	Short submission period	No tender call	Singel bid	CRI
Treatment (2 years)	-0.001	0.034*	-0.064**	0.006	-0.018
	(0.002)	(0.018)	(0.033)	(0.005)	(0.011)
Contract value	-0.003**	0.002	-0.001	-0.002	-0.007
	(0.002)	(0.002)	(0.017)	(0.001)	(0.007)
Domestic	0.011**	-0.011*	0.180***	0.066***	0.043**
	(0.005)	(0.006)	(0.023)	(0.008)	(0.020)
Other	-0.005	0.008	-0.400***	0.023**	-0.147***
	(0.005)	(0.008)	(0.093)	(0.009)	(0.037)
Public body	-0.007**	0.003	-0.247***	-0.003	-0.088**
	(0.004)	(0.006)	(0.069)	(0.007)	(0.034)
Regional agency	-0.005	0.000	-0.018	-0.014**	-0.019
	(0.010)	(.)	(0.070)	(0.006)	(0.027)
Utilities	0.154***	0.110	-0.868***	0.095***	-0.233***
	(0.058)	(0.116)	(0.029)	(0.036)	(0.041)
Constant					0.465***
					(0.079)
Control Variables					
Contract month	Yes	Yes	Yes	Yes	Yes
Buyer region (NUTS2)	Yes	Yes	Yes	Yes	Yes
Industry (CPV)	Yes	Yes	Yes	Yes	Yes
Buyer county (NUTS3)	Yes	Yes	Yes	Yes	Yes
N	143887	122131	143828	143866	105525

Note: Standard errors in brackets. P-value: *p<0.1; **p<0.05; ***p<0.01.
Standard errors are clustered on the municipality level.

8.3 Overview of the data filtering

Table 25: Filtering steps of the public procurement data from Romania between 2009 and 2019

	Filtering steps	Number of data points
1	Raw data	3 486 221
2	Remove missing city name	3 476 299
3	Remove missing award date	3 164 314
4	Remove contracts of a value less than 26 000 EUR (130 000 RON)	2 185 666
5	Remove contracts from national institutions	1 592 288
6	Remove contracts before 2009 and after 2019	1 203 621
7	Match with enforcement data. Remove contracts that are not related to treated cities	810 119
8	Remove contracts from Bucharest	487 871
9	Remove contracts that are more than 3 years before or after a corruption case	223 848
11)	Remove cities with less than 10 contracts	223 750

A few steps from Table 25 require some explanation. We remove contracts from national and EU institutions and Bucharest, as we only focus on municipality and regional level procurement. This is where we believe the effect of local corruption cases will materialise. As explained earlier, municipalities were chosen as the most suitable level of analysis because, given their size, the prosecution of a high-level local official on corruption charges is unlikely to go unnoticed - thereby, at least potentially, constituting a strong deterrent to future wrongdoing. We remove cases from before 2009 and after 2019 as we do not want to add noise from Covid. To isolate the effect of the corruption case in a relevant time frame, we limit the period studied to up to three years before and after the corruption case. Therefore, procurement contracts that are further away in time than $+/-$ three years from the corruption case are removed.

8.4 Overview of all municipalities with an enforced corruption case by the DNA in Romania between 2009 and 2019

Table 26: All cities with a corruption case in Romania between 2009 and 2019, with date of cases, if they are matched with procurement data, and if the city has more than 10 procurement cases after filtering on size.

	Municipality	Case 1	Case 2	Case 3	Matched	Proc<10
1	albestii de muscel	2011-07-29			Yes	No
2	alexandria	2016-07-15			Yes	Yes
3	almas	2016-06-17			No	No
4	andrieseni	2014-12-05			Yes	No
5	arad	2016-04-06			Yes	Yes
6	armenis	2013-02-09			Yes	No
7	bacau	2014-07-23			Yes	Yes
8	bahnea	2009-04-10			Yes	No
9	bals	2011-12-12			Yes	Yes
10	bechet	2015-04-27			Yes	No
11	beius	2013-08-13			Yes	No
12	berevoesti	2013-06-12			Yes	No
13	berezeni	2016-05-25			Yes	No
14	berislavesti	2012-12-14			Yes	Yes
15	biled	2010-03-09			Yes	No
16	boisoara	2011-12-04			No	No
17	borca	2015-12-21			Yes	No
18	bozovici	2016-11-21			Yes	No
19	bradu	2010-06-16			Yes	No
20	bragadiru	2013-09-27			Yes	Yes
21	brahasesti	2010-12-13			Yes	No
22	brebu	2013-02-09			Yes	No
23	bucuresti	2009-12-21	2010-06-29	2013-05-17	Yes	No
24	buzau	2013-07-11			Yes	Yes
25	calafat	2014-07-18			Yes	No
26	calarasi	2009-06-16			Yes	Yes
27	calatele	2010-01-19			Yes	Yes
28	cetateni	2015-03-25			Yes	Yes
29	cluj napoca	2011-12-22	2014-06-26	2016-12-19	Yes	Yes
30	cochirleanca	2015-06-25			Yes	No
31	codaesti	2011-03-16			Yes	No
32	constanta	2010-05-28	2013-12-16		Yes	Yes
33	copaceni	2015-11-06			Yes	No
34	corbeni	2013-05-28			Yes	No
35	corbu	2013-06-26			Yes	No
36	cornatelu	2011-06-22			Yes	No
37	covasint	2015-04-14			Yes	No
38	craiova	2010-03-17	2015-05-11		Yes	Yes
39	cristesti	2015-05-30			Yes	Yes
40	davidesti	2015-03-12			Yes	No
41	deleni	2010-06-23			Yes	Yes
42	devesel	2017-07-27			Yes	No
43	domasnea	2016-10-21			Yes	No
44	drobeta turnu severin	2014-03-27			Yes	Yes
45	farcasesti	2011-04-20			Yes	No
46	focsani	2011-02-16			Yes	Yes
47	forotic	2013-09-12			No	No
48	frasinet	2011-11-24			Yes	No
49	fruntiseni	2012-12-12			Yes	No
50	galati	2010-09-13			Yes	Yes
51	garcina	2015-10-19			Yes	No
52	ghioroc	2017-04-28			Yes	Yes
53	ghioroiu	2016-05-20			Yes	No
54	girov	2014-05-19			Yes	No
55	godeanu	2015-08-28			Yes	No
56	gorban	2012-12-12	2014-12-05		Yes	Yes
57	gradinari	2013-12-09			Yes	No

	Municipality	Case 1	Case 2	Case 3	Matched	Proc<10
58	grindu	2018-12-17			Yes	No
59	holod	2015-01-27			Yes	No
60	horia	2009-06-30			Yes	No
61	hunedoara	2011-07-27	2012-03-26	2016-10-03	Yes	Yes
62	i.c. bratianu	2014-01-27			Yes	No
63	iasi	2013-11-29	2014-10-16		Yes	Yes
64	ion neculce	2013-11-21			Yes	No
65	jilava	2016-10-28			Yes	Yes
66	leresti	2014-12-10			Yes	No
67	lipnita	2014-11-11			Yes	No
68	lopatari	2010-04-19			Yes	No
69	lunca bradului	2013-07-31			Yes	No
70	manastireni	2017-10-23			No	No
71	manesti	2011-11-15			Yes	No
72	mangalia	2014-12-02			Yes	Yes
73	maracineni	2015-03-25			Yes	Yes
74	mereni	2014-07-16			Yes	No
75	miercurea ciuc	2016-05-06			Yes	Yes
76	mihai bravu	2016-11-07			Yes	No
77	mironeasas	2014-12-12			No	No
78	moinesti	2009-07-31			No	No
79	navodari	2016-12-19			Yes	Yes
80	negresti	2010-03-01			Yes	Yes
81	nucsoara	2016-12-12			Yes	Yes
82	osesti	2014-05-05			Yes	No
83	parjol	2010-06-30			Yes	No
84	periam	2011-07-29			Yes	No
85	piatra neamt	2015-03-23	2016-12-12	2017-02-27	Yes	Yes
86	pitesti	2012-12-14	2017-02-09		Yes	Yes
87	ploiesti	2010-04-26			Yes	Yes
88	plugari	2010-07-06			No	No
89	popricani	2012-03-06			Yes	No
90	prajesti	2015-07-17			No	No
91	produlesti	2012-07-02			No	No
92	puiesti	2013-05-10			Yes	No
93	ramnicu valcea	2010-10-20	2012-10-25	2013-05-20	Yes	Yes
94	reghin	2013-12-05			Yes	Yes
95	resita	2015-12-11			Yes	Yes
96	rogova	2016-03-30			Yes	No
97	rozavlea	2010-03-04			Yes	No
98	salatrucel	2014-07-03			Yes	No
99	secaria	2013-12-04			Yes	No
100	seica mare	2009-02-05			Yes	No
101	sibiu	2014-05-20			Yes	Yes
102	sighetu marmatiei	2014-07-09			No	No
103	sipote	2012-08-06	2014-05-30		Yes	Yes
104	siretel	2011-11-07			Yes	No
105	slatina	2009-11-04			Yes	Yes
106	snagov	2012-02-13			Yes	No
107	stalpeni	2011-05-16			Yes	No
108	stoina	2015-08-05			Yes	No
109	straoane	2010-07-07			No	No
110	suici	2015-06-09			Yes	No
111	targoviste	2011-05-26	2012-10-18		Yes	Yes
112	tartasesti	2011-06-16			Yes	No
113	techirghiol	2015-11-16			Yes	No
114	timisoara	2012-09-18	2015-08-13		Yes	Yes
115	titesti	2016-06-29			Yes	No
116	tormac	2014-12-03			Yes	No
117	ucea	2011-04-22			No	No
118	vacareni	2013-01-07			No	No
119	vacaresti	2012-03-12			No	No
120	valea danului	2014-04-14	2013-10-23		Yes	No
121	varasti	2011-04-08			Yes	No
122	vaslui	2009-11-11	2011-06-24	2013-09-25	Yes	Yes
123	videle	2016-05-13			Yes	No
124	vidra	2009-07-20			Yes	Yes
125	voineasa	2011-11-11			Yes	No
126	vorniceni	2013-07-12			Yes	No
127	zarand	2013-07-19			Yes	No
128	zavoi	2010-06-22			Yes	No

9 Descriptive statistics of the dependant variables, for the matched and unmatched groups of data

Table 27: Descriptive statistics. Unmatched data.

	var	n	mean	min	q25	median	q75	max	sd
1	municipality*	223750.00	22.33	1.00	13.00	22.00	33.00	42.00	11.22
2	procedure	223750.00	0.01	0.00	0.00	0.00	0.00	1.00	0.11
3	submission	70155.00	0.04	0.00	0.00	0.00	0.00	1.00	0.20
4	tendercall	223750.00	0.68	0.00	0.00	1.00	1.00	1.00	0.47
5	singleb	33318.00	0.17	0.00	0.00	0.00	0.00	1.00	0.38
6	cri_ro	223750.00	0.34	0.00	0.17	0.40	0.50	1.00	0.19
7	log_price	223750.00	13.85	10.17	12.54	13.86	15.09	21.41	1.71
8	domestic*	223750.00	1.52	1.00	1.00	2.00	2.00	2.00	0.50

Table 28: Descriptive statistics. Matched data.

	var	n	mean	min	q25	median	q75	max	sd
1	municipality*	12283.00	12.69	1.00	12.00	12.00	18.00	25.00	5.62
2	procedure	12283.00	0.01	0.00	0.00	0.00	0.00	1.00	0.08
3	submission	12283.00	0.01	0.00	0.00	0.00	0.00	1.00	0.12
4	tendercall	12283.00	0.02	0.00	0.00	0.00	0.00	1.00	0.13
5	singleb	12283.00	0.12	0.00	0.00	0.00	0.00	1.00	0.32
6	cri_ro	12283.00	0.12	0.00	0.07	0.09	0.15	0.70	0.08
7	log_price	12283.00	14.04	10.19	12.98	13.93	15.18	18.77	1.44
8	domestic*	12283.00	1.99	1.00	2.00	2.00	2.00	2.00	0.12

9.1 The complete list of data extracted from the DNA press releases

- Nr. of penal decision
- Date of indictment
- Date of definitive sentencing
- Surname and given name
- Sex (M/F)
- Person rehabilitated (yes/no)
- County where the crime was committed
- Court that gave final sentencing
- Types of crime
- European Funds (yes/no)
- Public Acquisitions (yes/no)
- Territorial centre that investigated

- Fine is shared (yes/no/does not apply)
- Sum to recover/payments to public entities (RON)
- Sum to recover/payments to public entities (EUR)
- Sum to recover/payments to public entities (USD)
- Seizure (yes/no/in kind)
- Seized sum in RON
- Seized sum in EUR
- Seized sum in USD
- Sentence in Years and Months
- Suspended sentence (yes/no)
- Important function (yes/no)
- Public Sector (yes/no)
- Actor's title/function
- Institution of involved actor
- Municipality of Institution
- Surname and given name
- Name of commercial firm
- Political Party Link