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Energy, Transport & Environment

Center for Economic Studies
Discussions Paper Series (DPS) 11.29
http://www.econ.kuleuven.be/ces/discussionpapers/default.htm

November 2011

DISCUSSION PAPER

Judicial Policy Lines in the Criminal Sanctioning of Environmental Offenses: An Empirical Study[†]

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[†] We would like to thank the Strategic Basic Research program of the Institute of Science and Technology for the financial support provided during the research project 060034 (www.environmental-lawforce.be).

Abstract

We analyze judicial policy lines concerning criminal environmental sanctioning using a unique European dataset of individual criminal cases, including case-specific information on offenses and offenders. We investigate policy choices made by criminal judges in lower courts as well as the relevant court of appeal. The sanctioning policy of judges proofs to be varied as well as consistent. Judges decide to postpone convictions for cases they deem less important. They carefully balance effective and suspended sanctions, in general using them as substitutes, but in specific cases opting to use them cumulatively. Overall, judges in lower courts balance environmental and classic criminal law and aim at protecting individuals and their possessions as well as the environment.

Keywords: Judicial policy; Environmental crime; Criminal sanctions

I. Introduction

In a world where firms and individuals do not automatically comply with legislation, monitoring and enforcement strategies are necessary elements of an effective and well-designed environmental policy. One of the less documented phases of the environmental monitoring and enforcement process is the sanctioning policy applied by criminal judges. In this contribution, we therefore construct a comprehensive picture of judicial lines of policy in the criminal sanctioning of environmental crime in the Flemish Region in Belgium. Our dataset, a collection of individual criminal cases that is unique in Europe, includes case-specific information on offenses, offenders and imposed sanctions. To start, we investigate three policy choices made by criminal judges in courts of first instance: whether the conviction in the case should be postponed or not; whether the offense should be punished with an effective sanction, a suspended sanction or a combination of both; and what the level of the effective and/or suspended sanction should be. In a next step, we analyze whether appeal judges confirm or adapt the initial verdicts and if verdicts are adapted in the appeal stage, we examine the size and direction of these changes. These analyses provide interesting and detailed insights into the available judicial policy options as well as the specific policy lines observed in practice.

Judicial behavior has been extensively studied from a behavioral law and economics viewpoint (see, for instance, Guthrie et al. 2001). Prior to the emergence of this interesting strand of literature, Marks (1988) was one of the first to state that behavior of judges can be examined in a rationality-based framework. Since the 1980s, a significant body of theoretical research has been developed to understand judicial behavior (see Spiller and Gely (2007) for a US based overview). However, most studies are framed within a common law context. Thus not all results, for instance concerning the importance of judicial precedence (see Rasmusen 1994 and Levy 2003), carry over to a civil law context. Fon and Parisi (2006)

state, for example, that judicial precedent can be an important component of judicial decision making in civil law countries, but that its influence depends on the requirement for consistency with previous case law. Nonetheless, when the law gives the judges broad discretionary freedom, the rule of precedence can become virtually unimportant. This is generally speaking the case for the determination of sanctions within the criminal law system of civil law countries: judges have extensive discretionary freedom when deciding on the type and level of sanctions in criminal cases, and thus the rule of precedence fades away in this subject area. With regard to Belgium, this analysis is corroborated by a recent study by Monsieurs et al. (2009) who surveyed Belgian judges with criminal case loads and found that the influence of judicial precedent is indeed very limited in the sanctioning decision process. Judges state that they sometimes (54%) or rarely (24%) take decisions by fellow judges into account when making sanctioning decisions.

A recent overview of the determinants of the monetary penalties imposed in practice for violations of environmental pollution legislation is provided by Rousseau (2009). She discusses the determinants and levels of monetary penalties for environmental offenses found in practice including administrative, civil as well as judicial sanctions. Three major categories of variables are distinguished: the circumstances of the offense, the characteristics of the offenders, and the indirect political and institutional effects. Some general trends emerge: fines increase with the harm caused by the offense, and fines are higher for repeat offenders as well as for intentional offenses. Also, the studies discussed indicate that political and institutional factors matter. According to this literature overview, only a couple of empirical studies deal with the level of criminal monetary sanctions for environmental offenses.

In one of the first empirical studies, Cohen (1992) analyzes the monetary fines imposed by federal criminal courts on firms sentenced between 1984 and 1990 in the US. The author found that the particular type of violated legislation clearly had a considerable impact on the

size of the fine imposed on convicted firms or on individuals convicted as co-defendants. Moreover, offenses resulting in large clean-up costs led to significantly higher fines and large firms received higher fines than small firms. Slightly surprising, firms found guilty after trial did not receive higher sanctions than those that pled guilty. Also, Billiet and Rousseau (2003) and Rousseau and Billiet (2005) performed an analysis of the jurisprudence of the Court of Appeal of Gent (Belgium) for the period 1990-2000 concerning discharge permits and environmental permits. The authors examine the fines pronounced by the Court of Appeal as well as the fines that were initially imposed by the courts of first instance for these cases. Fines imposed by the courts of first instance are significantly higher when the defendant had a criminal record, and for infractions on the Flemish Environmental Permitting Act 1985 or its predecessor, the Labor Safety Decree 1946, compared to other legislation. As in the rest of the European Union, environmental permitting legislation is a centerpiece of environmental regulation in Flanders since decades. Recently its crucial importance was again confirmed by the European Directive 2010/75/EU on industrial emissions. Billiet and Rousseau (2003) further found that, contrary to the rulings in first instance, the appeal judges explicitly take the intentions of the violator as well as the harm caused to third parties into account. Finally, Blondiau and Rousseau (2010) study the influence of a judge's objective function on the type of sanctions – fine and firm closure – used for enforcing environmental standards. Using a subset of the dataset used in this paper, they examine to which extent judges in Flanders take social costs of sanctions, which are obviously much higher for firm closures than for the imposition of fines, into account when judging environmental violations. The authors find that besides minimizing environmental damages judges also explicitly take social sanctioning costs into account.

While the limited number of previously executed studies yields interesting insights into judicial sanctioning decisions for environmental offenses, none of them provides a picture of

judicial lines of policy in determining criminal sanctions given the variety of different judicial policy options available. Thus we explicitly analyze the judicial sanctioning decisions in a more general framework taking the different sanctioning possibilities such as the option to postpone a conviction or the use of both suspended and effective sanctions into account. The analysis allows us not only to identify broad, general trends in criminal judicial decisions making such as leniency towards offenders that took positive actions to limit damages, but also to investigate the specific factors determining sanctioning decisions for particular offenses such as violations of environmental permitting requirements.

In section 2 we describe the legal background to environmental enforcement practices in Flanders. In section 3 we formulate five hypotheses that will be empirically tested. The data used in the analysis are summarized in section 4, while the results are presented in section 5 and discussed in section 6. Section 7 concludes.

II. Background to environmental enforcement in Flanders

The empirical evidence presented in this contribution deals with the criminal enforcement of environmental legislation in Flanders, Belgium. Therefore, we provide a short overview of the most relevant characteristics of the Belgian and Flemish legal system.

Belgium is a federal state that was created through a series of state reforms starting in 1970 from an initially unitary form of government. Most environmental competences are delegated to the regional legislators of the Flemish Region, the Walloon Region and Brussels Capital Region, except for the important competences relating to product standards, protection against ionizing radiation and the marine environment. The judicial organization, Criminal Procedure law and Criminal law, on the other hand, constitute a nearly exclusively federal matter. However, the federated entities, namely the Regions, have the competences to criminalize breaches of the legislation belonging to their subject areas of competence and to

determine which of the sanctions included in the federal Criminal Code are applicable to these offenses.

Public law enforcement is the dominant enforcement method for environmental crime; civil law enforcement plays only a modest part. Within the public law enforcement, the enforcement by means of criminal law is important: environmental crime reaches the criminal courts (Van den Berghe 1992, Van den Berghe 2002). Administrative law enforcement chiefly uses remedial sanctioning instruments, within a context that nicely illustrates the concept of the enforcement pyramid developed by Ayres and Braithwaite (1995), working extensively with notices of violations and applying remedial sanctions to a rather limited, but growing, extent. Administrative fines exist since a long time but only recently did the regional and federal legislators, each within their own subject areas of competence, introduce the possibility to inflict them for environmental crime at large (see, among others, Billiet 2008). In the Flemish Region this evolution was implemented by use of the Flemish Environmental Enforcement Act 2007 (entry into force May 1st, 2009), an act that strengthened both the criminal and the administrative sanctioning possibilities for environmental offenses.

Each initial notice of violation[1] is send to the public prosecutor's office and a case is officially recorded. In this pre-court stage, more than 95% of the environmental offenses (see Vander Beken and Balcaen, 2007) follow a similar trajectory and are handled by only one decision maker, namely the public prosecutor. The public prosecutor can choose between dismissal, settlement or criminal prosecution of each case. Based on summary statistics, approximately 60% of the environmental cases in Flemish judicial districts end with a dismissal, 14% with a settlement, 8% end before a criminal court, and the remainder is

[1] In principle, each environmental offense detected by an environmental inspector or a police officer should result in a notice of violation (art. 29 Criminal Procedure Code). In practice, many – though not all – detected offenses lead to a notice of violation.

merged with previously existing dossiers or referred to other courts[2]. About half of the dismissals have a technical motivation such as lack of evidence or the impossibility to positively identify the offender, while the other dismissals are based on policy reasons, typically the motivation that the committed offense has no priority or that the situation has been regularized[3]. Belgian Criminal Procedure Law does not involve prosecution guidelines, nor with regard to the decision to prosecute, nor with regard to the type or level of sanctions to request from the judge. Consequently, the discretion of the public prosecutor with respect to the decision to prosecute or not and the selection of requested sanctions is very broad. While the Council of Procurators-General approved a memorandum describing the priorities[4] concerning criminal environmental prosecution policy in May 2000, this memorandum does not bind the public prosecutors in any way.

Cases where the public prosecutor opted for a prosecution reach the courts. In general, Belgian criminal law is based on the concept of guilt. To qualify as a crime, a mere infringement of the law does not suffice. Besides this element, namely the material part of the crime, to a lower or higher extent some level of guilt, namely the moral part of the crime, is required. Due to this strong focus on guilt, legal persons were made criminally liable since 1999 only after lengthy discussions.

[2] For the time span from January 1st 1993 to December 31 2002: *Parliamentary Questions, Senate*, 2003-2004, December 2 2003, 328 (Question nr. 3-243 H. Vandenberghe). The number of settlements used to be in those years around 10%, the number of prosecution decisions some 5%. Those numbers increased slightly throughout the first decade of this century. See also the Flemish Environmental Enforcement Report (Milieuhandhavingsrapport 2009, 120).

[3] Initial descriptive data following the coming into force of the Flemish Environmental Enforcement Act 2007 indicates that the prosecutors in the Flemish Region currently refer some 10% of cases previously ending with a discretionary dismissal to the administration with sanctioning competences.

[4] Prioritized offenses are essentially those that have or might have serious consequences for public health and the environment, have an organized character, are committed in a professional context or concern the exploitation of a plant or activity without the required authorization.

The sanctioning policy of the criminal judge evolves from the moment that proof of the facts and proof of their imputation to an identified perpetrator are established. The sanctioning decision specifically involves three basic options that allow criminal judges a substantial discretionary freedom. The first option is the choice not to punish: within the scope of legislative conditions, which exclude the most serious cases, the criminal judge can opt for the postponement of the verdict of conviction. Postponement is always associated with a probationary period of at least one and at most five years. When the criminal judge does not opt for postponement and thus opts for penalization, he should impose at least one main sanction. Belgian criminal law knows three main sanctions: imprisonment, fines and community service. Choosing more than one of these sanctions is perfectly possible, for instance combining a fine with a prison sentence (see Billiet and Rousseau *forthcoming*). For each main sanction he chooses to impose, the judge also needs to determine the stringency of the penalty within the lower and upper bounds determined by the legislator. The margin between those lower and upper bounds is typically very large. For instance, the new Flemish Environmental Enforcement Act includes margins with a minimum of 100 euro and maxima between 100,000 and 500,000 euro with respect to criminal fine levels[5]. Concerning imprisonment, the minimum it provides for is always one month and the maxima amount from one to five years. Also, the Criminal Code includes a conversion mechanism of prison sentences, when the offender is a legal entity. The third and final policy element entails the possibility to partially or completely suspend the execution of the penalty. Comparable to postponement, suspension of execution is always linked with a probationary period of at least one and at most three to five years. Criminal legal doctrine classifies both postponement and suspension as favors, namely expressions of leniency. Both options put a clear emphasis on

[5] In Belgium, the fine amounts mentioned in legislation are multiplied by a legal correction factor (‘opdeciemen’) to counter the effects of monetary depreciation. This correction factor is currently 5.5, but can vary in time. The margins mentioned in the text do not take this correction factor into account.

individual deterrence. The convicted offender who does not relapse during the probationary period will not be convicted (postponement) for the facts under consideration resp. does not have to submit to the imposed sanction (suspension); however, if he or she does relapse, the offender will be convicted resp. has to submit to the sanction. Once the criminal judge has imposed at least one main sanction, suspended or not, he or she can also impose one or more additional sanctions such as a remediation order or the forfeiture of illegally acquired benefits.

The policy that criminal judges develop within these extremely broad policy margins is not guided by sentencing guidelines. Such guidelines do not exist within Belgian criminal law. Moreover, criminal judges are not bound by the particular sanctioning request made by the public prosecutor or, as mentioned earlier, by the penalty determined in previous similar cases. The only decisive factor in the determination of the sanction is the criterion of 'the seriousness of the offense': the criminal judge has to punish 'in proportion to the seriousness of the offense'[6]. This criterion, which the Belgian Supreme Court keeps stressing, includes two subcriteria: the objective gravity of facts *as such* and the culpability of the defendant.

[6] With this basic criterion the case law of the Belgian Supreme Court of course corresponds with a general principle of criminal law that is applied worldwide. Looking at the European Union, the proportionality principle for the sanctioning decision and the determination of sanctions is quite specifically fixed in the framework of the Council of Europe, more specifically Recommendation No. R (92) 17, adopted by the Committee of Ministers on 19 October 1992, concerning consistency in sentencing: "*Whatever rationales for sentencing are declared, disproportionality between the seriousness of the offence and the sentence should be avoided.*" (par. A.4); "*Maximum penalties for offences and, where applicable, minimum penalties should be reviewed so that they form a coherent structure which reflects the relative seriousness of different types of offence.*" (par. B.1); "*Although it may be justifiable to take account of the offender's previous criminal record within the declared rationales for sentencing, the sentence should be kept in proportion to the seriousness of the current offence(s).*" (par. D.2); "*Where an offender is sentenced on one occasion for several offences, the decision on the severity of the sentence or combination of sentences should take some account of the plurality of offences but should also remain in proportion to the seriousness of the total criminality under consideration*." (par. D.5). More recently, the principle of proportionality between criminal offenses and the severity of penalties has been enshrined in the Charter of Fundamental Rights of the European Union – art. 49 Charter (*Pb*. 2007, C 303) which is a binding text since the entry into force of the Treaty of Lisbon on 13 December 2007.

The gravity of the facts is rated by the extent to which the unlawful activities harmed, or might have harmed, the public interest protected by the violated legislation. In Belgian environmental legislation the protected public interest always consists of (one aspect of) the environment, that is protected for the sake of the individual (with a strong focus on health issues), the environment as such, or both. The assessment of and the importance attached to harm by the Supreme Court are therefore in line with the attention to harm that can be found in the existing law and economics literature on optimal penalties; see, for instance, Polinsky and Shavell (1979; 1992; 1994; 2007), Cohen (2002), Garoupa (2001), and Rousseau and Telle (2010). Moreover, according to the theory of marginal deterrence developed formally by Shavell (1991, 1992) and Mookherjee and Png (1994), optimal sanctions should rise with the harmfulness of acts and reach the extreme only for the most harmful acts. To conclude, besides the culpability of the offender, both harm and potential harm associated with the prosecuted offense are important factors in determining the applicable sanction.

In the lower courts of first instance criminal judges usually sit in chambers consisting of three judges and only occasionally alone. Judgments pronounced by the court of first instance can be appealed by each of the concerned parties with the competent court of appeal that generally sits in a chamber of three. If the prosecutor appeals, which he systematically does when a defendant appeals, the appeal judge is completely free in determining the penalty: he can reduce, confirm or increase the verdict pronounced by the judge of first instance.

Persons, individuals as well as legal persons, who consider themselves harmed by the offense under consideration, can become a civil party in the criminal case. If the defendant is convicted, the judge will simultaneously rule on civil claims and, if necessary, award damages.

Contrary to some other countries, the Belgian legal system does not have specialized environmental prosecutors nor specialized environmental courts[7]. Analogously to the rest of Europe and the world (Pring and Pring 2009), there is however an increasing demand for such specialization due to the complexity of environmental matters.

III. **Hypotheses**

Since the basic sanctioning criterion of the seriousness of the offense requests the criminal judge to punish in proportion to the gravity of the facts, including the harm caused, and since the protection of the environment for the sake of public health and the environment as such lie at the core of the studied environmental legislation, we expect offenders who actually caused pollution and nuisance, such as excessive noise levels leading to health problems in third parties or effluent discharges leading to irrevocable environmental damage to ecosystems, to be sanctioned more stringently. In practice, the gravity of the facts, namely the estimated harm, is thought to increase when a) the pollutant was noxious, widespread or pervasive, or liable to spread widely or have long-lasting effects; b) extensive clean-up, site restoration or animal rehabilitation operations were required; or c) other lawful activities[8] were prevented or significantly interfered with (see, for instance, the US Sentencing Commission 1993, 2008, and the UK Sentencing Advisory Panel, 2000). Since environmental damage depends on the particular geographical and temporal context of the violation, the characteristics of the physical environment such as surface water quality or air quality also matter. The gravity of the facts is likely to increase if human health, animal health, or flora were adversely affected. Also, the presence of civil parties might imply that

[7] There exists, however, one exception: the Flemish Environmental Enforcement Act 2007 created the Environmental Enforcement Court of the Flemish Region, an administrative court that controls the legality of administrative decisions imposing monetary sanctions (fines and forfeiture of illegally acquired benefits) for environmental offenses.

[8] For instance, noise levels produced by the offender put off customers of a neighboring restaurant.

the violation was potentially more damaging to other persons and thus the sanction might be higher. Further, the court can take account of mitigating factors that reduce the gravity of the facts. Such mitigating factors include, among other things, the defendant's prompt reporting of the offense and ready co-operation with the enforcement authorities and the fact that the defendant took steps to remedy the problem as soon as possible. Moreover, the way the violation is discovered matters: voluntary reports can be expected to result in lower penalties since the actions to avoid additional harm could start sooner than in situations where the inspection agency discovers the violations on its own or receives complaints from concerned individuals. Thus, we can formulate a first hypothesis:

Hypothesis 1: Sanctions imposed as a result of more, or potentially more, harmful offenses are expected to be higher than sanctions for less, or potentially less, harmful offenses.

Since Belgian criminal law is a based on the concept of material as well as moral culpability, the culpability of the offender is an important determinant of the appropriate sanction besides environmental harm or environmental risk. The offender's degree of culpability, or guilt, can be measured in several ways: a) the offense is shown to have been a deliberate or reckless breach of the law, rather than the result of carelessness; b) the defendant has acted from a financial motive, whether for profit or cost saving (gain); c) the defendant has failed to respond to cautions from the relevant regulatory authority; d) the defendant has ignored relevant concerns voiced by employees or others; e) the defendant is shown to have had knowledge of the specific risks involved; and f) the defendant's attitude towards the environment authorities was dismissive or obstructive (see UK Sentencing Advisory Panel, 2000). The aforementioned memorandum of the Council of Prosecutors-General pays special attention to one of these: the acting from a financial motive. Furthermore, judges can pursue different objectives such as social welfare maximization,

deterrence maximization or the provision of justice (including the notion that crime should not pay). Blondiau and Rousseau (2010) provide empirical evidence that in Flanders judges pursue a mix of these objective functions when sanctioning environmental crime. The combined objective functions imply that – at least to some extent – sanctions should try to take away the gain obtained from the offense, which is also a measure of guilt, as well as try to internalize the harm caused by the offense.

This allows us to formulate our second hypothesis:

Hypothesis 2: The stringency of sanctioning decisions is expected to depend positively on the profitability of the offense as well as the seriousness of the harm caused.

Looking at the different measures for harm and guilt mentioned above, we see that not all measures are equally objective. Some measures are unambiguous such as the presence of a criminal record or the presence of civil parties, while others require a more subjective interpretation such as whether the offender willingly and knowingly violated the legal rule. Also tangible, measurable harm such as waste is more readily to assess than some other more hidden types of harm such as soil contamination. For a limited dataset in Flanders, Rousseau and Billiet (2005) found that judges seem to attach more weight to objective case characteristics than to subjective ones. Also, given that Belgian courts deal with a variety of cases and are not particularly specialized in environmental crime, this might lead the judges to rely more heavily on objective case characteristics that require little specialized knowledge. Hence, our third hypothesis states:

Hypothesis 3: The effect of objectively verifiable characteristics related to the seriousness of the offense and/or the level of guilt on the level of the imposed sanction is expected to dominate more subjective or less tangible case characteristics.

Besides the level of the sanction, judges can also choose between effective and suspended sanctions. The use of suspended sanctions was introduced in Belgium in order to solve the problem of short prison sentences (Van den Wyngaert 2009). The practical problems related with insufficient room in prisons and the difficulty of integrating ex-convicts in society, especially in the labor market, could be mitigated by the introduction of suspended sentences without completely compromising the deterrence effect of the sanction. The use of suspended sanctions, considered to be a choice expressing leniency, soon spread from prison sentences to criminal fines. The general idea, advocated by the high courts of the country, including the Constitutional Court, and literature, was that judges would substitute effective sanctions by suspended sanctions, leading to a negative relationship between the level of the effective sanction and that of the suspended sanction. However, as a logical alternative possibility, judges might use effective and suspended sanctions cumulatively as two specific parts of an imposed sanction. This leads to a fourth hypothesis:

Hypothesis 4: If suspended sanctions are used as a less stringent substitute for effective sanctions, the stringency of effective and suspended sanctions are expected to be negatively correlated.

Even though in principle institutional factors should not matter, the analysis of Rousseau and Billiet (2005) showed that the judging decisions in the Court of Appeal of Gent are based on different characteristics than the judging behavior in the courts of first instance. More than the lower courts, the higher courts tend to preserve the core principles and values of the law submitted to them. The ground layer of the judicial work of criminal courts, throughout all fields of crime, is common criminal law. The backbone of common criminal law in Belgium is a criminal code from 1867, centered on 19th century ideas of personal guilt as the reason for punishment and of the necessity to limit the ius puniendi to essentials, mainly the

protection of the individual's life and physical integrity and the protection of individual property. It is very interesting to note that this rationale, a typical criminal law rationale, surfaces in the results of Rousseau and Billiet (2005). As already mentioned, Belgian Environmental law typically aims at protecting the environment for the sake of the individual (public health) and/or the environment as such. Hence, the core values of criminal law and environmental law are not the same, even if the protection of the individual's physical integrity offers an area of overlap. In the findings of Rousseau and Billiet (2005), the Court of Appeal of Gent rather seems to be a house of criminal law than of environmental law. Thus, our fifth hypothesis is:

Hypothesis 5: Judgments from the courts of first instance are more likely to reflect the core values of environmental law rather than those of criminal law, while judgments from the court of appeal are more likely to reflect the core values of criminal law rather than those of environmental law.

These hypotheses can be tested through the influence of variables relating to the gravity of the facts, the physical integrity of individuals, the protection of property and guilt on the type and level of criminal sanctions imposed by the judges.

IV. **Data**

In this section we first describe the dataset (4.1), next we define the dependent variables (4.2) and finally we provide definitions for the explanatory variables (4.3).

A. Description of the dataset

In order to document the criminal decision process in Flanders, we investigated judgments at seven courts of first instance and at the Court of Appeal of Gent concerning the complete

environmental case law from 2003 to 2007 (see Billiet et al. 2009) [9]. The different legislative texts included in the dataset are listed in Appendix A. Thus, we collected 1034 sentences of courts of first instance and 122 appeal sentences. In total, 1882 defendants are tried in these 1156 criminal prosecutions: 1617 in first instance and 265 in appeal. Some 80 percent of the defendants are individuals, while only 20 percent are legal entities. Since each defendant can face several accusations, the criminal cases include 3561 separate accusations, of which 3004 were dealt with in first instance and 557 in appeal.

A limited number of legislative texts dominate the case law: over two in three accusations involve violations of the Flemish Environmental Permitting Act 1985 and the Flemish Waste Act 1981[10]. The other charges mainly concern violations of manure and noise legislation. Moreover, the judgments usually contain information on the type of pollution or nuisance that took place. Waste problems (34%) and noise nuisance (14%) are most frequently mentioned, followed by water pollution (9%) and soil contamination (7%). Descriptions of the harm that was caused are rather scarce. When harm is explicitly mentioned, the judicial decisions refer in general to damage done to public health or the health of third parties (8% combined). Damage to the environment, more specifically to fauna, flora and vulnerable areas, is stated less frequently (5% combined). Further, it is noteworthy that damage to the property of third parties is hardly mentioned at all (less than 1%).

[9] The data are collected within the SBO-project *"Environmental law enforcement: A comparison of practice in the criminal and administrative tracks"* (2007-2011). More information can be found on the website www.environmental-lawforce.be.The dataset was gathered in Brugge, Dendermonde, Gent, Ieper, Kortrijk, Oudenaarde and Veurne. Thus we collected data for 7 out of the 13 judicial districts in Flanders. All appeals at these seven courts are dealt with by the Court of Appeal of Gent, one of the five Belgian courts of appeal.

[10] In even more detail, over half of the accusations deal with three distinct articles of law: the prohibition to discard waste, the environmental permit obligation and the obligation to comply with the exploitation conditions specified in environmental permits (resp. art. 12 Flemish Waste Act 1981, art. 4 §1 Flemish Environmental Permitting Act 1985 and art. 22 par. 1 ibid.).

In first instance, judges convict three in four defendants. Moreover, one in eight defendants is acquitted, while for the remaining defendants the conviction is postponed. The judges in appeal convict a similar fraction of the defendants (three in four), but appear to acquit more defendants (one in six). Looking at the type of sanctions, we find that the monetary fine is by far the most used criminal sanctioning instrument since it is imposed in over 95 percent of the convictions. For legal entities, the average fines – including the legal correction factor ('opdeciemen') – amount to 14569 euro in first instance and 10733 euro in appeal. For individuals, the average fines are significantly lower: 3787 euro in first instance and 8061 euro in appeal. Moreover, for individuals, it is especially noteworthy that in 10 to 15 percent of the convictions a prison sentence (combined with a fine) is imposed (see table 1). The average duration of a prison sentence is 4.4 months in first instance and 6.2 months in appeal.

INSERT TABLE 1 ABOUT HERE

B. Definition of the dependent variables

We investigate the basic policy choices made by judges once the facts are established and the imputation issue is solved. We do not include acquittals in our empirical analysis since under Belgian criminal law the decision to acquit is a technical, and not a policy, matter. In first instance, the choices we study are: 1) the choice to pronounce or to postpone a conviction, 2) the choice of the level of sanction included in a verdict, and 3) the choice of suspending (part of) the sanction. Thus, the dependent variables for the analysis of the judgments in first instance are:

- the dummy variable POST which represents whether a judge awards the favor of postponement of the conviction (POST=1) or not,
- the continuous variable EFFSAN which represents the level of the effective sanction in euro;

- the dummy variable PROBSUS which represents whether a judge decides to impose a suspended sanction (PROBSUS=1) or not; and
- the continuous variable SUSSAN which represents the level of the suspended sanction in euro.

In order to calculate the level of the sanctions imposed by the criminal court, we look at the sum that the offender actually needs to pay, including the legal correction factor ('opdeciemen'). Moreover, we need to aggregate fines and prison sentences. Thus we need to calculate an equivalent monetary value for prison sentences. For a set of environmental regulations, we compare the legal maximum of the fines and prison sentences that can be imposed on individuals with the maximum fines for legal bodies. Firms can obviously not be imprisoned, so it is clear that there will be a difference in the legal maxima for the fines that can be imposed on both groups in order to secure an equal and non-discriminatory treatment. Taking advantage of these differences, we derive an (approximate) equivalent monetary value for a prison sentence (for more details, see appendix B).

After the analysis of the sentences formulated by courts of first instance, we estimate the probability that an appeal is initiated, either by one or more of the defendants, by civil parties or by the public prosecutor. In a next step, we study how the appeal judges modify the verdicts imposed by courts of first instance. Here, we again make the explicit distinction between the changes in effective sanctions and the changes in suspended sanctions. Thus, the dependent variables for these analyses are:

- the dummy variable APPEAL which indicates whether at least one of the parties appealed the initial verdict (APPEAL=1) or not;
- the continuous variable DIF-EFFSAN which represents the difference (in euro) between the effective sanction imposed in appeal and the effective sanction initially imposed in first instance; and

- the continuous variable DIF-SUSSAN which represents the difference (in euro) between the suspended sanction imposed in appeal and the suspended sanction initially imposed in first instance.

The estimation of the probability that a verdict was appealed is necessary to correct for a possible sample selection bias, even though this decision is not part of the judicial policy. The public prosecutor appealed against the first instance judgment in all our appeal cases, either as primary or secondary party. Because of this, the appeal judges faced no additional constraints in modifying the initial verdict: they were free to reduce, confirm or increase the sanction imposed by the lower courts.

Definition of the explanatory variables

In order to investigate the judicial sanctioning policy in more detail, we analyze the impact of several explanatory variables on the decision processes. To a large extent, these explanatory variables aim at measuring the impact of the seriousness of the offense on the sanctioning policy, including the objective gravity of the facts as well as the subjective culpability of the offender. Further, we also include some variables to control for differences between courts and for possible time trends.

First we take the *type of offender* into account. The offender is either a legal person (FIRM=1), an individual offending during his/her professional activities (PROF=1), or an individual offending during his/her private activities (namely reference category). Our dataset includes 17% legal entities, 35% 'professional' offenders and 48% 'private' offenders. Almost half of the 'professional' offenders were prosecuted jointly with a legal entity, while this is only true for 13% of the 'private' offenders.

Next, we look at proxies for the *seriousness of the offense* and distinguish three different categories: a) variables mainly concerning the gravity of the facts, b) variables that concern

both the gravity of the facts and the culpability of the offender, and c) variables mainly concerning the culpability of the offender.

Variables concerning the gravity of the facts

The count variable PROVEN ACC represents the total number of proven accusations incorporated in the verdict. Only information dealing with these proven offenses is included in our analysis. In first instance (appeal), each offender faced on average 2.1 (2.7) proven accusations. The continuous variable DURATION expresses the length of the longest-lasting offense in days. The average duration of the longest-lasting offense was 505 days in first instance. When the judgment revealed that one or more offenses committed by the offender was uncovered during an inspection of the Flemish Environmental Inspection Agency, the dummy variable EPA equals one. This was true for 12% of the offenders in first instance. Note that the Agency typically focuses its monitoring activities on firms that are relatively more damaging to public health and the environment.

Further, we also know whether one or more of the offenses committed by the offender classifies as a prioritized offense (dummy variable PRIORITY=1) according to the aforementioned memorandum of the Council of Prosecutors-General. Some 23% of the offenders committed at least one prioritized offense according to the verdicts in first instance. The judgments can also explicitly describe the damage caused by the offenses. Specifically we distinguish offenses damaging vulnerable ecosystems, fauna or flora (dummy variable NATURE=1), and offenses damaging public and/or private health (dummy variable HEALTH=1). In first instance, 3.6% of the offenses were harmful to nature and 8% were harmful to health. In appeal, these percentages are raised to 4.6% and 27%, respectively.

The dummy variable CIVIL PARTY represents whether one or more civil parties, seeking compensation for damage caused to themselves or their property, were involved in the case or

not. In first instance, one or more civil parties were involved in the case of approximately 15% of the offenders, in appeal the percentage was some 26%.

Also, we know whether the offense involves a breach of the obligation to have a valid environmental permit (dummy variable PERMIT=1) or of conditions stated in the environmental permit (dummy variable PERMIT-COND=1). As mentioned before, environmental permitting is a centerpiece of environmental legislation in Flanders and, generally speaking, the European Union. Further, we also look at the type of pollution associated with the offense. More specifically, we distinguish six different types by defining the appropriate dummy variables: offenses related to illegal waste treatment or disposal (WASTE), soil or groundwater contamination (SOIL-GROUND), noise pollution (NOISE), odor hindrance (ODOR), air pollution (mostly relating to dust and dust particles) (AIR) or surface water contamination (WATER).

Variables concerning the gravity of the facts and the culpability of the offender

The dummy variable POSITIVE reflects whether the judgment mentioned if the offender took measures to remediate, clean up or solve the damages caused by the offenses. In first instance, some form of positive action was acknowledged for 23% of the offenders.

Variables concerning the culpability of the offender

The judgment can mention whether the offender was previously convicted (dummy variable RECORD=1) or not for environmental or non-environmental offenses. In first instance some 13% of offenders had a criminal record. To measure the attitude of the offender in the case under consideration, we use the dummy variable INTENT. The variable equals one if one or more of the following terms is used in the judgment: ‘knowingly and willingly’, ‘purposefully’, ‘purpose’, ‘determined’ or ‘unwillingness’. In first instance, 11% of offenders scored positive on this variable. The judgment often explicitly mentioned if an offender acted in pursuit of gain and received economic benefits from the offense. The dummy variable

GAIN-SEEK equals one if one or more of the following terms is used in the written motivation of the verdict: 'pursuit of gain', 'pursuit of profit', 'economic gain', 'economic benefit', 'financial gain', 'financial benefit' or 'profitable'. In first instance, 17% of offenders scored positive on this variable.

Finally, we also include a number of *control variables* to investigate the presence of systematic differences in judicial policies in different courts and in different years. The dummy variables BRUGGE, GENT, KORTRIJK, OUDENAARDE and WESTHOEK respectively reflect whether the verdict was pronounced by the court of first instance in Brugge, Gent, Kortrijk, Oudenaarde or in Ieper or Veurne (namely the 'Westhoek'). The reference category is the court of first instance in Dendermonde. Also, the dummy variables YEAR04, YEAR05 and YEAR06 represent whether a verdict was pronounced in respectively 2004, 2005 or 2006. The year 2003 is used as reference category.

V. **Results**

We now turn to the results of the estimation and investigate the determinants of judicial decisions in Flanders. First we analyze judgments made by the courts of first instance and then we check if and how these judgments are subsequently changed by the appeal court.

A. Courts of first instance

In order to capture several dimensions of criminal enforcement, we investigate when offenders are more likely to have their conviction postponed and, if no postponement is granted, we estimated the level of the effective sanction, the probability of incurring a suspended sanction and the level of such a suspended sanction.

1. Probability of postponement

The probability of postponement of the conviction depends on several factors related to the offenders, the characteristics of the offense and some control variables (see table 2). Looking

at the offenders' characteristics, we find that individuals who offended in the course of their professional activities have a higher probability of postponement.

When we consider the variables that relate to the gravity of the facts, we find both expected and unexpected results. Surprisingly, offenders who caused harm to vulnerable habitats, fauna or flora seem to have a higher probability of having their conviction postponed. The same holds for offenses involving a breach of the conditions stated in the environmental permit. As expected, the probability of postponement is significantly lower for prioritized offenses, offenses relating to waste management, noise pollution or odor. Furthermore, we find that offenders who took positive actions to clean up or mitigate damages have a higher probability of postponement.

Looking at the variables that reflect the culpability of offenders, we see that offender with previous convictions have a significantly lower probability of having the current conviction postponed. Also, convictions of offenders motivated by profit seeking are significantly less likely to be postponed.

Finally, we note that offenders tried in Brugge or in the Westhoek as well as offenders tried in 2004 or 2006 have a significantly higher probability of postponement.

INSERT TABLE 2 ABOUT HERE

2. Effective sanction

Now we focus on the offenders that were convicted and investigate the level of the effective sanction, namely the sum of the effective monetary fine and the monetary equivalent of the effective prison sentence, imposed by the court (see table 3).

Looking at the type of offenders, we find that legal persons breaching environmental legislation can expect significantly higher sanctions, while individuals offending in their professional capacity can expect significantly lower sanctions ceteris paribus.

Concerning the variables related to the gravity of the facts, we find that offenders who committed prioritized offenses and offenders who violated the environmental permitting obligation receive significantly higher sanctions, as expected. Also, offenders in cases including civil parties are sanctioned more stringently. Moreover, we note that offenders who committed offenses leading to soil or ground water contamination are sanctioned less severely. Next, as expected, the sanction imposed on offenders who carried out positive actions to reduce the negative effects of their offense was significantly lower. Surprisingly, we find that offenders mentioned to have offended intentionally receive a significantly lower offense. Furthermore, offenders with previous convictions and offenders acting from a financial motive can expect higher sanctions.

Finally, we observe that offenders receive lower sanctions in Brugge and Kortrijk and significantly higher sanctions in Gent for similar offenses.

INSERT TABLE 3 ABOUT HERE

3. Suspended sanction

We start by investigating the probability that a suspended sanction is added to the effective sanction and next what factors determine the level of this suspended sanction. Note that a suspended sanction was added to the effective sanction for 45% of the convicted offenders[11].

Firstly, the higher the effective sanction imposed, the lower the probability that the offender receives a suspended sanction and the lower the level of the imposed suspended sanction. These results suggest that in general the effective sanction and the suspended sanction are used as substitutes. Thus, when the judge in first instance increases the effective sanction, he/she will reduce the suspended sanction and vice versa.

[11] This fact documents a marked evolution in sentencing practices. Twenty years ago, Faure knew only of a handful of environmental cases where the criminal courts pronounced a conviction with suspended sanctions (Faure 1990).

We find, on the one hand, that the probability of receiving a suspended sanction significantly increases for legal persons, for individuals offending within their professional capacity, for longer lasting offenses, for prioritized offenses, for contamination of soil and ground water, for offenders taking positive action to reduce the harm caused by their offense, for intentional offenders, for gain seeking offenders and for offenders tried in Gent. On the other hand, this probability is significantly lower for offenders tried in Brugge, Kortrijk or Oudenaarde.

Next, we turn to the determinants of the level of the suspended sanction. Looking at the types of offenders, we find that judges impose a significantly higher suspended sanction on both natural persons acting within their professional capacity and on legal persons. This result seems to counteract the general substitution trend for offenders that are legal persons since these offenders already receive a higher effective sanction and have a higher probability of receiving a suspended sanction.

The variables concerning the gravity of the facts have a clear impact on the level of the suspended sanction. For offenses that last relatively longer, the suspended sanction is significantly higher. When at least one prioritized offenses was committed, the suspended sanction will also be higher. The same holds for offenses threatening public or private health, cases involving civil parties, offenses involving the environmental permitting obligation as well as those involving surface water contamination. Being prioritized offenses, the presence of civil parties and violations of the environmental permitting obligation already received higher effective sanctions, thus the increased suspended sanctions for these types of offenses are again counteracting the general substitution trend. Stated even stronger, these results indicate a cumulative use of effective and suspended sanctions.

Looking at the factors dealing with the culpability of offenders, we observe that intentional offenders and offenders acting from financial motives receive higher suspended sanctions.

For intentional offenders this corresponds with the general substitution trend, while for the gain seeking offenders this result counteracts this general trend since these offenders also receive higher effective sanctions.

Finally, we find that, for similar offenses, the level of suspended sanctions was significantly lower in 2006.

INSERT TABLE 4 ABOUT HERE

B. Court of Appeal

After the verdict in first instance is given, all parties involved have the opportunity to start the appeal process in which case the case is brought before the Court of Appeal of Gent for our dataset. First we estimate the probability that an appeal is initiated by one or more of the involved parties and next we investigate what case characteristics induce the Court of Appeal to modify the original verdict. Remember that the public prosecutor's office is one of the parties appealing the verdict in all our cases, which implies that the appeal judge is free not only to alleviate but also to strengthen the original sanction.

1. Probability of appeal

While the probability of appeal is not part of the judicial sanctioning decision process, we still need to estimate the probability in order to correct for a potential sample selection bias. As expected, we find that verdicts that impose higher effective sanctions are more likely to be appealed. Next, we observe that the probability of an appeal is significantly higher for cases where the offender is a legal person or a natural person offending in his/her professional capacity, for cases where the offenses threaten the public or private health, cases including civil parties, cases dealing with noise, soil or ground water pollution and also for cases that were tried in the Court of First Instance of Gent. Furthermore, we find that the probability of an appeal significantly decreases for cases concerning prioritized offenses, cases where the

offender took measures to control the damage caused and cases tried in Brugge. Also there seems to be a decreasing probability of appeal over time[12].

2. Changes in effective and suspended sanctions

We now analyze the changes that the appeal court made to the sanctions imposed by the courts of first instance (see table 6).

Several of the judicial policy lines followed by the lower courts are implicitly confirmed by the appeal judge when the initial policy lines are not modified in appeal. Specifically these include:

- the significantly higher effective sanctions imposed on legal persons, defendants with a criminal record, defendants with prioritized offenses, cases that include civil parties and breaches of the environmental permitting obligation;
- the significantly lower effective sanctions imposed on natural persons who committed an offense in the framework of their professional activities, intentional offenders, defendants who undertook positive actions to reduce the negative effects of the offense and offenses concerning soil or groundwater contamination;
- the significantly higher effective sanctions imposed by the Court of First Instance of Gent;
- the significantly higher suspended sanctions imposed on legal persons, prioritized offenses, offenses that caused damage to public or private health, and offenses related to surface water pollution; and
- the significantly lower suspended sanctions imposed on natural persons who committed an offense within their professional capacity.

Several other judicial policy lines followed by the lower courts are modified – strengthened or weakened – by the appeal judge. Analogously to the results obtained from the lower

[12] This observation might be due to a bias in our data collection since the appeal procedure of the later cases might not have been finished in 2007 and would then not be included in our dataset.

courts, we find that the appeal judge also uses effective and suspended sanctions as substitutes: in general, when the appeal judge increases the effective sanction, the suspended sanction is reduced and vice versa.

Moreover, the changes to the effective part of the sanction are primarily related to the gravity of the facts. In cases where the offender was convicted for multiple offenses or for offenses causing damage to vulnerable habitats, fauna or flora, the effective sanction in appeal was significantly lower than the sanction imposed by the lower courts. The same weakening of the imposed effective sanctions was also observed for offenders acting from profit seeking motivations. On the other hand, we observe that defendants who violated the conditions of their environmental permit or who committed offenses related to noise or air pollution received significantly higher effective sanctions in appeal.

Furthermore, turning to the specific results for the changes in suspended sanctions, we find that the suspended sanction increases compared to the verdict in first instance for offenders convicted of violating the obligation to have a valid environmental permit, intentional offenders, profit seeking offenders and offenders who undertook positive actions. The suspended sanction in appeal decreased for offenders with multiple offenses, the longer the offenses lasted, for offenses detected by the Flemish Environmental Inspection Agency, for cases including civil parties and offenders with a criminal record.

INSERT TABLE 5 ABOUT HERE

VI. **Discussion**

The series of estimations described in the previous sections provide a unique picture of judicial lines of policy developed by criminal courts in Flanders concerning the sanctioning of environmental offenses. The policy lines we were able to positively identify are not necessarily the result of deliberate policy choices by the judges, they might also be the result

of unintentional – but real – sanctioning strategies. The estimated policy trends allow us to comment on the validity of the hypotheses we formulated in section 3.

The *first* hypothesis stated that sanctions imposed as a result of more, or potentially more, harmful offenses are expected to be higher than sanctions for less, or potentially less, harmful offenses. Our analysis shows ample evidence to support this hypothesis both for the lower courts and for the appeal court. In cases where civil parties claimed to be damaged by the offense, for instance, both the effective and suspended sanctions were significantly higher, all else equal. Also, defendants that undertook positive actions to limit the damage caused by their actions are treated more leniently by courts. Offenses that lasted longer or that posed a threat to public health received higher suspended sanctions. Moreover, prioritized offenses are consequently treated harsher by courts. Thus the first subcriterion of the sanctioning criterion stressed by the Supreme Court, namely the gravity of the facts, is clearly recognizable in our empirical findings for each of the three policy choices: the probability of postponement of the conviction, the level of the effective sanction and the level of the suspended sanction. Moreover, this attention paid to - actual and possible - harm is completely in line with law and economic insights on the determinants of the optimal penalty.

Next, the *second* hypothesis stated that the stringency of sanctioning decisions is expected to depend positively on the profitability of the offense in addition to the positive effect of the gravity of the harm caused. We expect sanctions to depend on both the harm caused by the offender and the gain obtained from the offense for two reasons. First, the two subcriteria emphasized by the Supreme Court are exactly the gravity of the facts as well as the culpability of the offender. Secondly when judges pursue a combination of different objectives such as deterrence, minimization of social costs and justice, law and economic models show that the optimal penalty should depend both on harm and gain. We already commented on the evidence supporting the second part of this hypothesis, namely the effect

of harm on the imposed sanction, when discussing the first hypothesis. The evidence related to the first part is less direct, since our proxy for the possible gain associated with the offense (namely GAIN-SEEK) is not fully adequate. Nonetheless, we find that the courts of first instance are likely to impose higher effective and suspended sanctions for offenders thought to have acted from a financial motive. Thus, our second hypothesis seems to hold for the lower courts in Flanders, implying an objective function that includes both deterrence and social costs considerations. However, looking at the appeal court, this observation no longer holds. The appeal judge lowers the effective sanctions for gain seeking offenders and substitutes it by a higher suspended sanction. Thus, our second hypothesis does not seem to hold to the same extent for the appeal court and sanctions in appeal, especially effective sanctions, are correlated more with the harm caused than with the possible gain related to the offense.

We can now turn to the *third* hypothesis, which stated that the effect of objectively verifiable characteristics related to the gravity of the facts and/or the level of culpability of the offender on the level of the imposed sanction is expected to dominate more subjective or less tangible case characteristics. Again we find some evidence to support this hypothesis. Offenses of which the environmental impact is not directly observable, such as those related to soil and ground water contamination, can expect lower effective sanctions in lower courts, while offenses with more directly observable effects, such as waste, noise and odor nuisance, have a significantly lower probability to lead to a postponement of the conviction. Moreover, the appeal court confirms these policy lines developed by lower courts in Flanders. Turning to the measures of culpability in our analysis, we find that the objective fact of having a criminal record strongly influence the probability of being convicted and of receiving a higher effective sanction at lower courts. However, the more subjective estimation of culpability (through the variable INTENT) has no influence on the level of the effective

sanction, but significantly increases the level of the suspended sanction in courts of first instance. Again, the Court of Appeal seems to confirm these policy lines, except for the fact that the appeal judges significantly reduce the suspended sanction imposed on offenders with a criminal record, thus seeming to attach more importance to the specific guilt of the defendant in the case under consideration. These findings might be the result from the lack of environmental specialization in Flemish courts.

Further, our *fourth* hypothesis stated that, if suspended sanctions are used as a less stringent substitute for effective sanctions, the stringency of effective and suspended sanctions are expected to be negatively correlated. In general, the significant negative correlation found between effective and suspended sanctions both at lower and higher courts supports this hypothesis. This result points to a common trend of using suspended sanctions as substitutes for effective penalization. However, some remarkable exceptions surface. Legal persons, namely firms, are treated relatively more harshly - possibly due to their deeper pockets - and the increased probability of receiving a higher suspended sanction on top of a higher effective sanctions indicates a cumulative use of suspended sanctions by courts of first instance in order to increase specific future deterrence. Suspended sanctions are also used as a sign of additional stringency by lower courts for prioritized offenses, offenses related to the environmental permit obligation, offenses with civil parties involved and offenders acting from gain seeking motives. The Court of Appeal of Gent confirms the cumulative use of suspended and effective sanctions for legal persons and prioritized offenses. Offenses related to the environmental permit obligation are, however, treated even more harshly by the appeal judges since the suspended sanctions rise again significantly. Moreover, offenders who undertook positive actions to reduce the negative effects of their offense and intentional offenders seem to receive higher suspended sanctions in appeal.

The *fifth* hypothesis stated that judgments from the courts of first instance are more likely to reflect the core values of environmental law rather than those of criminal law, while judgments from the court of appeal are more likely to reflect the core values of criminal law rather than those of environmental law. Generally, the environmental case law created by the courts of first instance reflects the trends prevailing in environmental policy: 1) the gravity of the facts in terms of actual and/or potential harm for the individual and the environment weighs heavily on the sanctioning decision, 2) prioritized offenses, including the environmental permit obligation, are rigorously convicted, and 3) gain seeking behavior is stringently deterred. Thus, we find that the criminal judges of the courts of first instance reflect the core values of environmental law, namely protection of the environment for the sake of individuals and of nature as such, more closely than those of criminal law. Looking at the sanctioning decisions at the Court of Appeal, we find a different focus since the basic criterion related to the seriousness of the offense is interpreted differently. Appeal judges focus on the degree of actual damage and contamination that caused real negative effects on individuals and the environment. Moreover there is evidence of a more pronounced anthropocentric emphasis than in lower courts. Nuisance problems such as noise and dust (large part of air pollution cases) are punished more severely, while damage to nature leads to lower effective sanctions. Thus the judicial policy of the appeal judge shows recognition of the core values of environmental law in his protection of individuals against damage and nuisance. However, this policy also relates strongly to one of the core values of classic criminal law, namely the protection of the physical integrity of the citizen. The environmental case law produced by the court of appeal can be situated at the exact point where environmental and criminal law have synergies. For this reason, our analysis paints a picture of judges of first instance as criminal judges enforcing environmental law. However, at the

appeal level, a synthesis of environmental and classic criminal law is made. Therefore, we cannot unambiguously confirm of our fifth hypothesis.

Finally, we can comment on some additional findings. The mild treatment of individuals who committed offenses within their professional capacity is noteworthy, especially when confronted with the observation that they are treated milder than individuals committing similar offenses in their private capacity. This fact might be explained by the fact that individuals offending in their professional capacity are more likely to be simultaneously prosecuted with a legal person (49% versus 13%), suggesting a trade-off in punishing more than one offender simultaneously. Moreover, our data do not reveal temporal differences in the verdicts. However, this might be due to the rather limited study period. On the other hand, we observe some marked difference in sanctioning decisions over judicial districts. Offenders who are judged in Brugge or Kortrijk are clearly better off, while those judged in Gent receive significantly higher sanctions. Even though the relatively stricter verdicts of the court in Gent are appealed to more often, the Court of Appeal of Gent seems to confirm these stricter sanctions in general.

VII. **Conclusion**

Judicial decision making is often treated as a black box and empirical evidence on criminal environmental sanctioning decisions is extremely scarce. Therefore, we find that our analysis of environmental case law in Flanders paints an intriguing and insightful picture of judicial lines of policy. The sanctioning policy of judges is varied as well as consistent. Judges can decide to postpone convictions for cases deemed to justify mildness. They carefully balance effective and suspended sanctions: in general using them as substitutes, but in specific cases opting to use them cumulatively. Overall, judges in lower courts balance environmental and criminal law and aim at protecting individuals and their possessions as well as the

environment. Next to environmental law, the appeal court seems to be influenced more by classic criminal law as shown, for instance, by its treatment of culpability.

Moreover, the results provide evidence of several assumptions or predictions formulated in existing literature on environmental sanctioning. Sanctions are increasing with the level of harm caused. Firms are sanctioned more stringently than individuals. Repeat offenders and intentional offenders receive higher sanctions. Furthermore, we find that judges balance the deterrence effects with the social costs of imposing sanctions for environmental crime. However, the results also provide insights that are not generally incorporated in the (law and) economic literature, specifically regarding the judicial use of suspended and effective sanctions as instruments to imposed milder as well as stricter sanctions. The use of suspended sanctions is especially intriguing and deserves more attention in future work. Suspended sanctions are generally seen as a sign of leniency when they replace effective sanctions, however they still deter future offenses. Interestingly, suspended sanctions can also be used to increase the stringency of the imposed sanction through a cumulative use of both suspended and effective sanctions. The role of suspended sanctions as either carrot or stick certainly values additional research efforts.

To conclude, the current study provides a unique view of sanctioning decisions by criminal judges. The generality of the results is corroborated by the evidence we provide on generally used assumptions and models. Nonetheless, it would be very interesting to see a similar analysis of environmental case law in other jurisdictions in order to distinguish between general and specific results. Moreover, the analysis points at an important policy question, namely the need for specialized environmental courts. It would be interesting to find an indication of which findings result from the lack of specialization of the Flemish courts and how judicial policy might change if specialization occurred. Furthermore, it would be interesting to look at the interaction between the public prosecutor and the criminal judge. At

least two dimensions seem relevant: firstly, the relation between the type and level of the sanction requested by the public prosecutor and the type and level of the sanction imposed by the criminal judges and secondly, the impact of actual judicial policy relating to environmental sanctioning on the prosecution policy.

Appendix A: Legislation included in the dataset

Our study focuses on environmental pollution legislation. The selection of environmental case law in the period 2003 – 2007 includes all cases where at least one accusation concerned a breach of one of the following legislative acts cooperation agreements or associated implementing decrees: Air Pollution Act 1964, Pesticides Act 1969, Surface Water Act 1971, Noise Pollution Act 1973, Flemish Waste Act 1981, Flemish Groundwater Act 1984, Flemish Environmental Permitting Act 1985, Non-ionizing Radiation Act 1985, Environmental Tax Act 1993, Ionizing Radiation Act 1994, Ecolabel Act 1994, Flemish Environmental Policy Act 1995, Product Standards Act 1998, Marine Environment Act 1999 and Seveso II Cooperation Agreement 1999

Breaches of exploitation permits based on the Labor Safety Decree 1946 (Title 1. *Regime of installations categorized as dangerous, unhealthy or hazardous.* B.R. 11 February 1946 on the General Code of Labor Protection; *B.S.*, 3 April 1946) are also included since this legislation precedes the current environmental permit based on the Flemish Environmental Permitting Act 1985; a large number of firms in Flanders still work with such Labor Safety permits. Moreover, the study also includes legislation that was recently cancelled, namely the Manure Act 1991, Soil Cleanup Act 1995 and the Packaging Waste Cooperation Agreement 1996. Those acts were replaced by, respectively, the Manure Act 2006, the Soil Act 2006 and the Packaging Waste Cooperation Agreement 2008, whom all three are strongly inspired by the older laws they replace.

Appendix B: Calculation equivalent monetary value of prison sentences

In Billiet et al. (2009), we compare differences in maximum fines with differences in maximum imprisonment sentences for different legislations, to deduce the implicit monetary value that the lawmaker assigns to an imprisonment sentence of certain duration. We scale all these monetary values on a monthly basis, such that they can be compared among different types of regulations. The results of these calculations are shown below for the different environmental laws in our dataset that are actually violated by Flemish offenders.

INSERT TABLE B1 ABOUT HERE

Next we assume that the monetary value of a monthly imprisonment sentence decreases with the length of the total imprisonment sentence imposed. The additional deterrence effect of an effective imprisonment sentence is likely to be the strongest for the first months of an imprisonment sentence and to marginally decrease for an additional month in case of a sentence of a longer duration. This logic is also apparent in the sentences for violation of the Fertilizer Act. Therefore, we established a function that assigns a monetary value to a marginal increase in the jail sentence:  . This function is then used to transform an effective imprisonment sentence into an equivalent monetary value.

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Table 1 : Main criminal sanctions (individuals)

Main criminal sanctions	*First instance*		*Appeal*	
	Number of convicts	% of convicts	Number of convicts	% of convicts
Only fine	895	87,49 %	117	82,40 %
Only prison sentence	1	0,10 %	3	2,11 %
Prison sentence *and* fine	102	9,97 %	18	12,68 %
Community service	17	1,66 %	1	0,70 %
Other	8	0,78 %	3	2,11 %
Total number of convictions	1023		142	

Table 2 : First instance: Probit estimation of the probability of postponement of the conviction

Dependent variable: POST	Number of observations = 1311		
Explanatory variables	Coefficient	P-value	Marg.effect
CONSTANT * **	**-1,081**	**0,000**	
FIRM	-0,003	0,985	
PROF* **	**0,345**	**0,007**	**0,061**
PROVEN ACC	0,007	0,824	
DURATION	0,000	0,581	
EPA	0,007	0,963	
PRIORITY * **	**-0,436**	**0,007**	**-0,064**
**NATURE ** **	**0,616**	**0,022**	**0,15**
HEALTH	-0,489	0,191	
CIVIL PARTY	-0,248	0,130	
PERMIT	-0,062	0,659	
**PERMIT-COND ** **	**0,275**	**0,043**	**0,049**
WASTE * **	**-0,433**	**0,001**	**-0,076**
SOIL-GROUND	-0,142	0,407	
**NOISE ** **	**-0,341**	**0,054**	**-0,05**
ODOR * **	**-0,978**	**0,009**	**-0,091**
AIR	-0,240	0,470	
WATER	0,074	0,645	
POSITIVE * **	**0,420**	**0,000**	**0,083**
RECORD * **	**-0,993**	**0,000**	**-0,105**
INTENT	-0,246	0,157	
GAIN-SEEK * **	**-0,734**	**0,000**	**-0,091**
**BRUGGE ** **	**0,350**	**0,046**	**0,07**
GENT	0,150	0,267	
KORTRIJK	-0,015	0,940	
OUDENAARDE	0,094	0,656	
**WESTHOEK ** **	**0,413**	**0,019**	**0,087**
**YEAR04 ** **	**0,290**	**0,049**	**0,056**
YEAR05	0,013	0,927	
**YEAR06 ** **	**0,307**	**0,030**	**0,057**
	Limit 0,35	Benchmark	
Pseudo R^2	0,17	0,00	
% Correct	85%	85%	
% Correct 1	31%	0%	
% Correct 0	95%	100%	

*** = significant at 1% level / ** = significant at 5% level / * = significant at 10% level

Table 3: First instance: OLS estimation of the level of the effective sanction (sample selection)

Dependent variable LN(EFFSAN)	Number of observations =1113	
Explanatory variables	Coefficient	P-value
CONSTANT* **	**5,852**	**0,000**
FIRM*	**0,423**	**0,060**
PROF * **	**-0,613**	**0,003**
PROVEN ACC	0,060	0,218
DURATION	0,00012	0,252
EPA	0,208	0,386
PRIORITY**	**0,526**	**0,021**
NATURE	0,028	0,945
HEALTH	0,298	0,362
CIVIL PARTY* **	**0,637**	**0,002**
PERMIT * **	**0,624**	**0,002**
PERMIT-COND	0,194	0,366
WASTE	0,100	0,695
SOIL/GROUND* **	**-0,908**	**0,002**
NOISE	0,001	0,998
ODOR	0,009	0,982
AIR	0,009	0,982
WATER	0,404	0,145
POSITIVE * **	**-1,143**	**0,000**
RECORD* **	**0,787**	**0,003**
INTENT *	**-0,389**	**0,098**
GAIN-SEEK * **	**1,365**	**0,000**
BRUGGE * **	**-1,062**	**0,001**
GENT*	**0,322**	**0,080**
KORTRIJK * **	**-1,383**	**0,000**
OUDENAARDE	0,027	0,930
WESTHOEK	0,399	0,171
YEAR04	-0,122	0,586
YEAR05	0,258	0,202
YEAR06	0,086	0,688
LAMBDA[14]	-0,066	0,943
Adj R^2	0,27	
F-test (p-value)	14,49 (0,00)	

*** = significant at 1% level / ** = significant at 5% level / * = significant at 10% level

[14] The variable LAMBDA corrects for a possible *sample selection bias* that could occur if cases with a postponement significantly differ from cases with a conviction.

Table 4: First instance: Estimation of the probability of imposing a suspended sanction and its level

	Dependent variable: PROBSUS			Dependent variable: LN(SUSSAN)	
	Number of observations = 1115			Number of observations = 505	
Explanatory variables	Coefficient	P-value	Marg. effect	Coefficient	P-value
CONSTANT	1,925	0,259		**5,211**	**0,000**
LN(EFFSAN)	**-0,405**	**0,000**	**-0,16**	**-0,194**	**0,018**
FIRM	**0,247**	**0,053**	**0,19**	**0,550**	**0,082**
PROF	**0,350**	**0,002**	**0,14**	**0,538**	**0,039**
PROVEN ACC	0,001	0,964		0,057	0,366
DURATION	**0,00025**	**0,000**	**0,000099**	**0,00048**	**0,000**
EPA	0,154	0,311		0,379	0,207
PRIORITY	**0,428**	**0,001**	**0,17**	**0,945**	**0,000**
NATURE	0,340	0,162		-0,471	0,335
HEALTH	-0,055	0,781		**1,128**	**0,005**
CIVIL PARTY	0,176	0,151		**0,864**	**0,001**
PERMIT	0,105	0,405		**0,452**	**0,085**
PERMIT-COND	-0,138	0,276		-0,202	0,452
WASTE	0,094	0,497		0,228	0,414
SOIL/GROUND	**0,317**	**0,085**	**0,13**		
NOISE	0,083	0,615		-0,088	0,793
ODOR	0,199	0,369		-0,179	0,707
AIR	0,042	0,884		-0,629	0,307
WATER	0,083	0,645		**1,006**	**0,006**
POSITIVE	**0,266**	**0,027**	**0,11**	-0,091	0,712
RECORD	-0,033	0,792		0,369	0,196
INTENT	**0,307**	**0,035**	**0,12**	**0,742**	**0,010**
GAIN-SEEK	**0,389**	**0,002**	**0,15**	**0,879**	**0,002**
BRUGGE	**-0,870**	**0,000**	**-0,31**	-0,667	0,172
GENT	**0,196**	**0,079**	**0,08**	0,261	0,278
KORTRIJK	**-0,720**	**0,000**	**-0,27**	-0,445	0,324
OUDENAARDE	**-0,601**	**0,002**	**-0,2**	-0,178	0,718
WESTHOEK	-0,196	0,217		-0,181	0,631
YEAR04	-0,036	0,767		0,307	0,283
YEAR05	-0,004	0,969		-0,205	0,452
YEAR06	-0,115	0,319		**-0,451**	**0,102**
LAMBDA				**2,529**	**0,000**
Pseudo R^2	0,24	0		Pseudo R^2	0,46
% Correct	73,2%	54,7%		F-test (p-value)	14,82 (0,00)
% Correct 1	61,6%	0,0%			
% Correct 0	82,2%	100,0%			

Table 5 : Appeal : OLS estimation of the changes in effective and suspended sanctions

	Dependent variable DIF-EFFSAN Number of observations =109		Dependent variable DIF-SUSSAN Number of observations = 109	
Explanatory variable	Coefficient	P-value	Coefficient	P-value
CONSTANT	-12579	0,795	16505	0,728
DIF-EFFSAN			**-0,284**	**0,002*** **
FIRM	2321	0,905	19096	0,315
PROF	-10719	0,537	10900	0,522
PROVEN ACC	**-16199**	**0,000*** **	**-14655**	**0,000*** **
DURATION	14	0,266	**-35**	**0,004*** **
EPA	4059	0,824	**-64158**	**0,000*** **
PRIORITY	-17776	0,506	-24648	0,347
NATURE	**-113352**	**0,006*** **	44258	0,292
HEALTH	-11709	0,732	3775	0,910
CIVIL PARTY	-31079	0,106	**-35414**	**0,063***
PERMIT	12012	0,554	**60725**	**0,002*** **
PERMIT-COND	**37941**	**0,025** **	-22944	0,175
WASTE	34889	0,117	11963	0,587
SOIL/GROUND	35851	0,147	26649	0,275
NOISE	**66346**	**0,010*** **	20039	0,442
ODOR	-16152	0,660	-1270	0,972
AIR	**71428**	**0,046** **	49748	0,162
WATER	45003	0,112	12850	0,647
POSITIVE	-21052	0,537	**59191**	**0,077***
RECORD	11747	0,519	**-45257**	**0,011** **
INTENT	17685	0,314	**29734**	**0,085***
GAIN-SEEK	**-40634**	**0,049** **	**34265**	**0,095***
GENT	-22575	0,234	-12571	0,501
LAMBDA	4173	0,828	467	0,980
Adj R^2	0,34		0,37	
p-value F-test	0,00		0,00	

*** = significant at 1% level / ** = significant at 5% level / * = significant at 10% level

TABLE B1: Overview maximum penalties in relevant legislation

Legislation	Maximum boundary of fine for natural body (1)	Maximum boundary of fine for legal body (2)	Implied monetary value of jail sentence (3) = (2) – (1)	Implied monetary value of monthly jail sentence (4) = (3)/# months
Surface Water Act 1971	€27500	€66000	6 months=€38 500	€6417
Noise Pollution Act 1973	€27500	€66000	6 months -> €38 500	€6417
Fl. Waste Act 1981	€55 000 000	€110 000 000	5 years -> €55 000 000	€916 667
Fl. Groundwater Act 1984	€660 000	€55 000	5 years -> €605 000	€10 083
Fl. Environmental Permitting Act 1985	€550 000	€1 100 000	1 year -> €550 000	€45 833
Fl. Manure Act 1991	€275 000 €412 500 €550 000	€550 000 €825 000 €1 100 000	2 months -> €275 000 6 months -> €412 500 1 year -> €550 000	€137 500 €68 750 €45 833
Fl. Soil Cleanup Act 1995	€55 000 000	€110 000 000	5 years -> €55 000 000	€916 667
Fl. Environmental Policy Act 1995	€55 000 000	€110 000 000	5 years -> €55 000 000	€916 667