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Investigator Self-Interest in the Environmental Process

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Abstract

The Swedish Environmental Code states that certain potentially harmful activities must not be pursued without a permit. When applying for a permit, the applicant shall submit an environmental impact assessment, which describes the effects that the activity might have on the environment. This article discusses the risk that investigator self-interest decreases the adequacy of environmental impact assessments. The article also presents a newly made empirical study of whether and how arguments about investigator self-interest are considered and taken on board by Swedish environmental courts.

Keywords: environmental impact assessment, law and science, conflict of interest, environmental process.

1. Introduction

The Swedish Environmental Code states that certain potentially harmful activities, such as mining, paper production, and fish farming, must not be pursued without a permit.[1] When applying for a permit, the applicant shall submit an environmental impact assessment, EIA, which describes the effects that the activity might have on the environment.[2] This requirement specifies the code's general demand that a person who pursues an activity must demonstrate that he possesses sufficient knowledge to protect the environment from detrimental impact.[3] The impact assessment is meant to establish and describe the planned activity's direct and indirect effects on people, animals, plants, land, water, air, the climate, the landscape, and the cultural environment, on the management of land, water and the physical environment in general and on other managements of materials, raw materials and energy.[4] It goes without saying that it often takes comprehensive scientific expertise and inquiry to make an assessment of this kind. Occasionally, relevant expertise can be found within the organization that applies for the permit, but quite often the applicant will need to appoint external scientific expertise.

The fact that an expert is appointed by one of the parties is commonly regarded as a threat to the expert's impartiality. It is often pointed out that there is a risk that the party has hired an expert whose opinion is "available to the highest bidder", or at least deliberately picked an expert whose views support her cause. Even if the party has not exercised any direct control over the expert's testimony, the payer-provider relationship constitutes a secondary interest which risks influencing the expert's judgment.[5] Clearly, the

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[1] Swedish Environmental Code (SEC) chapters 9, 11 and 12, förordning (1998:899) om miljöfarlig verksamhet och hälsoskydd, and miljöprövningsförordning (2013:251).

[2] SEC, chapter 6, section 1.

[3] SEC, chapter 2, sections 1–2.

[4] SEC chapter 6 Section 3.

[5] See, for example, Ekelöf, P-O, Edelstam, H., and Heuman, L., *Rättegång IV*, Stockholm 2009, p. 298, Pattersson, M.R., "Conflicts of Interest in Scientific Expert Testimony", *William and Mary Law Review*, 40.4, 1998–1999, p. 1313–1394 and SOU 1926:33, III p. 179.

risk that secondary interests influence judgment is at least as great if the investigator herself is a party to the process. It can be noted that many institutions restrict or exclude the participation of advisors with conflicts of interest in the matter at hand.[6] The fact that Swedish environmental law (like many other legal rules) entrusts the applicant and/or her experts with providing a significant share of the decision basis, suggests that the legislator has assumed either that these conflicts of interest are unproblematic, or that they can be satisfactorily handled within the permit process. This article discusses the adequacy of these assumptions. In section two, we discuss the risk that investigator self-interest leads to deficiencies in environmental impact assessments. In section three, we discuss whether the legal system provides instruments to manage investigator self-interest, and whether the legal process can be expected to detect the deficiencies that such interests might lead to. In section four, we present a newly made empirical study of whether and how arguments about investigator self-interest are considered and taken on board by the Swedish environmental courts. In section five we make some concluding remarks and suggest paths for further research.

2. Conflicts of interest and the risk for deficiencies in the expert's assessment

Although problems associated with conflicts of interest are discussed in many contexts, there is no generally accepted definition of the notion. According to Dennis Thompson's often-cited definition, a conflict of interest is

> "a set of conditions in which professional judgment concerning a primary interest (such as a patient's welfare or the validity of research) tends to be unduly influenced by a secondary interest (such as financial gain)."[7]

It is important to note that Thompson's definition – like many others – does not require that secondary interests have an *actual* influence on the investigator's judgment; it is sufficient that secondary interests create a *risk* for such influence, given the current state of knowledge of how secondary interests operate. This suggests that the risk itself is regarded as a reason for concern, which is a plausible approach, considering that concrete influence on an investigator's judgment can be hard to detect in a particular case.

In permit processes, the primary interest can be defined as the interest of obtaining an adequate assessment of the activity's impact on the environment. Essentially, the secondary interest could be any other interest that the investigator might have, and which tends to unduly influence her assessment. Below, we will use the term "self-interest" to refer to the investigator's secondary interests. To adjust Thompson's definition to the subject matter of this article, we will also replace "undue influence" by "unduly increases the risk for deficiencies in the investigator's assessment of the activity's environmental impact".[8] This gives us the following definition:

*An investigator has a **conflict of interest** if the investigator has a self-interest, which unduly increas-*

[6] See e.g. guidelines developed by WHO; "Guidelines for Declaration of Interests (WHO Experts)" http://intranetapps.euro.who.int/intranet/documents/HAN/Contracts__Declaration_of_interests.htm (visited 150925), and the guidelines developed by seven Swedish authorities, presented in "Addressing Conflicts of Interest in Appointing External Experts" http://www.socialstyrelsen.se/SiteCollectionDocuments/eng-bilaga.pdf (visited 151209).

[7] Thompson, D.F., "Understanding Financial Conflicts of Interest", *New England Journal of Medicine*, 329(8), 1993, p. 573–576.

[8] The term "undue" is non-redundant since some legitimate secondary interests, such as the interest of not spending more time on an investigation than paid for, can likewise increase the risk for deficiencies in the assessment.

es the risk for deficiencies in the investigator's assessment of the activity's environmental impact.

Common sense tells us that a person's self-interests tend to influence her behavior, and that investigator self-interest is a potential problem. Several scientific studies on medical research and practice support the assumption that self-interest indeed risks leading to deficiencies in the expert's assessment. For example, it has been demonstrated that gifts and economic support from industry influence medical practitioners' treatment decisions. Similarly, contacts with industry have been seen to influence the methodological choices that scientists make, as well as the conclusions they eventually draw. Hence, researchers funded by pharmaceutical companies typically find the drugs they study to be more efficient and less associated with detrimental side-effects, than research without such funding.[9] Moreover, people tend to underestimate the influence that conflicts of interest have on them.[10] It is documented that physicians erroneously tend to believe that contacts with industry do not influence their behavior,[11] and it has been argued that self-interests, unlike professional responsibilities, are processed unconsciously and therefore difficult to eliminate or correct for.[12] More research is needed on how different kinds of self-interest work and how powerful they are. However, recalling that the environmental impact assessment is a means to promote a sustainable development and prevent damage to human health and the environment, and that this area of law is normally governed by the precautionary principle, it seems wise to be very attentive of investigator self-interest and the risks that such interests create in the environmental process.

3. Investigator Self-Interest in the Environmental Permit Process

As we have seen, Swedish environmental law requires the applicant to submit an environmental impact assessment. If the applicant has produced the investigation without the assistance of external experts, the risk that the investigation is influenced by the applicant's self-interest seems obvious. However, the problem with investigator self-interest does not disappear just because the applicant hires an external investigator (consultant) to conduct the investigation. Environmental impact assessments are often very costly[13] and are hence important assignments for the consultants that are hired to conduct them. Normally, therefore, the consultant wants to make the applicant – the client – content. Moreover, and as will be illustrated below, the relationship between the consultant and the applicant is often long-lasting and frequently includes other, larger assignments too.[14] The ensuing risk that

[9] See, for example, Barnes, M. and Florenico, P.S., "Financial Conflicts of Interest in Human Subjects Research: the Problem of Institutional Conflicts", *Journal of law, medicine and ethics*, 2002, 390–402, Bekelman, J., Li, Y. and Gross, C., "Scope and Impact of Financial Conflicts of Interest in Biomedical Research, a Review", *Journal of the American Medical Association*. 2003, 4,454–465; Lo, B. och Field, M., (Eds.) *Conflict of Interest in Medical Research, Education and Practice*, Washington, National Academies Press, 2009; Appelbaum, P.S. and Gold, A., "Psychiatrists' Relationships with Industry: the Principal-Agent Problem", *Harvard Review of Psychiatry*, 2010, 18, 255–265, Dahlman, C. and Wahlberg, L., "Appeal to Expert Testimony: a Bayesian Approach" in C. Dahlman and T. Bustamente (eds.) *Argument Types and Fallacies in Legal Argumentation*, Springer 2015.

[10] Moore, D. A., Tanlu, L. and Bazerman M. H., "Conflict of Interest and the Intrusion of Bias", *Judgement and Decisionmaking*, 2010, 5, 37–53.

[11] Gold, A. and Appelbaum, P.S., "Unconscious Conflict of Interest: a Jewish Perspective", *Journal of Medical Ethics*, 2011, 37, 402–405.

[12] Moore, D. A. and Loewenstein, G., "Self-Interest, Automaticity and the Psychology of Conflict of Interest", *Social Justice Research*, 17, 2004, 189–202.

[13] http://www.svensktnaringsliv.se/fragor/regelkrangel/tillstand-for-gruva-tog-sju-ar_553811.html (visited 151210).

[14] Hedlund, A. and Kjellander, C., *MKB: Introduktion till miljökonsekvensbeskrivning*, Lund, Studentlitteraur, 2007,

hired consultants produce unreliable environmental impact assessments is not just theoretical – there are many accounts of consultants who have felt pressured to present an assessment that gives a favourable impression of the applicant's project.[15]

The risk that investigator self-interest impacts the environmental impact assessment brings with it the risk that court decisions are based on incomplete or erroneous facts and assessments, which – in turn – risk damaging not only the environment but also the public's confidence in the process. In law, conflicts of interest are often managed *ex ante*, by rules that disqualify a person with secondary interests from participating in a decision. Thus, according to Swedish administrative law, factors such as family relations, interests in the decision's outcome and other similar circumstances that undermine the confidence in an administrator, are treated as reasons for disqualification.[16] Similar rules apply to judges, court appointed experts and other administrators that are involved in a decision, but they do *not* apply to experts that are appointed by the parties, or to the parties. Rules for disqualification can hence not be adduced to disqualify neither an applicant, nor a consultant who has been hired by the applicant, from conducting the investigation.

The fact that rules for disqualification do not hinder parties or party-appointed experts to conduct the investigation raises the question whether investigator self-interest can instead be satisfactorily managed *ex post*, i.e. whether the environmental process has the capacity to detect deficiencies in the investigation that result from such interests. The environmental process has an open character and is designed to include participation by stakeholders and relevant experts. While preparing the environmental impact assessment, the applicant must consult with public authorities and private parties.[17] Before the legal trial begins, the public is invited to comment on the application and the impact assessment.[18] During the trial, public authorities, such as the National Environmental Agency and the Fishery Agency, and private parties that are likely to be affected by the planned activity, such as neighbours, have a right of action. Moreover environmental courts consist not only of legally qualified judges but also include expert members with scientific training and experience. Hereby, the process allows for review from various perspectives, including review of other experts. An important question is therefore whether the environmental process's capacity to detect deficiencies in the consultant's assessment makes redundant *ex ante* approaches to investigator self-interest.

Some deficiencies, such as erroneous calculation, choice of inappropriate statistical method, omission of relevant alternatives or absence of appropriate investigations, are relatively easy to detect. Others, such as excluded results, biased measurements and fabricated data, are much more difficult for an external reviewer to identify, even if she too is an expert within the particular domain. It is a well-known fact within the scientific community that peer review processes are unlikely to detect flaws in scientific research.[19] An empirical study found that peer reviewers succeed in detecting less than one third of major errors.[20] In this light, and considering the fact

p. 128 f.

[15] Morgan, R.K. *Environmental Impact Assessment, a Methodological Perspective*, Dordrecht, Kluwer, 1998, p. 262.

[16] Administrative Act (1986:223), sections 11–12.

[17] SEC chapter 6, section 4.

[18] SEC chaper 6, section 8.

[19] See e.g., Hardwig, J., "The Role of Trust in Knowledge", *The Journal of Philosophy*, 1991, 88, 693–708.

[20] Schroter, S., Black, N., Evans. S., Godlee, F., Osorio, L. and Smith, R., "What Errors do Peer Reviewers Detect, and Does Training Improve their Ability to Detect them?", *Journal of the Royal Society of Medicine*, 2008, 101, 507–514.

that expert members of the environmental courts often lack relevant specialization, it appears too optimistic to expect the legal process to detect all serious deficiencies that investigator self-interest might cause in an impact assessment. We therefore conclude that the open character of the environmental process does *not* make *ex ante* management of investigator self-interest redundant.

Now, rules for disqualification do not exhaust the means for *ex ante* management of investigator self-interest. According to the principle of free evaluation of evidence, Swedish courts are free to evaluate the evidence presented to them. Hence, environmental courts may take evidence of investigator self-interest into account when they evaluate the investigator's assessment. However, so far, little is known of whether and how environmental courts do this in practice. In the next section, we will therefore present a newly made empirical study of how arguments about investigator self-interest are considered and taken aboard by Swedish environmental courts.

4. Arguments about Investigator Self-Interest in the Environmental Process

The discussion so far has shown that investigator self-interest risks influencing the investigator's assessment of an activity's environmental impact. We have also seen that the legal process cannot be expected to detect all deficiencies that investigator self-interest might cause in an impact assessment. Hence, there is a risk that investigator self-interest – if ignored – leads to permit decisions on false premises. This raises the question in what ways courts take arguments about investigator self-interests into account when they evaluate the investigation presented by the applicant. To get an idea of what the answer to this question might be, we set out to investigate whether and how arguments about investigator self-interest are considered and taken aboard by Swedish environmental courts.

We used Karnov database to search for cases in which a private party (other than the applicant) argued that an investigator involved in the environmental impact assessment had a self-interest. The database allowed us to search among cases that were decided by the environmental courts[21] since 1999, provided that the Supreme Environmental Court[22] has reviewed them. Because our study is concerned with issues of fact, we included only verdicts from the environmental courts.[23] To find relevant arguments, we searched the material using a total of 12 keywords relating to investigator self-interest.[24]

A search of this kind is unable to find arguments that the parties put forward during the process but that the courts do not include in their written judgments; finding such arguments would have required a different methodological approach.[25] Nor could our search detect arguments that do not make use of any of our keywords. Consequently, another set of keywords might have detected other or more relevant arguments. However, it should be noted that one of our keywords, *opartisk* [impartial], was present in almost every relevant case that we found, (including most of the arguments identified by the other 11 keywords).[26] This suggests that the keyword *opartisk* is very effective, and that add-

[21] Mark- och miljödomstolarna.

[22] Mark- och miljööverdomstolen. The final search was made 150416.

[23] We did not find anything in the Supreme Environmental Court's reviews indicating that the environmental courts' treatments of investigator self-interest were relevant for the leaves to appeal. Therefore, we think that our way of selection is adequate and acceptable for the purpose of this study. However, and as stressed below, we recognize the need for more comprehensive studies.

[24] The following Swedish keywords were used: opartisk, partisk, egenintresse, intressekonflikt, oberoende utredning, oberoende expert, oberoende part, oberoende konsult, oberoende granskning, oberoende bedömning, oberoende mätning and oberoende miljögranskare.

[25] See section 5 below.

[26] See the next note.

ing more keywords would not have given many more relevant hits.

Our search resulted in hits in more than 200 cases. Many of the hits were unrelated to the research question. However, we found 21 cases with arguments of the kind searched for.[27] Some of these arguments are mere demands for an "impartial investigation". Many of the arguments we found, however, are more explicit. Indeed, some arguments seem meant to convince the courts about the general risk that investigator self-interest influence the assessment:

> "An impact assessment conducted by the wind power company is not objective. Results can be distorted, numbers manipulated and data omitted. We simply don't trust the information."[28]

Other arguments draw attention to specific circumstances that are claimed to undercut the investigator's credibility in the particular case. For example, several arguments point out that there is a more substantial business relation at hand between the hired investigator and the applicant, than that which normally holds between an applicant and her consultant:

> "For more than two decades now, the Mining company [the applicant] has contracted NK [the external investigator hired to make the impact assessment] to measure vibrations and make inspections. What NK does and says is to be regarded as a plea by the Mining Company."[29]

> "The reliability of HydroGIS [the external investigator hired by the applicant] can be called in question, since HydroGIS does not only represent the applicant, but was also previously engaged by the Municipality of Orust to investigate the seabeds."[30]

> "The investigations have been conducted by NCC [a company contracted to carry out the construction works if the application was granted]. They should have been made by an impartial investigator."[31]

Other arguments try to demonstrate that secondary interests have had an effect on the investigator's behavior in the case at hand. This is the case in our next example, where it is argued that the absurdity of the investigator's statement reveals that the investigator's reasoning is affected by self-interests:

> "We are deeply critical of the author of the report, and regard its statement that dumping of mud will lead to an amelioration of the site as a sign of partiality."[32]

In a typical legal doctrinal study, the question of whether and how arguments like these are taken into account by the courts is answered by turning to the courts' own explicit reasoning. We did this, and found that in *none* of the 21 cases included

[27] I.e. arguments in which a private party (not the applicant) complained that the investigator was biased. The keyword *opartisk* was present in 18 cases: M 6300-11 Nacka tingsrätt, M 1044-11 Växjö tingsrätt, M 4315-10 Växjö tingsrätt, M 2190-07 Nacka tingsrätt, M 2090-06 Umeå tingsrätt, M 2474-06 Umeå tingsrätt, M 80-03 Stockholms tingsrätt, M 208-06 Umeå tingsrätt, M 417-06 Vänersborgs tingsrätt, M 141-03 Vänersborgs tingsrätt, M 39-03 Stockholms tingsrätt, M 318-01 Vänersborgs tingsrätt, M 4-00 Vänersborgs tingsrätt, M 6-01 Växjö tingsrätt, M 306-99 Stockholms tingsrätt, M 29-99 Växjö tingsrätt, M 49-99 Växjö tingsrätt, M 515-99 Vänersborgs tingsrätt. Three additional cases were found using the keywords *oberoende mätning*, *oberoende expert* and *oberoende miljögranskare*; M 4034-13 Vänersborgs tingsrätt, M 13-99 Växjö tingsrätt, M 41-01 Vänersborgs tingsrätt.

[28] M 4034-13, Vänersborgs tingsrätt, p. 12. The arguments quoted in this section are originally in Swedish and have been translated into English by us.

[29] M 2090-06, Umeå tingsrätt, p. 56.

[30] M 417-06, Vänersborgs tingsrätt, p. 11.

[31] M 318-01, Vänersborgs tingsrätt, p. 5.

[32] M 2190-07, Nacka tingsrätt p. 135.

in our study, were these arguments explicitly addressed – or even mentioned – in the courts' opinions. However, the fact that the courts have not explicitly addressed the arguments about investigator bias does not necessarily mean that courts are uninfluenced by these arguments when they assess the EIA. Although Swedish courts are supposed to state the reasons that underlie their evidence assessments explicitly,[33] it is a notorious fact that courts' reasoning in this respect is often quite opaque. Moreover, it may be the case that arguments about investigator self-interest affect courts' reliance on experts in a subconscious manner. This suggests that it is difficult to assess how much relevance – if any – courts attach to investigator self-interest by just looking at the courts' explicit reasoning. To complement our reading of the courts' opinions, we therefore conducted a quantitative analysis of the outcomes in the 21 cases.

Quantitative analysis can be used to detect aspects of legal decision-making that cannot be found through a traditional doctrinal analysis. Doctrinal studies of legal decisions have a qualitative character and make in-depth analyses of courts' explicit reasoning.[34] A quantitative analysis, in contrast, can look for correlations among variables in a large number of legal decisions, and can detect patterns and identify factors that have influenced the legal decision-making but that have not been accounted for by the court.[35] Over time, quantitative method has gained a wider acceptance as a tool for legal research and has become recognized as a powerful but underutilized instrument for analysing the legal system and its effects.[36] Several previous studies have used such methods to analyse Swedish court decisions and court decisions on environmental matters.[37] However, we are not aware of any study using quantitative methods to investigate the legal effects of arguments about investigator self-interest in the environmental process.

The aim of the quantitative study was to measure whether there is a correlation between arguments about investigator self-interest and courts' reliance on the impact assessment. Hence, we wanted to compare courts' reliance on impact assessments in cases where these arguments occur, with their reliance on impact assessments in cases where these arguments do not occur. A fundamental problem in a quantitative analysis like this, is how to empirically measure the quantity of interest[38] – in this case the courts' reliance on the impact assessments. Initially, we consid-

[33] SOU 1938:44, Processlagberedningens förslag till rättegångsbalk, p. 378.

[34] Dobinson, I. and Johns, F., "Qualitative Legal Research" in M McConville and W.H. Chui, *Research Methods for Law*, Edinburgh, Edinburgh University Press, 2007. p. 40.

[35] For an accessible introduction to quantitative legal research, see W.H. Chui, "Quantitative Legal Research" in M McConville and W.H. Chui, *Research Methods for Law*, Edinburgh, Edinburgh University Press, 2007.

[36] Dobinson and Johns, note 34; Heise, M., "The Past, Present, and Future of Empirical Legal Scholarship: Judicial Decision Making and the New Empiricism", *University of Illinois Law Review*, 2002.4 (2002): 819–850, p. 849. Posner, R. A., "The State of Legal Scholarship Today: A Comment on Schlag", *Georgetown Law Journal* 97.3 (2008–2009): 845–856, p. 852. Since 2004 there is also a law journal focusing on empirical legal studies, *Journal of Empirical Legal Studies.* Rachlinski, J., "Evidence-Based Law", 96 *Cornell Law Review* 2010-2011, s. 901–924.

[37] See e.g. Czarnezki, J. J., "An Empirical Investigation of Judicial Decisionmaking, Statutuory Interpretation, and the Chevron Doctrine in Environmental Law", *University of Colorado Law Review* 79.3 (2008): 767–824. For some recent quantitative analyses of Swedish court decisons, see Stendahl, S.. "Sakkunniga och värdet av materiellt riktiga domar" in *Festskrift till Lotta Vahlne Westerhäll* Stockholm 2011: 337–356; Pettersson, M., Dahlman, C., Sarwar, F: "Att bedöma personer med kriminell belastning", SvJT 2016/1 (forthcoming); and Wahlberg, L., Dahlman, C., Sarwar, F., Sikström, S and Åkerman, S., "Rättslig prövning av skälen för sluten psykiatrisk tvångsvård: bör domstolarna lita på den medicinska expertisen?" Förvaltningsrättslig tidskrift 4 (2015): 629–646.

[38] Sverke, M., "Quantitative Methods: The Art of Measuring What You Want Measured" in B. Gustavsson (Ed.), *The Principles of Knowledge Creation: Research Meth-*

ered using the strength of the provisions that the courts decide on when they grant a permit (control programs, probations etc.) as a measurable reflection of courts' reliance. We hypothesized that strong provisions would be correlated with low reliance and vice versa.[39] However, we soon realised that it would be extremely difficult – and create serious risks for interpretation errors – to try to identify a group of relevantly similar cases (without arguments about investigator self interest), which could be used as control group. Therefore, we chose to measure rejection rates instead. Because the application shall be rejected if the investigation is poor, rejection rates reflect courts' reliance on the investigation. Admittedly, the reflection is far from perfect. Acceptance rate is a very rough measure: an application can be rejected for reasons other than a poor investigation, and an investigation can be poor for reasons other than investigator self-interests (reasons, however, that a quantitative study can even out). Keeping this in mind, the fact that rejection rate is an unambiguous and easily measurable quantity makes it a suitable object of comparison.

To our knowledge, there is no official statistics available on the environmental courts' rejection rate. Therefore, we also needed to conduct a study of the rejection rate in other cases from the same period that were searchable in the same database and hence could serve as our control group. All such cases from the randomly chosen years 1999, 2003, 2006 and 2013 were included in the control group. The rejection rate in the control group (i.e. cases *without* arguments about investigator self-interest) was approximately 11 %.[40] Among the 21 cases in the test group (i.e. *with* arguments about investigator self-interest) the rejection rate was approximately 17 % (4 rejections). Hence, the rejection rate in the test group is slightly higher than in the control group, but too low to demonstrate a correlation between arguments about investigator self-interest and rejection.

Of course, it should not come as a surprise if courts are unimpressed by arguments about investigator self-interest. Many of these arguments merely restate what is already known and accepted by the legal system: the applicant is responsible for the investigation. Not even the claim that a hired external investigator has an unusually strong secondary interest (such as "NK's" business relation with the applicant in the second quote above) constitutes compelling reasons to question the assessment – the law does not contain any absolute requirement to appoint external expertise to conduct the investigation in the first place. However, some of the arguments about investigator self-interest that we found stated reasons for taking this interest seriously that add to the already known fact that the applicant is responsible for the investigation. More precisely, there are arguments that draw attention to something in the investigator's behavior, which allegedly is an observable effect of the investigator's self interest. We will refer to arguments of this kind as *arguments about behavioral impact*. A typical example is the argument "We are deeply critical of the author of the report, and regard its statement that dumping of mud will lead to an amelioration of the site as a sign of partiality",[41] in the fifth quote above. Arguments about behavioral impact try to show that the conflict of interest is "active", and that the investigation therefore cannot be relied on. These arguments clearly add something to the picture

ods in the Social Sciences, Cheltenham, Edward Elgar, 2007: 46–65.

[39] Let alone that the correlation would not be perfect, since other factors too affect the strength of the provisions.

[40] More precisely, 9 out of 85 (10,58 %) applications were rejected.

[41] M 2190-07, Nacka tingsrätt, p. 135.

since they imply not only that there is a conflict of interest which *risks* influencing the investigation, but also that this conflict *has* influenced the investigation in the particular case. Consequently, these arguments could be expected to have a greater effect on courts' reliance on the investigation than other arguments about investigator self-interest.

A necessary condition for qualifying as an argument about behavioral impact on our definition is thus that the argument draws attention to aspects of the investigator's behavior, that are claimed to result from investigator self-interest. In addition to the argument mentioned above, we found the following two arguments about behavioral impact:

> "The photomontages in the impact assessment show the most favorable conditions from the developer's point of view – the turbines are barely visible. […] The pictures in the photomontage have been taken from a favorable perspective, or with a favorable view at a favorable time. Sometimes, the camera is angled to avoid a "benchmark" in the landscape. The impact assessment is a plea, in which the developer's choice of words and considerations want to present the project as favorably as possible. It is therefore not truthful for us."[42]

> "The investigator's conclusions do not accord with the local and regional limnological competence that we have been in contact with. On the contrary, the investigator appears to present arguments that make a power station appear more beneficial than a demolition. To succeed with this, the value of salmon is belittled, while perch and pike are presented as valuable for angling. We interpret this as loyalty with the investigator's client, i.e. the applicant. It does not give a truthful picture of the conditions. […] To summarize, we inform the investigator, as well as the court, that we cannot accept the contents of the environmental impact assessment and the fishing-investigation, because it includes errors, leaves out important questions, ignore visions for Oreälven's future and does not present impartial facts."[43]

After having identified the cases with arguments about behavioral impact, we complemented the quantitative study with a study of the rejection rate in this particular subgroup. Interestingly, we found that applications were rejected in two of the three cases in which arguments about behavioral impact occurred. This means that the rejection rate in this group was 67 % – hence 6 times higher than in the control group. Of course, correlation does not imply causation. Hence, the correlation between arguments and rejections does not *per se* imply that the arguments have influenced the courts' decisions – alternative explanations are conceivable. Moreover, three cases make a very small sample, and the study needs to be complemented by more comprehensive investigations to establish whether the effect is real. However, it should be noted that – despite the small number of cases – the chance is less than 4 % of getting two rejections in three cases randomly picked from a population with a rejection rate of 11 % (like the control group). More precisely, we can reject the "null hypothesis" (i.e. the hypothesis that the rejection rate in cases where arguments about behavioral impact occur too is 11 %) with a significance of 0.033638.[44]

[42] M 208-06, Umeå tingsrätt, p. 31.

[43] M 80-03, Stockholms tingsrätt, p. 10 f.

[44] See Appendix, where n is the number of cases with arguments about behavioral impact, x is the number of rejections among these cases, and 0.11 is the result of the study of the rejection rate in cases from the same period (see note 40 above). We thank Dragi Anevski at the

The result of the study of cases is summarized in the table below:

	Cases without arguments about investigator self-interest	Cases with arguments about investigator self-interest but without arguments about behavioral impact	Cases with arguments about behavioral impact
No of cases	85	18	3
No of cases in which the courts address the argument	NA	0	0
No of rejections	9	2	2
Rejection rate in %	11 %	11 %	67 %

5. Concluding Remarks

This article has discussed the risk that investigator self-interest decreases the adequacy of environmental impact assessments. We have seen that -in the cases that were included in our study- the courts did not explicitly address arguments about investigator self-interest in their judgments. This is remarkable, since investigator self-interest is known to influence judgment, and because courts and other external assessors who are invited to comment on the impact assessment cannot be expected to detect all serious deficiencies that such interests might lead to. Moreover, the fact that arguments of this kind do occur shows that people worry about the risk that investigator self-interest leads to biased investigations in environmental permit processes. The lack of trust that is manifested in these arguments could therefore by itself be a reason for the courts to address the argument, if only to explain to the public that this kind of conflict is built into – and accepted – by the legal system. Our study did not find any noteworthy difference between the rejection rate in cases with arguments about investigator self-interest and other cases. However, we found en elevated rejection rate in the small group of cases with arguments about so-called behavioral impact (arguments about investigator self-interest that draw attention to aspects of the investigator's behavior, that are claimed to result from investigator self-interest), but the courts did not address these arguments either.

More research is needed on how the risk associated with investigator self-interest is managed in the environmental process. To begin with, more studies are needed to establish whether the effect in cases with arguments about behavioral impact is real, and to clarify what, more precisely, goes on behind the courts' explicit reasoning in cases where arguments about investigator self-interest occur. Recently, some databases have begun to publish all cases decided by the environmental courts. The study presented here could hence be followed up by more comprehensive quantitative studies, which could include decisions that have not been subjected to review by the Supreme Environmental Court.[45] It would also be interesting to know to what extent, and when, arguments about investigator self-interest occur without being included in the court's written judgments. Information of this kind could probably be attained through presence at oral proceedings, or through studies

Centre for Mathematical Sciences, Lund University, for helping us with these calculations.

[45] Although conditions for granting leave to appeal do not suggest that investigator self-interest is treated differently in decisions reviewed by the Supreme Environmental Court than in others, more comprehensive studies are needed to establish whether the results from our study are in fact representative for all decisions by environmental courts.

of other kinds of written material. Furthermore, it is relevant to know what the parties, the courts, the public and the experts themselves think of the risks associated with investigator self-interest. For example: How do courts conceive of the risk that an investigator's self-interest influences the assessment, and what do courts think of their own ability to detect deficiencies that result from such interests? How do experts in cases like these conceive of the risk that secondary interests might influence their own judgment? To what extent is the public concerned about these risks, and is the public's confidence in the environmental process affected by them?

Underlying the discussion in this article lays a more fundamental question jostling for attention: Perhaps it is not such a good idea to entrust the applicant with the investigation? Not only does the fact that the applicant is responsible for the investigation make rules for disqualification inapplicable. In addition, the fact that the applicant is responsible for the investigation implies that the system is obliged to accept the typical risks associated with investigator self-interest.

At the outset of this article, we said that systems like the Swedish therefore seem to assume either that experts' secondary interests do not affect the experts' judgments, or that secondary interests and their effects can be satisfactorily handled within the process. The discussion in this article suggests that both these assumptions are mistaken and that payer-provider relations as well as other secondary interests can decrease the adequacy of the consultant's assessment in ways that cannot be detected during the process. A system with court-appointed experts could potentially decrease the problem with investigator self-interest of either kind. It goes beyond the scope of this article to discuss the feasibility of such a system, but one very general remark can be made here. As mentioned, the requirement that the applicant produces an impact assessment specifies the code's generally formulated demand that a person who pursues an activity must demonstrate that he possesses sufficient knowledge to protect the environment from detrimental impact. Hence, it is the developer's responsibility to see to that an impact assessment is produced, and it is the developer's responsibility to pay for the assessment. These starting-points should not be compromised. However, there is nothing in these premises that implies that the applicant must appoint the consultant: the distribution of responsibility would be maintained if the court appointed and paid the consultant and was compensated for this by the applicant. This alternative system would tend to align the consultant's interests with those of the courts, and allow disqualification of biased experts, when conflicts of interest nevertheless occur. In addition to promoting the adequacy of the impact assessments, a system like this would probably also increase the public's confidence in the process. Clearly, the management of investigator self-interest in the Swedish environmental process deserves more attention in policy-making and scholarly debate than it has hitherto been given.

Appendix to the article "Investigator Self-Interest in the Environmental Process": An exact test for testing the proportion of rejection

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1 Model and test

Let p be the probability of rejection by a courtroom (i.e. the proportion of cases rejected). The model assumptions are that each case is rejected or not with the same probability p, independent of the outcome in other cases. Let n be the number of cases that are presented in the courtroom. Let X be the number of cases among those n that are in fact rejected. Then X is a random variable which is Binomially distributed with parameter n and p. That means that the probability that exactly k of the cases are rejected can be calculated with the formula

$$P(X = k) = \binom{n}{k} p^k (1-p)^{n-k},$$

for $k = 0, 1, \ldots, n$.

Now assume that $n = 3$ and we have observed $x = 2$. The courtroom claims that there is nothing particular about the outcome $x = 2$ and that this is consistent with the normal rejection rate of no more than $p = 0.11$. We want to test the hypothesis

H_0 : $p \leq 0.11$ The rejection rate is the normal
H_1 : $p > 0.11$ The rejection rate is higher than the normal

We make a test by calculating the error probability of rejecting the null hypothesis H_0 if the null hypothesis is true, on the basis of the outcome. That means that we calculate the probability of claiming that "the rate is higher than normal" when in fact "the rate is only normal".

This is done as follows: If H_0 is true $p = 0.11$. Then the probability of $X \geq 2$ is

$$\begin{aligned} P(X = 2) + P(X = 3) &= \binom{3}{2} 0.11^2 (1 - 0.11)^{3-2} + \binom{3}{3} 0.11^k (1 - 0.11)^{3-3} \\ &= 0.033638. \end{aligned}$$

This is a small error probability. Therefore we can reject the null hypothesis of "a normal rejection rate" with a significance of 0.033638.