ISSN 1936-5349 (print)
ISSN 1936-5357 (online)

HARVARD

JOHN M. OLIN CENTER FOR LAW, ECONOMICS, AND BUSINESS
FELLOWS' DISCUSSION PAPER SERIES

STRATEGIC STATUTORY INTERPRETATION BY ADMINISTRATIVE AGENCIES

Yehonatan Givati

Discussion Paper No. 16

7/2008

Harvard Law School
Cambridge, MA 02138

Strategic Statutory Interpretation by Administrative Agencies

Yehonatan Givati*

Abstract

How do administrative agencies interpret the law when it is ambiguous? This paper shows that administrative agencies choose between two strategies of statutory interpretation: the risky strategy – a relatively aggressive interpretation that provokes an appeal by the firm – and the safe strategy – a relatively non-aggressive interpretation that the firm complies with. The agency's strategy depends on the level of judicial deference, and on litigation costs. It turns out that an increase in the level of judicial deference or in the firm's litigation cost will not necessarily result in the agency choosing a more aggressive statutory interpretation. Since an increase in the level of judicial deference may result in a shift from the risky strategy to safe one or vice versa, the number of cases in which the court upheld the agency's interpretation cannot be used to measure the effect of such a change.

1 Introduction

Many laws are administered by administrative agencies. How do administrative agencies interpret the law when it is ambiguous? This question will

*John M. Olin Fellow in Law and Economics at Harvard Law School. I am grateful to Louis Kaplow, Steven Shavell, Matthew Stephenson, participants in the Eighteenth Annual Meeting of the American Law and Economics Association, the Political Economy and Public Law Conference at Harvard Univeristy, and the JD/PhD writing workshop at Harvard Law School for helpful comments on prior drafts, and to the John M. Olin Center for Law, Economics, and Business at Harvard Law School for research support. Please send comments to ygivati@law.harvard.edu.

be considered in the present paper, employing a model with two strategic players – an administrative agency and a firm – and a non-strategic one – the court.

The model assumes that the administrative agency maximizes some objective function when choosing how to interpret the law. Once the agency chooses its statutory interpretation the firm either complies with the agency's interpretation or appeals it in court. If the interpretation is appealed the court has to decide whether to uphold the agency's interpretation, or to reverse it and adopt the interpretation that the court thinks is most reasonable. Thus, when choosing its statutory interpretation the agency takes into consideration the firm's and its own litigation cost, as well as the probability that its interpretation will be reversed by the court. This probability is affected by the doctrine of judicial deference, according to which courts must defer to the agency's interpretation of its own statute as long as that interpretation is reasonable.[1]

According to the model, administrative agencies choose between two strategies of statutory interpretation: the risky strategy and the safe one. In the risky strategy the agency chooses a relatively aggressive interpretation that provokes an appeal by the firm, and consequently the agency bears the cost of litigation and the risk of having its interpretation reversed by the court. Nonetheless, the agency refrains from choosing an interpretation that is too aggressive in order to avoid a high likelihood of reversal by the court. In the safe strategy the agency chooses a relatively non-aggressive interpretation that will be complied with and will not provoke an appeal by the firm. Still, the agency refrains from choosing an interpretation that is not sufficiently aggressive, since as long as no appeal is provoked a more aggressive interpretation is preferred to a less aggressive one.

The agency's choice of strategy depends on the level of judicial deference, and on the firm's and its own litigation cost. The model realistically predicts that depending on these variables in some cases the agency chooses the safe strategy and its interpretation will not be appealed, and in other cases it chooses the risky strategy and its interpretation will be appealed. If the interpretation is appealed then in some cases it will be upheld by the court, while in other cases it will be reversed.

The model is used to analyze how changes in the level of judicial defer-

[1] The doctrine of judicial deference to a government agency's statutory interpretation was clearly set forth in the Supreme Court's decision Chevron (1984).

ence affect the aggressiveness of the agency's statutory interpretation. This analysis shows that a change in the legal doctrine so that courts become more deferential not only makes the risky strategy, but also the safe one, more appealing, as the firm's threshold for appealing the agency's interpretation increases. Thus, if the agency originally chose the safe strategy, it will adopt a more aggressive interpretation, regardless of whether it will move to the risky strategy or hold on the safe one. However, if the agency originally chose the risky strategy, it will not necessarily adopt a more aggressive interpretation of the law, and in some cases the agency may even adopt a less aggressive interpretation. This occurs when following the increase in judicial deference the agency moves from the risky strategy to the safe one. Moreover, the agency may adopt a less aggressive statutory interpretation even if it holds on to the risky strategy. This occurs when despite the decrease in the probability of reversal by the court due to the increase in judicial deference, there is an increase in the marginal probability of reversal by the court. This analysis has significant implications for the debate on the appropriate level of judicial deference to administrative agencies' statutory interpretation (Scalia 1989, Breyer 1986).

Furthermore, the analysis shows that an increase in the level of judicial deference may result in the agency moving from the risky strategy to safe one or vice versa. Since a move to the safe strategy eliminates litigation, and a move to the risky strategy produces litigation, the number of cases in which the court upheld the agency's interpretation cannot be used to measure the effect of an increase in the level of judicial deference.

The model is also used to analyze how changes in the agency's and the firm's litigation cost affect the aggressiveness of the agency's statutory interpretation. This analysis has important ramification, since it introduces new tools for affecting agencies' statutory interpretation, and explains what type of changes in litigation costs should be made if one would like to reduce agencies' aggressiveness. More concretely, the analysis shows that an increase in the firm's litigation cost makes the safe strategy more appealing, since the firm's threshold for appealing the agency's interpretation increases. Accordingly, if the agency originally chose the safe strategy, it will hold on to this strategy, adopting a more aggressive interpretation of the law. However, if the agency originally chose the risky strategy, under certain conditions it will move to the safe strategy, adopting a less aggressive statutory interpretation. Likewise, the model explains that an increase in the agency's litigation cost makes the risky strategy less appealing. Accordingly, if the agency originally chose the safe strategy, it will hold on to this strategy and there will be no change in its interpretation of the law. However, if the agency originally chose the risky strategy, under certain conditions it will move to the safe strategy, adopting a less aggressive statutory interpretation.

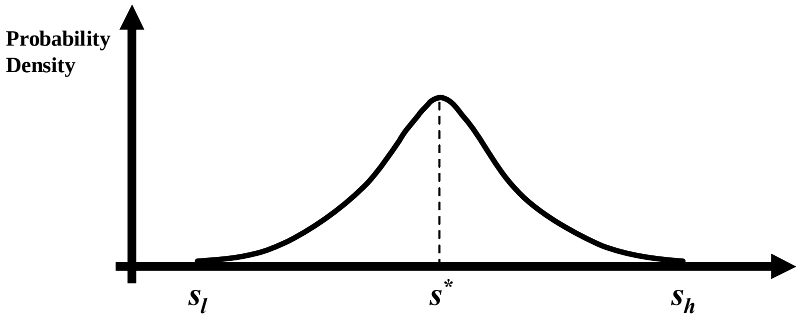
Several papers have used formal models to address administrative agencies' statutory interpretation, either directly (Stephenson 2006) or indirectly, when analyzing the interaction between Congress, the president, an administrative agency and the court (Cohen and Spitzer 1994, Eskridge and Ferejohn 1992, Ferejohn and Weingast 1992). This paper is different in several respects. Unlike other papers, this paper incorporates the firm's decision to appeal the agency's interpretation into the model, and does not assume that the agency's interpretation will always be challenged in court. This point is presented in a more general setting in Shavell (2006). Furthermore, some of those papers do not incorporate the judicial deference doctrine into their model, while others which do so, do it in a relatively simplistic manner. The judicial deference doctrine is modeled in those papers as some exact threshold that when crossed triggers the court's intervention. Since this threshold is assumed to be known to the agency, the agency can accurately predict the court's decision, which means that the agency's statutory interpretation is never appealed or reversed by the court, and that the higher the level of deference the more aggressive the agency's statutory interpretation will be. By contrast, the model that is analyzed in this paper realistically assumes that the agency is uncertain of the court's decision, and the judicial deference doctrine is reflected in the probability of reversal by the court, where the less reasonable the agency's interpretation is the more likely the court is to reverse it. Thus, according to the model, when the agency's interpretation is appealed in some cases it will be upheld and in other cases it will be reversed.

The paper proceeds as follows. Section 2 presents the model which, for concreteness, and without restriction of generality, focuses on an environmental protection agency. Section 3 analyzes the model and section 4 analyzes comparative statics. Section 5 concludes.

2 The Model

Consider a model with two risk-neutral strategic players – an environmental protection agency and a firm – and a non-strategic one – the court. The law concerning the environmental standard that the firm has to comply with is

Figure 1: Reasonableness of Possible Interpretations



ambiguous. Different statutory interpretations are possible, and every possible interpretation corresponds to a certain standard. The possible standards are between a low standard, s_l, and a high standard, s_h, and the court's view of their reasonableness is described using the probability density function $f(s)$. The higher $f(s)$ the more reasonable s is.

Given the different possible interpretations of the law and the court's view of their reasonableness, the most reasonable standard that the firm should comply with is s^*, where:

$$s^* = \arg\max_s f(s)$$

I assume that $f'(s) > 0$ for $s \in [s_l, s^*)$, and that $f'(s) < 0$ for $s \in (s^*, s_h]$. This means that as we move away from s^* the reasonableness of the standard decreases.[2] Figure 1 depicts a possible density function of the standards.

The model has three stages. In the first stage the agency chooses s, the standard that it thinks the firm should comply with. In the second stage the firm decides whether to comply with this standard or to appeal the agency's

[2]The analysis will not change if there are several standards that are equally most reasonable instead of a single one. Specifically, if $[\dot{s}, \ddot{s}] = \arg\max f(s)$, which means that $[\dot{s}, \ddot{s}] \subset (s^l, s^h)$ includes possible standards that are all equally most reasonable (and assume now that $f'(s) > 0$ for $s \in [s^l, \dot{s})$ and that $f'(s) < 0$ for $s \in (\ddot{s}, s^h]$), then if we define $s^* = (\dot{s} + \ddot{s})/2$ there will be no change in the analysis of the model. In such a case the administrative agency will choose $s \in [\ddot{s}, s^h]$ and the model explains how the agency stretches the statutory interpretation beyond the most reasonable interpretation that is also most reasonable ($\ddot{s}$). In a similar setting s^* can be thought of as the agency's expected interpretation upon remand.

decision in court. An appeal is costly for the firm and the agency. If the firm decides to appeal the agency's decision then in the third stage the court has to decide what standard should be complied with.

The agency's objective function, U, takes into account the standard, s, and its litigation cost, c^a, if the case is litigated. The agency prefers a higher standard to a lower one (an environmentalist agency),[3] and assume for simplicity that U is linear in s. Thus, the agency maximizes:

$$U = \alpha s - c^a \tag{1}$$

where $\alpha > 0$.

The firm's objective is to minimize its cost function C, which takes into account the cost of complying with the standard s, and its litigation cost, c^f, if the case is litigated. The higher the standard is, the more costly it is to comply with, and assume for simplicity that C is linear in s. Thus, the firm minimizes:

$$C = \beta s + c^f \tag{2}$$

where $\beta > 0$.

If the firm appeals the agency's decision the court has to decide what standard should be complied with. Both the firm and the agency are uncertain of the court's decision. There is a probability $g(f(s)) \in [0, 1]$ that the court will reverse the agency's interpretation of the statute and instead adopt the most reasonable statutory interpretation s^*, and there is a probability $1 - g(f(s))$ that the court will uphold the agency's interpretation. I assume that $g(f(s^*)) = 0$ and $g(0) = 1$, and that $g'(f(s)) < 0$. This is a formal expression of the judicial deference doctrine, since it means that the less reasonable s is, the more likely the court is to reverse it.

For ease of exposition, let us define $h(s) = g(f(s))$, the probability of the court reversing the agency's interpretation s. Accordingly, $h(s^*) = 0$, and $h(s_h) = h(s_l) = 1$. Note that $h'(s) > 0$ for $s \in (s^*, s_h]$, and that $h'(s) < 0$ for $s \in [s_l, s^*)$. This means that as we move away from s^* the probability of the court reversing the agency's interpretation increases.

At this point it is important to emphasize the difference between the way judicial deference is modeled in this paper and the way it is modeled in other

[3] One can also think of a tax agency that wants to maximize tax revenue, or in which there is a widespread perception among employees that promotion depends on enforcement results. See: US General Accounting Office (1998).

papers. In other models judicial deference is defined by some threshold $\hat{s}$ that is decided by the court. The agency knows that if it chooses $\hat{s}$ (or any $s \leq \hat{s}$) its interpretation will be upheld by the court, but if $\hat{s} + \varepsilon$ is chosen it will be reversed. By contrast, this paper uses a framework that seems more realistic. The model assumes that the agency knows that there is some indisputable interpretation, represented by s^*, that will not be reversed by the court. The agency also knows that some flagrant interpretation is guaranteed to be reversed by the court, and this interpretation is represented by s_h (or s_l). In between s^* and s_h (or s_l) there are many possible interpretations that the agency may choose. The closer the interpretation is to the indisputable interpretation the lower the probability of the court reversing it

3 Analysis

Since the agency prefers a higher standard to a lower one (see expression 1), it will choose $s \in [s^*, s_h]$ in the first stage ($s < s^*$ will never be chosen). Let us adjust s^*, s_h and s_l so that s^* is normalized to equal 0.

In the second stage, the firm appeals the agency's decision s if its cost function, given the court's expected ruling (based on the probability of the court reversing the agency's interpretation, $h(s)$) and its litigation cost (c^f), is lower than the cost of complying with s. Thus, based on expression 2, the firm will appeal the decision if the following condition holds:

$$\beta s > \beta s(1 - h(s)) + c^f \tag{3}$$

where the left side of expression 3 is the firm's cost of complying with s, and the right side is of expression 3 is the firm's expected cost of appealing s.

Let us define the threshold s, above which the firm will appeal the agency's decision. Rearranging on expression 3, the threshold s is the s for which the following expression holds:

$$c^f = \beta h(s)s \tag{4}$$

As will be shown immediately, this s is a corner solution, and accordingly it will be denoted s^{cs}.

Now we can define $U(s)$, the agency's expected utility for every choice of s it makes:

$$U(s) = \begin{cases} \alpha s & \text{if } s \leq s^{cs} \\ \alpha s(1 - h(s)) - c^a & \text{else} \end{cases} \tag{5}$$

Let us explain expression 5. If the agency chooses $s \leq s^{cs}$ as its interpretation of the law, the firm will not appeal the decision and will comply with the standard s. If the agency chooses $s > s^{cs}$ as its interpretation of the law, the firm will appeal the ruling. In that case the agency will have to pay its litigation cost (c^a), and its expected utility depends on the probability of the court upholding its interpretation $(1 - h(s))$.

The agency chooses s to maximize expression 5. There is a different s that maximizes each range. For $s \leq s^{cs}$, s^{cs} maximizes $U(s)$. This is the corner solution. For $s > s^{cs}$ the s that maximizes $U(s)$ is defined by the first order condition:

$$h'(s)s = 1 - h(s) \tag{6}$$

The s for which expression 6 holds is the interior solution, and will be denoted s^{is}.[4]

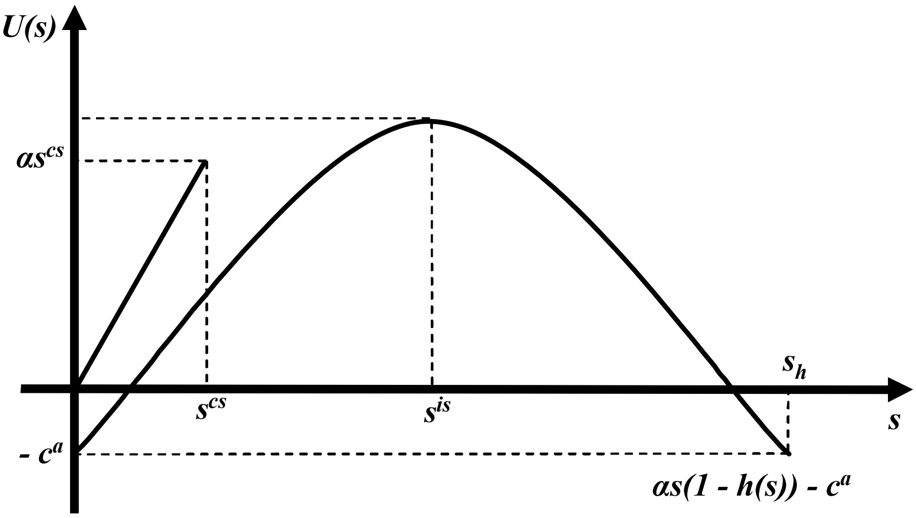
Let us elaborate on the first order condition. The right side of expression 6 is the increase in the agency's utility from increasing s by one, since it is the probability that the court will uphold the agency's interpretation. The left side of expression 6 is the decrease in the agency's utility from increasing s by one, since it is the marginal change in the probability that the court will reverse the agency's interpretation, multiplied by the agency's loss of utility in that case. Thus, the first order condition means that the marginal increase in the agency's utility from increasing s by one is equal to marginal decrease in its utility from this change.

Proposition 1 *The agency chooses its statutory interpretation by comparing its expected utility from the interior solution and the corner solution. If $U(s^{is}) > U(s^{cs})$ it will choose the interior solution s^{is} as its interpretation of the law. If $U(s^{is}) \leq U(s^{cs})$ it will choose the corner solution s^{cs} as its interpretation of the law.*

Choosing the interior solution s^{is} is the *risky strategy*, since the firm will appeal the agency's decision, and consequently the agency has to bear the cost of litigation as well as the risk of having its interpretation reversed by

[4] The second order condition for this s to maximize $U(s)$ is: $h''(s) > -2h'(s)/s$. Since $h'(s)$ and s are positive the second order condition will not be met only if $h''(s)$ is negative, and smaller than -$2h'(s)/s$. In such a case this s will minimize $U(s)$, and the agency will always choose the corner solution or a different s that maximize $U(s)$. Therefore such a case is of little interest.

Figure 2: Agency's Expected Utility



the court. Choosing the corner solution s^{cs} is the *safe strategy*, since the firm will comply with the agency's interpretation and will not appeal it

$U(s)$ is depicted in figure 2 for the case where $U(s^{is}) > U(s^{cs})$. As one can see, reflecting expression 5, $U(s)$ is the linear function αs for $s \leq s^{cs}$, but for $s > s^{cs}$ it is the curve $\alpha s(1 - h(s)) - c^a$. The corner solution s^{cs} and the interior solution s^{is} are indicated in figure 2.

Depending on the parameters of the model the agency will chose the safe strategy in some cases, and the risky strategy in other cases.[5] If the safe strategy is chosen the agency's interpretation is not appealed. If the risky strategy is chosen the agency's interpretation is appealed. It will be reversed by the court with probability $h(s^{is})$, and upheld with probability $1 - h(s^{is})$. Thus, the model explains three types of cases: cases where the agency's interpretation of the law is not appealed; cases where the agency's interpretation of the law is appealed and reversed by the court; and cases where the agency's interpretation of the law is appealed and upheld by the court.

[5]Note that unless both $c^a = 0$ and $c^f = 0$ there will always a trade-off between the safe strategy and the risky one.

4 Comparative Statics

In this section the effect of changes in certain variables on the agency's statutory interpretation will be analyzed. If following a change in a variable the agency chooses an interpretation s that is further from the most reasonable interpretation s^* than its original interpretation, it will be considered more aggressive.

Before turning to the comparative statics, let us note in corollary 1 an immediate result from the model that will be later used.

Corollary 1 *If $U(s^{is}) > U(s^{cs})$, which means that the risky strategy is chosen, then $s^{is} > s^{cs}$.*

Proof. $U(s^{is}) > U(s^{cs})$ means that $\alpha s^{is}(1 - h(s^{is})) - c^a > \alpha s^{cs}$. Since $\alpha s^{is} > \alpha s^{is}(1 - h(s^{is})) - c^a$ it must be that $s^{is} > s^{cs}$. ■

Intuitively, If the agency prefers the risky strategy to the safe one, it is willing to bear the cost of litigation and the risk of having its interpretation reversed by the court. What compensates for the cost and the risk involved in the risky strategy is the possibility of implementing a higher standard. Thus, in this case the chosen standard must be higher then the safe strategy's standard ($s^{is} > s^{cs}$).

4.1 Level of Deference

The level of judicial deference to agency' statutory interpretation reflects a balance between two competing objectives: allowing agencies to use their expertise, and requiring agencies to adopt a reasonable reading of the statute so that they will not pursue their own independent objectives. A change in the balance between these two objectives changes the level of judicial deference.

An increase in the level of deference to the agency' statutory interpretation means that for every interpretation of the law the agency chooses there is a lower probability of reversal by the court. Formally, $h(s)$ was defined in section 2 as a function that expresses the probability of the court reversing the agency's statutory interpretation s and instead ruling that $s^* = 0$ should be complied with. $h_1(s)$ will be considered a new function that expresses a higher level of deference if $h(s) > h_1(s)$ for $s \in (s^*, s_h)$.

The increase in the level of deference affects the model. Following the change in the court's decision function from $h(s)$ to $h_1(s)$ the new threshold

s above which the firm appeals the agency's decision will be denoted s_1^{cs}, and is be defined by the following condition:

$$c^f = \beta h_1(s)s \tag{4a}$$

This s is also the new corner solution. Comparing expressions 4 and 4a we can see that $s_1^{cs} > s^{cs}$ (since $h_1(s^{cs}) < h(s^{cs})$ and $h_1'(s) > 0$). This result can be understood intuitively. The increase in the level of deference means that for every s that the agency chooses there is a lower probability of reversal by the court. Thus, the firm will be more reluctant to appeal the agency's decision, and will appeal the decision only above a higher threshold.

The agency's new expected utility function will be denoted $U_1(s)$, and is defined by the following:

$$U_1(s) = \begin{cases} \alpha s & \text{if } s \leq s_1^{cs} \\ \alpha s(1 - h_1(s)) - c^a & \text{else} \end{cases} \tag{5a}$$

The new interior solution, s_1^{is}, is defined by the following first order condition:

$$h_1'(s)s = 1 - h_1(s) \tag{6a}$$

Following the increase in the level of deference, if $U_1(s_1^{is}) > U_1(s_1^{cs})$ the agency will choose the risky strategy and s_1^{is} as its interpretation of the law. Otherwise, the safe strategy will be chosen, and s_1^{cs} will be its interpretation of the law.

Proposition 2 *When the level of deference increases, and the court's decision function changes from $h(s)$ to $h_1(s)$, then*

1. *If the agency originally chose the safe strategy its new interpretation will be more aggressive than its original interpretation.*

2. *If the agency originally chose the risky strategy then, depending on the shape of $h_1(s)$, the agency's new interpretation will either be more aggressive or less aggressive than its original interpretation.*

Let us first focus on case 1 of proposition 2. If the agency originally chose the safe strategy, its original interpretation was the corner solution s^{cs}. Following the change the agency holds on to the safe strategy in some cases, and in other cases it moves to the risky strategy. This can be shown using an example.

Example 1 *Suppose* $h(s) = \frac{s}{s_h}$ *and* $h_1(s) = xh(s)$*, where* $x \in (0,1)$*.* $h_1(s)$ *expresses a higher level of judicial deference since* $h(s) > h_1(s)$ *for* $s \in (0, s_h)$*. Based on expression 4 we get* $s^{cs} = (\frac{c^f s_h}{\beta})^{\frac{1}{2}}$ *and* $s_1^{cs} = (\frac{c^f s_h}{\beta x})^{\frac{1}{2}}$*, and using expression 6 we get* $s^{is} = \frac{s_h}{2}$ *and* $s_1^{is} = \frac{s_h}{2x}$*.*

Since the agency originally chose the safe strategy we know that $U(s^{cs}) \geq U(s^{is})$*. If we assume for simplicity that* $c^a = 0$ *this occurs when* $c^f \geq \frac{\beta S_h}{16}$*.*

Following the increase in the level of judicial deference, the agency holds on to the safe strategy if $U_1(s_1^{cs}) \geq U_1(s_1^{is})$*, which occurs when* $c^f \geq \frac{\beta S_h}{16x}$*. Thus, if the agency originally chose the safe strategy then, following the increase in the level of judicial deference, it will hold on to the safe strategy, choosing the new corner solution* s_1^{cs} *when* $c^f \geq \frac{\beta S_h}{16x}$*. It will move to the risky strategy, choosing the new interior solution* s_1^{is} *when* $c^f \in [\frac{\beta S_h}{16}, \frac{\beta S_h}{16x})$*.*

After showing that both cases are possible, let us anlayze them. If following the change the agency holds on to the safe strategy and chooses the new corner solution s_1^{cs}, then since $s_1^{cs} > s^{cs}$, the new interpretation is more aggressive than the original interpretation. If following the change the agency moves to the risky strategy and chooses the new interior solution s_1^{is}, then we know that $s_1^{is} > s_1^{cs}$ (corollary 1). But since $s_1^{cs} > s^{cs}$ it must also be that $s_1^{is} > s^{cs}$, which means that the new interpretation is more aggressive than the original interpretation. Thus, in both cases the agency's new interpretation is more aggressive than its original interpretation.

Let us now focus on case 2 of proposition 2, showing that unlike the common view in the literature (Stephenson 2006, Cohen and Spitzer 1994, Eskridge and Ferejohn 1992, Ferejohn and Weingast 1992, Elliott 2005), an increase in the level of deference will not necessarily result in the agency being more aggressive in its interpretation of the law. If the agency originally chose the risky strategy, its original interpretation was the interior solution s^{is}. Following the change the agency holds on to the risky strategy in some cases, and in other cases it moves to the safe strategy. This can be shown using an example.

Example 2 *Suppose* $h(s) = \frac{s}{s_h}$ *and* $h_1(s) = h(s)^2$*.* $h_1(s)$ *expresses a higher level of judicial deference since* $h(s) > h_1(s)$ *for* $s \in (0, s_h)$*. Based on expression 4 we get* $s^{cs} = (\frac{c^f s_h}{\beta})^{\frac{1}{2}}$ *and* $s_1^{cs} = (\frac{c^f s_h^2}{\beta})^{\frac{1}{3}}$*, and using expression 6 we get* $s^{is} = \frac{s_h}{2}$ *and* $s_1^{is} = \frac{s_h}{\sqrt{3}}$*.*

Since the agency originally chose the risky strategy we know that $U(s^{is}) > U(s^{cs})$*. If we assume for simplicity that* $c^a = 0$ *this occurs when* $c^f < \frac{\beta S_h}{16}$*.*

Following the increase in the level of judicial deference, the agency holds on to the risky strategy if $U_1(s_1^{is}) > U_1(s_1^{cs})$*, which occurs when* $c^f < \frac{8\beta S_h}{81\sqrt{3}}$*. Thus, if the agency originally chose the risky strategy then, following the increase in the level of judicial deference, it will hold on to the risky strategy, choosing the new interior solution* s_1^{is} *when* $c^f < \frac{8\beta S_h}{81\sqrt{3}}$*. It will move to safe strategy, choosing the new corner solution* s_1^{cs} *when* $c^f \in [\frac{8\beta S_h}{81\sqrt{3}}, \frac{\beta S_h}{16})$*.*

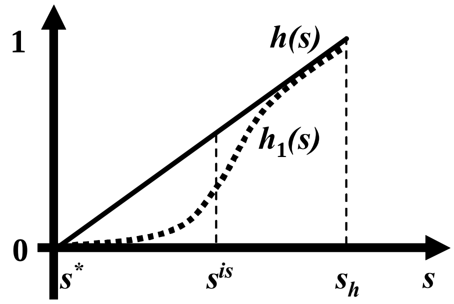
After showing that both cases are possible, let us first analyze the case where following the change the agency moves to the safe strategy and the new corner solution s_1^{cs}. Is s_1^{cs} greater or smaller than the agency's original interpretation s^{is}? Since the agency originally chose the risky strategy, we know that $s^{is} > s^{cs}$ (corollary 1). As noted before, we also know that $s_1^{cs} > s^{cs}$. This is because for s^{cs} the right side expression 4a is smaller than its left side (since $h_1(s^{cs}) < h(s^{cs})$) and thus s must be increased in order to restore the equality. Note that $\frac{d\beta h_1(s)s}{ds} = \beta(h_1'(s)s + h_1(s))$. Thus, the smaller $h_1'(s)$ and $h_1(s)$ are, the higher s_1^{cs} will have to be in order to restore the equality. Accordingly, if $h_1'(s)$ and $h_1(s)$ are sufficiently small the agency's new interpretation will be more aggressive than its original interpretation. However, if $h_1'(s)$ and $h_1(s)$ are not sufficiently small the agency's new interpretation will be less aggressive than its original interpretation.

Let us further explain the latter result. The increase in judicial deference, which reduces the probability of reversal by the court, makes the safe strategy more appealing, since the firm's threshold for appealing the agency's interpretation increases ($s_1^{cs} > s^{cs}$). Therefore the agency moves from the risky strategy to the safe one, adopting a less aggressive interpretation that will not be challenged in court.

Now let us turn to the case where following the change the agency holds on to the risky strategy and chooses the new interior solution s_1^{is}.[6] Is s_1^{is} greater or smaller than the agency's original interpretation s^{is}? This is determined by comparing expressions 6 and 6a. Define $\bar{h}_1'(s^{is})$ for which $\bar{h}_1'(s^{is})s^{is} = 1 - h_1(s^{is})$. This means that for $\bar{h}_1'(s^{is})$ the first order condition in expression 6a holds for s^{is}, the original interior solution. Now, if $h_1'(s^{is}) < \bar{h}_1'(s^{is})$ then for s^{is} the right side expression 6a is greater than its left side. Therefore s must be increased in order to restore the equality (an increase in s decreases the right side of expression 6a, since $h_1'(s) > 0$, and increases the left side

[6] This is particularly relevant to high profile cases, where the agency expects its interpretation to always be appealed, and therefore the risky strategy will always be chosen.

Figure 3: Increase in Judicial Deference



of that expression). Accordingly $s_1^{is} > s^{is}$, which means that the increase in the level of deference results in the agency choosing a more aggressive interpretation of the law.

However, if $h_1'(s^{is}) > \bar{h}_1'(s^{is})$ then despite the fact that $h_1(s^{is}) < h(s^{is})$, for s^{is} the left side expression 6a is greater than its right side, and in order to restore the equality s must be decreased. Accordingly $s_1^{is} < s^{is}$, which means that despite the increase in the level of deference the agency will choose a less aggressive interpretation of the law. This occurs in the realistic case where following the increase in deference the court gives the agency more leeway around s^*, but is not significantly more tolerant for more distant s's, as depicted in figure 3.

Let us further explain the latter result, focusing on the first order condition in expression 6. As noted in section 3 this condition means that the increase in the agency's utility from increasing s by one is equal to the decrease in its utility from this change. The increase in the agency's utility from increasing s depends on the probability that the court will uphold the agency's chosen interpretation (the right side of expression 6). An increase in the level of deference increases the probability that the court will uphold the agency's interpretation, and thus the agency's expected utility from choosing a more aggressive interpretation increases. However, the decrease in the agency's utility from increasing s depends on the *marginal* increase in the probability of the court reversing the agency's interpretation (the left side of expression 6). Even if the level of deference increases, it is still possible that, in the vicinity of s^{is}, the marginal increase in the probability of the court reversing the agency's interpretation is higher than before, and consequently the agency's utility from choosing a more aggressive interpretation decreases. If the latter effect is sufficiently strong, the agency will choose a less aggressive interpretation in spite of the increase in the level of deference.

According to the above analysis, an increase in the level of judicial deference may result in a shift from the risky strategy to safe one, but may also result in a shift from the safe strategy to risky one. When the agency moves from the risky strategy to the safe one litigation disappears, while a change in other direction produces litigation. This means that the consequences of an increase in the level of judicial deference cannot be measured by observing the number of cases in which the court upheld the agency's interpretation, a method that was employed in several papers (Schuck and Elliott 1990, Merill 1992, Cohen and Spitzer 1994, Avila 2000).

4.2 Firm's Litigation Cost

Suppose the firm's litigation cost increases to c_2^f, where $c_2^f > c^f$. This increase affects the threshold s above which the firm appeals the agency's decision. The new threshold s will be denoted s_2^{cs}, and this will also be the new corner solution. Based on expression 4 we can tell that $s_2^{cs} > s^{cs}$ (since $h'(s) > 0$). This can be understood intuitively – when the firm's litigation cost is greater it will appeal the agency's statutory interpretation in fewer cases.

The agency's new expected utility function will be denoted $U_2(s)$, and is defined by the following:

$$U_2(s) = \begin{cases} \alpha s & \text{if } s \leq s_2^{cs} \\ \alpha s(1 - h(s)) - c^a & \text{else} \end{cases} \tag{5b}$$

There is no change in the interior solution s^{is}, since there is no change in the first order condition in expression 6.

Following the increase in the firm's litigation cost, the agency will choose the risky strategy and s^{is} as its interpretation of the law if $U_2(s^{is}) > U_2(s_2^{cs})$. Otherwise, the safe strategy will be chosen, and s_2^{cs} will be its interpretation.

Define $\bar{c}_2^f$ and based on expression 4 a corresponding $\bar{s}_2^{cs}$, for which $\bar{s}_2^{cs} = s^{is}$. This means that if the firm's litigation cost is $\bar{c}_2^f$, the corner solution interpretation is identical to interior solution interpretation.

Proposition 3 *When the firm's litigation cost increases to c_2^f then*

1. *If the agency originally chose the safe strategy its new interpretation will be more aggressive than its original interpretation.*

2. *If the agency originally chose the risky strategy then, if* $c_2^f > \bar{c}_2^f$ *its new interpretation will be more aggressive than its original interpretation, but if* $c_2^f < \bar{c}_2^f$ *its new interpretation will be less aggressive than its original interpretation.*

Let us first focus on case 1 of proposition 3. If the agency originally chose the safe strategy, its original interpretation was the corner solution s^{cs}. Accordingly, we know that $U(s^{cs}) \geq U(s^{is})$. Since $U_2(s^{is}) = U(s^{is})$ and $s_2^{cs} > s^{cs}$, it must be that $U_2(s_2^{cs}) > U_2(s^{is})$. Thus, if the agency's originally chose the safe strategy it will hold on to this strategy, choosing the new corner solution interpretation s_2^{cs}. Since $s_2^{cs} > s^{cs}$, this means that the increase in the firm's litigation cost results in the agency's choosing a more aggressive interpretation.

Now, let us turn to case 2 of proposition 3. If the agency originally chose the risky strategy, its original interpretation was the interior solution s^{is}. Define $\hat{c}_2^f > c^f$, and based on expression 4 a corresponding $\hat{s}_2^{cs} > s^{cs}$, for which $U_2(\hat{s}_2^{cs}) = U_2(s^{is})$. This means that if the firm's litigation cost is $\hat{c}_2^f$, the agency's utility from choosing the safe strategy and the corner solution interpretation is equal to its utility from choosing the risky strategy and the interior solution interpretation. Now, if $c_2^f < \hat{c}_2^f$ then $U_2(s_2^{cs}) < U_2(s^{is})$, which means that following the change the agency holds on to the risky strategy and remains on the interior solution which did not change. But if $c_2^f \geq \hat{c}_2^f$ then $U_2(s_2^{cs}) \geq U_2(s^{is})$, which means that following the change the agency's moves to the safe strategy, choosing the new corner solution interpretation s_2^{cs}. In this case, if $c_2^f > \bar{c}_2^f$ then $s_2^{cs} > s^{is}$, which means that the agency's new interpretation is more aggressive than its previous one. However, if $c_2^f < \bar{c}_2^f$ then $s_2^{cs} < s^{is}$, which means that the agency's new interpretation is less aggressive than its original interpretation.

Let us further explain the latter result. The increase in the firm's litigation cost increases its threshold for appealing the agency's interpretation. This makes the safe strategy more appealing. Consequently, the agency moves from the risky strategy to the safe one, adopting a statutory interpretation that is less aggressive but will not be challenged.

4.3 Agency's Litigation Cost

Suppose the agency's litigation cost increases to c_3^a, where $c_3^a > c^a$. The increase in the agency's litigation cost does not affect the corner solution s^{cs}, which is also the threshold s above which the firm will appeal the agency's decision, since there is no change in expression 4. The agency's new expected utility function will be denoted $U_3(s)$, and is defined by the following:

$$U_3(s) = \begin{cases} \alpha s & \text{if } s \leq s^{cs} \\ \alpha s(1 - h(s)) - c_3^a & \text{else} \end{cases} \tag{5c}$$

There is no change in the interior solution s^{is}, since there is no change in the first order condition in expression 6.

Following the increase in the agency's litigation cost, the agency will choose the risky strategy and s^{is} as its interpretation of the law if $U_3(s^{is}) > U_3(s_3^{cs})$. Otherwise, the safe strategy will be chosen, and s_3^{cs} will be the agency's interpretation.

Define $\bar{c}_3^a$ for which $U_3(s^{is}) = U_3(s^{cs})$. This means that if the agency's litigation cost is $\bar{c}_3^a$, the agency's utility from choosing the safe strategy and the corner solution interpretation is equal to its utility from choosing the risky strategy and the interior solution interpretation.

Proposition 4 *When the agency's litigation cost increases to c_3^a then*

1. *If the agency originally chose the safe strategy its interpretation will not change.*

2. *If the agency originally chose the risky strategy then, if $c_3^a \geq \bar{c}_3^a$ its new interpretation will be less aggressive than its original interpretation, but if $c_3^a < \bar{c}_3^a$ its interpretation will not change.*

Let us first focus on case 1 of proposition 4. If the agency originally chose the safe strategy, its original interpretation was the corner solution s^{cs}. Accordingly, we know that $U(s^{cs}) \geq U(s^{is})$. Additionally, since $U_3(s^{cs}) = U(s^{cs})$ and $U_3(s^{is}) < U(s^{is})$ (because $c_3^a > c^a$), it must also be that $U_3(s^{cs}) > U_3(s^{is})$. Thus, if the agency originally chose the safe strategy, it will hold on to this strategy, and there will be no change in the agency's interpretation which remains s^{cs}.

Now, let us turn to case 2 of proposition 4. If the agency originally chose the risky strategy, its original interpretation was the interior solution s^{is}. If $c_3^a \geq \bar{c}_3^a$ then $U_3(s^{is}) \leq U_3(s^{cs})$ and following the change the agency moves to the safe strategy, choosing the corner solution s^{cs} as its new interpretation. Since $s^{is} > s^{cs}$ (corollary 1), the new interpretation is less aggressive than its original interpretation. If $c_3^a < \bar{c}_3^a$ then $U_3(s^{is}) > U_3(s^{cs})$, which means that following the change the agency holds on to the risky strategy and remains on the interior solution which did not change.

5 Conclusion

This paper explains how administrative agencies strategically choose their statutory interpretation. According to the model administrative agencies choose between the risky strategy – a relatively aggressive interpretation that provokes an appeal by the firm – and the safe strategy – a relatively non-aggressive interpretation that the firm complies with. This choice depends on the level of judicial deference, and on the firm's and the agency's litigation cost.

The paper analyzes how changes in certain parameters affect the aggressiveness of the agency's statutory interpretation. It turns out that an increase in the level of judicial deference will not necessarily result in the agency choosing a more aggressive statutory interpretation. Accordingly, when discussing the effect of an increase in the level of judicial deference two additional factors have to be taken into account: the effect of the increase in deference on the firm's threshold for appealing the agency's interpretation as well as on the marginal probability of reversal by the court. Furthermore, the model shows that the number of cases in which the court upheld the agency's interpretation cannot be used to measure the effect of an increase in the level of judicial deference.

The model also analyzes the effect of changes in the firm's and the agency's litigation cost on the agency's interpretation of the law, thus introducing a new tool for affecting the aggressiveness of agencies' statutory interpretation. The paper contains several predictions that can be tested empirically in further research.

References

Avila, Aaron P. 2000. Application of the Chevron Doctrine in the D.C. Circuit, 8 N.Y.U. ENVTL. L. J. 398.

Breyer, Stephen. 1986. *Judicial Review of Questions of Law and Policy*, 38 ADMIN. L. REV. 363.

Chevron. 1984. Chevron U.S.A. Inc. v. Natural Resources Defense Council, 467 U.S. 837.

Cohen, Linda R. and Matthew L. Spitzer. 1994. *Solving the Chevron Puzzle*, 57(2) LAW AND CONTEMPORARY PROBLEMS 65.

Elliott, E. Donald. 2005. *Chevron Matters: How the Chevron Doctrine Redefined the Roles of Congress, Courts and Agencies in Environmental Law*, 16 VILL. ENVTL. L.J. 1.

Eskridge, William N. Jr. and John Ferejohn. 1992. *Making the Deal Stick: Enforcing the Original Constitutional Structure of Lawmaking in the Modern Regulatory State*, 8 J. L. ECON. & ORG. 165.

Ferejohn, John A. and Barry R. Weingast. 1992. *A Positive Theory of Statutory Interpretation*, 12 INT'L REV. L. & ECON 263.

Merrill, Thomas W. 1992. *Judicial Deference to Executive Precedent*, 101 YALE L. J. 969.

Scalia, Antonin. 1989. *Judicial Deference to Administrative Interpretations of Law*, 1989 DUKE L.J. 511.

Schuck Peter H. and E. Donald Elliott. 1990. *To The Chevron Station: An Empirical Study of Federal Administrative Law,* 1990 DUKE L. J. 984.

Shavell, Steven. 2006. *The Appeals Process and Adjudicator Incentives.* 35 JOURNAL OF LEGAL STUDIES 1.

Stephenson, Matthew. 2006. *The Strategic Substitution Effect: Textual Plausibility, Procedural Formality, and Judicial Review of Agency Statutory Interpretations*, 120 HARV. L. REV. 528.

US General Accounting Office (1998). IRS Personnel Administration: Use of Enforcement Statistics in Employee Evaluation.