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Endogenous Obfuscation in Injury Investigations

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Eligibility for public benefits may require an injury investigation. The thoroughness of the investigation is a policy decision of the government. An investigative authority chooses the optimal effort to infer from a noisy signal (business plan) the quality of management and market conditions when a firm petitions for benefits. Under plausible conditions, firms will underperform to raise the probability of an affirmative verdict, and the authority will expend low investigative effort. Good and bad managers will obtain relief under adverse market conditions. This is preferred by good managers, as they do not have to separate by sending a costly signal.

> You gotta understand, the main ingredient in the success of any company is its management ...
>
> Lawrence Auriana, co-manager of the Kaufman Fund

INTRODUCTION

Receipt of benefits from public policy programmes frequently requires an eligibility test. In some instances this is straightforward. For example, qualifying for retirement benefits mandates only a documentation of age and a history of contributions to the programme. Unemployment benefits require a recent employment history and evidence of job search. In other cases the eligibility test is more complex. This is particularly so when eligibility requires an injury test. It is further compounded when injury can be at least partially self-inflicted and/or a result of actions by the economic agent. Examples of such cases include the material injury verdict in anti-dumping and anti-subsidy complaints, and the serious injury decision under safeguards. Circumstances in which injury to private agents by public programmes may require compensation arise when land is conserved or restricted in its use for environmental protection, and when it is appropriated for use in the public domain. It can be contended that welfare for individuals requires an injury test. This is the verification of low income, substance abuse, chronic health problems, etc. Government-sponsored disaster relief, such as for floods, typically entails an injury test; however, it is at least partially based upon location.

If it is a deliberate decision of policy to require an injury decision, it is natural to inquire as to what it is intended to accomplish, and what can be gleaned from the required investigation. It is my contention that the injury decision serves three purposes. The first is as a basis for distinguishing among the agents that receive a benefit and those that are excluded from the policy. My contention is that those agents that incur the cost of the policy are more receptive to government intervention when the agents petitioning for the benefit are not blameworthy of their condition. They are assumed to be less tolerant when injured (poorly performing) firms are ineptly managed and when

injured individuals are irresponsible. Thus, one possible (desirable) purpose of the injury investigation is to distinguish between well managed and poorly managed firms, or between responsible and irresponsible individuals.

The second purpose served by the injury decision is to justify the awarding of public benefits to the agents that incur the costs of financing them. This is important, as it is well established that individual and corporate public policy programmes impose a cost upon the economy. That is, they must be financed through the taxation of other agents, and can impose welfare costs through the distortion of relative prices. And third, the injury requirement may diffuse opposition to market liberalizing reforms. That is, the government may commit to protecting agents that are harmed by market liberalization to weaken anti-market coalitions.

On the other hand, political influence may affect the injury judgment of the pertinent authority.[1] This suggests a potential abuse of the injury requirement in public policy. The injury requirement may be a vehicle by which the government justifies the protection of mismanaged firms or irresponsible individuals to a broader constituency. Because political influence is more likely to be wielded by firms than individuals, I will focus in this paper on public policy programmes designed to help industry.[2]

This raises the question as to what constitutes a good manager. Is it someone who generates profits by efficiently allocating inputs, maintaining inventories and sustaining research and development? Is it someone who is good at obtaining favours from the government? Is it both? If it is both, then a politicized injury investigation facilitates making decisions that are most consistent with the social interest. That is, the awarding of public policy benefits is most within the tolerances of those adversely affected by it. However, in the example of international trade policy, it is difficult to contend that the US motor vehicle and integrated steel industries, which received administered protection in the 1980s, were well managed during this period. It is reasonable to contend, however that they were and are politically influential.

In view of the above discussion, I will term an investigative process 'politicized' or 'dysfunctional' when it is willing to award, as a matter of policy, public benefits to politically influential, but poorly managed, firms, that is, when the authority uses the investigation to justify the awarding of a public benefit to those economic agents adversely affected by implementation of the policy. A regime is labelled functional when it awards the benefit only to firms with high-quality managers facing adverse market conditions. To further this distinction between investigative regimes, I will suppose that maintaining social support for the public policy requires that the authority not be completely perverted by politics. That is, it still must attempt to award the protection to those firms for which the agents incurring a cost of the benefit are most willing to tolerate such a sacrifice. Thus, my approach acknowledges two influences upon public policy: (1) firms adversely affected by competition will try to block market liberalization that does not provide them a safe harbour when their performance is poor, and (2) firms and consumers adversely affected by the public policy will try to block the introduction of such a mechanism that is likely to be too generous in making affirmative verdicts. This includes making them when market conditions are good as well as when petitioning firms are mismanaged. Because the optimal level of investigative effort may be less than

that which fully discloses managerial type and market conditions, the losers from protection may not be able perfectly to monitor whether or not the investigative authority is dispensing political favours. Thus, I deem a regime *dysfunctional* when it does not attempt to distinguish between managerial types. I attribute this to political influence. The losers from the policy constrain the process by precluding the authority from placing greater weight on protecting mismanaged than on well managed firms.

Within this framework, the paper demonstrates several points. First, the thoroughness of the injury assessment is a policy decision.[3] Second, both good and bad managers prefer a politicized regime, that is, one in which the authority does not care if poorly performing firms have good or bad managers. Third, it may be optimal for the government to make mistakes in its decisions granting or denying the benefit when it would decide otherwise under complete information. Fourth, management may deliberately under-perform to raise the probability of an affirmative verdict. This is an additional cost that the public policy may impose which traditional forms of protection (such as tariffs) do not. Fifth, that although pooling and separating equilibria are analytically possible, the most plausible equilibrium is semi-separating, with the authority only able to infer market conditions. Because of this, there is ample opportunity for the investigative process to be subverted by politics. Thus, even though economic agents that are harmed by the policy do not want to support a regime that protects poor managers, the public policy regime that they would prefer may not be an option. Therefore there may not be a requirement in public policy laws that directs the investigative authority to assess managerial quality, even though that would be preferred by those upon whom the benefit imposes a cost. In fact, in a politicized regime the authority may prefer obfuscation in the investigation process to a clear revelation of the types of firm being protected. Hence I conclude that a public policy programme in which the injury decision is dispositive entails three perverse features: (1) it can induce deliberate underperformance; (2) it induces low levels of investigative effort in which the authority does not or cannot infer managerial quality; and (3) it rewards inept management.

The discussion of the decision to petition and the thoroughness of the investigation will be in the tradition of the papers that examine the effects of existing public programmes;[4] that is, the paper contains a model of how investigations are conducted. One might reasonably contend that the revelation principle should be at work; that the investigation should be designed so that managers reveal their type. This is an important, albeit different, issue: the optimal design of public policy programme.[5] Because negative decisions do occur in the application for a public benefit, it is probable that the revelation principle is not at work; that is, managers are not revealing their type by their decision to petition. Hence I provide a model of an investigative process in which the authority attempts to distinguish between the types of petitioner and the circumstances in which they petition.

The paper specifies a model in which the investigative authority chooses the level of effort to distinguish between high-quality (injured) and low-quality (mismanaged) firms, and between good and bad market conditions. The investigative authority's information is incomplete. It knows the distribution of the two types of manager, but not the realization of the petitioning firm. It also

knows the distribution of market conditions, but not their realization. Each type of manager chooses whether or not to petition on the basis of the level of effort, which the government credibly selects, and the expected benefit of an affirmative verdict.[6]

I. The Injury Determination

The government, in response to a complaint by a constituent firm, must assess the existence of material injury before public benefits can be awarded.[7] The determination of injury is made through an investigation conducted by an agency of the government. Such an investigation will rely upon data submitted by the firm to the investigative authority, and will likely be confidential.[8] Conducting the investigation is costly to the government, and filing the petition and complying with the government's request for documentation of injury is costly to the firm. The degree of thoroughness of the investigation is a policy decision of the government.

It is well established in the finance literature that a firm's management may be better informed than investors about the riskiness of an investment that a firm is undertaking or a security that it is issuing. This is despite the fact that the financial industry employs analysts that are specialists in particular industries.[9] It is also possible that the quality of a firm's management may be mis-assessed by the financial market.[10] These recognitions have important implications for the injury investigation by the government. Even if its investigative authority utilizes industry analysts in its injury investigations, there is no reason to believe that they are any more accurate than financial market analysts in assessing the cause of injury or the quality of management. Thus, inappropriate injury determinations might well be expected as the outcome of investigations by the government.

In stating that the material injury decision may be inappropriate, this is in the context of the investigative authority's objective function. (Note here that the investigative authority and the government have the same objective function. There are no principal–agent problems.) To the extent that political influence is important, determining managerial quality recedes in importance, and the assessment of market conditions becomes paramount. The accuracy of the investigative authority's injury assessment depends upon the thoroughness of the investigation; that is, it can mistakenly award or withhold protection.

In conducting its investigation, the authority requests data from the petitioning firm concerning prices, profits, output, sales, inventories, wages, employment, cost of capital, tax payments, research and development expenditures, cash level and rates of change in these variables for a designated period of time. This will be deemed the manager's business plan. It is supposed that this plan is indexed by $b^i \in R+$, where $i = H(L)$ denotes a business plan by high (low)-quality management. A higher value of b^i denotes a better business plan, that is, one more appropriate to market circumstances.

Market conditions are denoted by $\alpha \in \{\underline{\alpha}, \overline{\alpha}\}$, with $\overline{\alpha} > \underline{\alpha}$ in $R+$. A higher value of α indicates a more favourable market. High (low)-quality managers are indicated by $\theta^H(\theta^L)$, where $\theta^H > \theta^L$ in $R+$. There are $\lambda = (0, 1)$ high-quality managers in the economy. The investigative authority knows λ, but does not know the realization of θ^i when a petition is filed. Similarly, it knows that poor

market conditions occur with frequency $\delta = (0, 1)$. It is supposed either that there is a single firm or that firm management in the industry is homogeneous.[11] (Summary of the notation utilized in the paper is provided in Table 1.)

The authority's investigation reveals the noisy signal b^i. However, θ^i and α cannot be directly observed; that is, when b^i-is observed, the authority may not know whether $i = H$ or $i = L$. It is easy to accept that θ^i must be inferred. That α cannot be directly observed requires some justification. For tractability, α is intended to encompass the level of aggregate economic activity, such as the rates of growth, unemployment and inflation. It also reflects market definition and competitor identification issues. This is not necessarily transparent, and may require the calculation of cross-price elasticities of demand. It also may require the acquisition of data relating to the firm's production of the pertinent products. Given the difficulty of accurately defining an industry, determining the extent to which heterogeneous products compete with the products for which a petition is filed, or ascertaining whether or not the economy is currently in a recession, it is reasonable to suppose that α must be inferred.

The accuracy of the investigative authority's injury determination is a function of its effort $e = [0, \tilde{e}]$, where $\tilde{e}$ is the level of effort that yields a completely accurate assessment of θ^i and α. Letting $e = 0$ normalizes the minimum level of effort that meets the requirement of the legal mandate. Effort is costly to the investigative authority. The authority's cost of conducting the

TABLE 1

Symbol	Description
α	level of market conditions
θ^i	management quality
e^*	optimal level of investigative effort
$\tilde{e}$	level of effort at which information is complete
f	filing cost of a firm
$g(e)$	cost to authority of conducting an investigation
$w^{i\alpha}$	weights the authority assigns to protecting management quality–market condition pairs
δ	frequency of poor market conditions
λ	frequency of high-quality managers
b^{i*}	optimal business plan of managerial quality i in the absence of the policy
$\tilde{b}^{i*}$	optimal business plan of managers i when they petition for the benefit
π^i	profits of managerial quality i in the absence of the public policy
α'	market conditions when the benefit is awarded
$\tilde{\pi}^i$	expected profits of management quality i when they petition for the benefit
$p(e;\ b^i)$	probability that management i receives the benefit when it chooses b^i and the authority selects e
$\gamma^{i\alpha}$	expected gain in profits from petitioning by managers of quality i in market conditions α
$p(\theta^i, \alpha)$	authority's beliefs prior to observing $\tilde{b}^{i*}$
G	expected payoff function of the authority
$B_\alpha(e)$	interval of ambiguity over market conditions for the authority when it chooses effort e
$B_\theta(e)$	interval of ambiguity over managerial quality for the authority when it chooses effort e
$\tilde{p}(\theta^i, \alpha)$	Bayesian updated probability assessment of authority that management is quality i and market conditions are level α

investigation is given by $g(e)$, where $g', g'' > 0$. It is assumed that the authority makes a credible commitment to a level of effort to ascertain injury in the investigation. This level of effort is known to the firm prior to its decision to petition for relief from competition. The firm's cost of filing is given by f. The filing cost is constant, as the business plan submitted to the authority is already determined by the known (in equilibrium) level of e.

As noted above, the government (investigative authority) may assign different degrees of importance, arising from political considerations, to protecting high- and low-quality managers under good and bad market conditions. Let $w^{i\alpha}$, $i = H, L$ and $\alpha \in \{\underline{\alpha}, \overline{\alpha}\}$ denote the weight assigned to protecting the four managerial quality–market conditions pairs in the investigative authority's objective function.

The game of the decision to petition and the conducting of the investigation is depicted as follows.

1. Nature determines α, λ and $w^{i\alpha}$, which are revealed to both the firm and the authority.
2. The investigative authority chooses and reveals e^*, its optimal investigative effort, for any b^i that it may observe.
3. The firm learns its managerial quality and market conditions.
4. The firm chooses b^i, and decides whether or not to file.
5. If it files, the authority investigates and announces its decision. The public benefit is awarded when the decision is affirmative.

The game is solved for a perfect Bayesian equilibrium. In order to preclude actions that are off the equilibrium path the authority interprets any such action as corresponding to the managerial quality–market conditions pair having the lowest $w^{i\alpha}$.

The investigative authority

Let us say that the government's investigative authority receives a complaint from the firm. The authority submits a detailed questionnaire, and possibly visits the firm to ascertain its business plan b^i, $i = H, L$. The authority attempts to infer the market conditions α and the firm's managerial quality θ^i from b^i. A petitioning firm may manipulate variables under its control prior to its petition so as to appear injured and to increase the probability of an affirmative verdict.[12] This paper can accommodate such deceptive behaviour through the choice of the business plan of the petitioning firm. For example, high-quality managers may be able to induce the authority to decide affirmatively by choosing a lower value of b^H, for a given α, than they would select as a profit-maximizer when a public benefit was not at issue. In other words, they may attempt to convince the authority that market conditions are bad.

The payoff to the investigative authority arises from the increase in expected profits of firms receiving the benefit. The increase in profits will be weighted by the political importance of providing protection in each managerial quality–market conditions combination. To calculate the increase in profits, define the firm's profit function *sans* the policy as

$$\pi^i = \pi^i(b^i, \alpha, \theta^i), \qquad i = H, L. \tag{1}$$

In (1), the profit function for either realization of management depends upon its business plan, market conditions and management quality. Assuming that the profit functions are strictly concave and continuous in business plans, we can state that

$$b^{i*}(\alpha, \theta^i) = \text{argmax } \pi^i(b^i, \alpha, \theta^i). \tag{2}$$

Let us now introduce the public policy programme. Because the authority must interpret a noisy signal b^i to determine managerial quality and market conditions, let $p(e;\ b^i)$ denote the probability of receiving the benefit when b^i is transmitted and e is expended. Firm managers may take account of the effect of their business plan on the probability of receiving public benefits in maximizing the expected profits function,

$$\tilde{\pi}^i = p(e;\ b^i)\pi^i(b^i, \alpha', \theta^i) + (1 - p(e;\ b^i))\pi^i(b^i, \alpha, \theta^i). \tag{3}$$

To preserve consistency with the assumption that there are two realizations of market conditions, let $\alpha' = \alpha + \mathrm{d}\alpha$, $\alpha \in \{\underline{\alpha}, \overline{\alpha}\}$. That is, the protection from an affirmative verdict raises α. It is assumed that firms know $\mathrm{d}\alpha$. Thus, market conditions are denoted by α' when the verdict is affirmative and by α when it is not. Let

$$\tilde{b}^{i*} = \text{argmax } \tilde{\pi}^i(b^i, \alpha', \alpha, \theta^i). \tag{4}$$

Equations (2) establish that there is a unique profit-maximizing business plan for each quality of manager and each realization of market conditions in the absence of the public policy. Equations (4) disclose a unique expected profit-maximizing business plan for each quality of manager and market realization under protection. This is a direct implication of the assumption of strict concavity of the profit functions. It is further assumed that $\partial\pi^H/\partial b^i > \partial\pi^L/\partial b^i \,\forall\, b^i \leqslant b^{L*}$ and $\alpha \in \{\underline{\alpha}, \overline{\alpha}\}$. Thus, $b^{H*} > b^{L*}$ for either value of α. An analogous assumption is made for the expected profit functions $\tilde{\pi}^i$. Hence $\tilde{b}^{H*} > \tilde{b}^{L*} \,\forall\, \alpha \in \{\underline{\alpha}, \overline{\alpha}\}$. Thus, high-quality managers will always choose a higher value of $\tilde{b}^{i*}$ (a better business plan) than will low-quality managers. It is also assumed that $(\partial\pi^i/\partial b^i)\partial b^i/\partial\alpha > 0$; that is, better market conditions induce a higher value of b^i and hence higher profits. Alternatively, either type of manager operates more effectively in good markets than in bad markets. This also holds for the expected profit functions. It presents a problem for investigators that are attempting to infer market conditions and managerial quality from a firm's business plan. For a given value of $\tilde{b}^{i*}$, the investigators may not be able to ascertain whether they are observing high-quality managers in a bad market or low-quality managers in a good market. The authority's difficulty is underscored by its having to infer the values of two parameters (θ^i and α) through its selection of a single choice variable (e), upon observing the noisy signal $\tilde{b}^{i*}$.

As was indicated above, a higher value of b^i-denotes a better business plan. It was also stated that profit functions are concave in b^i. What I intend to convey by these assumptions is demonstrated in the following example. Inventories of material inputs and production are part of a firm's business plan. Since inventories are costly to maintain, a business plan with low inventories is superior to one in which they are high. However, low-quality

managers require higher inventories to function effectively than do high-quality managers. Hence low-quality managers may choose higher inventories, which will lower b^i below the value of b^{i^*} at which profits are maximized for high-quality managers. Furthermore, when low and high-quality managers select the same business plan, the high-quality managers earn higher profits. This is because they are able more effectively to implement the objective decisions contained in the plan.

In order to calculate the net expected gain to the investigative authority from its judgments, recall that the public policy raises the value of α for firms receiving positive verdicts, and does not affect its value for negative decisions. Letting α' denote the improved market conditions when an affirmative verdict is rendered permits $\gamma^{i\alpha}$ to be defined as

$$\gamma^{i\alpha} \equiv \pi^i(\tilde{b}^{i^*}, \alpha', \cdot) - \pi^i(\tilde{b}^{i^*}, \alpha, \cdot). \tag{5}$$

The improvement in profits is the actual profits, given implementation of the *ex ante* business plan $\tilde{b}^{i^*}$ and a positive finding, less the actual profits after implementing the same plan and receiving a negative verdict. Definition (5) depicts the improvement in firm profitability in response to a favourable petition. In keeping with the emphasis about the importance of managerial quality, $\gamma^{H\alpha} > \gamma^{L\alpha}$; that is, high-quality managers are better able to take advantage of the public policy under any market conditions. It is also assumed that $\gamma^{i\underline{\alpha}} > \gamma^{i\overline{\alpha}}$. The justification is that either managerial type is better able to withstand competition when market conditions are favourable. Further, $\gamma^{L\underline{\alpha}} > \gamma^{H\overline{\alpha}}$; i.e., low quality managers may still derive substantial benefits from a mitigation of competition in adverse markets.

As will be disclosed, separating, semi-separating and pooling equilibria may emerge from the game. Hence, the single crossing condition must hold. This is satisfied by

$$\partial^2(\gamma^{H\alpha} - \gamma^{L\alpha})/\partial b^i \partial \theta^H > 0. \tag{6}$$

In words, for each market condition α, it is more costly for low-quality managers to execute a high-level business plan than it is for high-quality managers to do so.

For either realization of management to be willing to petition for relief from competition, participation constraints must be satisfied. Letting $p(e; \tilde{b}^{i^*})$ denote the probability of receiving the benefit when the noisy signal $\tilde{b}^{i^*}$ is transmitted, the participation constraint can be stated as[13]

$$p(e; \tilde{b}^{i^*})\gamma^{i\alpha} \geqslant f, \qquad i = H, L \qquad \text{and} \qquad \alpha \in \{\underline{\alpha}, \overline{\alpha}\}. \tag{7}$$

Inequality (7) indicates that the expected gain from petitioning for benefits when $\tilde{b}^{i^*}$ is the optimal business plan must be at least as great as the filing cost. Recall that this paper is modelling the injury investigation, and as such does not invoke the revelation principle. Hence the investigation must take place, and such constraints are not included in the model.

As the investigative authority expends effort to interpret $\tilde{b}^{i^*}$ in its injury investigation, it engages in Bayesian updating of its prior beliefs. Its priors are based upon its awareness that there are λ high-quality managers and δ poor market realizations in the economy. Thus, the authority's prior beliefs can be

stated as:

$$
\begin{aligned}
&p(\theta^H, \underline{\alpha}) = \lambda\delta,\\
&p(\theta^H, \overline{\alpha}) = \lambda(1-\delta),\\
&p(\theta^L, \underline{\alpha}) = (1-\lambda)\delta, \text{ and}\\
&p(\theta^L, \overline{\alpha}) = (1-\lambda)(1-\delta).
\end{aligned} \tag{8}
$$

In the first equation of (8), the authority's prior belief is that the probability that a petition has been submitted by high-quality managers in poor market conditions is $\lambda\delta$. The other equations are interpreted analogously. The authority engages in updating in accordance with Bayes's Rule as it applies effort to interpret $\tilde{b}^{i*}$.

How the probability of an affirmative finding responds to investigative effort by the authority will depend upon the extent of political influence on the process. If the public policy programme is implemented in a manner most acceptable to the economic agents that it harms, Bayesian updating by the authority in which it increases the likelihood that it is investigating well managed firms in poor market conditions will raise the probability of an affirmative verdict. It will reduce the probability of an affirmative verdict when updating increases the probability that a firm is well managed, but market conditions are good. Correspondingly, updating that increases the probability that the petition has been submitted by a mismanaged firm under any market conditions will result in a reduced probability of a positive judgment.

In a public policy regime that has been compromised by political influences, the probability of an affirmative verdict in response to Bayesian updating will differ from that of a system for which acceptance is likely to be more widespread. I will suppose that political influences are realized through an increase in the probability of a positive verdict when updating raises the probability that the petitioner is mismanaged and market conditions are poor. Updating that raises the probability that market conditions are favourable lowers the likelihood of a successful petition for either managerial quality. Updating always increases the probability of an affirmative judgment when it raises the probability that managerial quality is high and market conditions are poor.

It is now appropriate to specify the objective function of the investigative authority, which is assumed to be identical with that of the government. To do so, let us define $\tilde{p}(\theta^H, \underline{\alpha})$ as the updated probability assessment of the authority. That is, $\tilde{p}(\theta^H, \underline{\alpha})$ represents the updated probability, based upon the expenditure of e to interpret $\tilde{b}^{i*}$, that $\theta = \theta^H$ and $\alpha = \underline{\alpha}$. The expected payoff function of the authority can now be

$$
\begin{aligned}
G(e) = \int_{\underline{b}}^{\bar{b}} p(e;\, \tilde{b}^{i*})[&\tilde{p}(\theta^H, \underline{\alpha})\gamma^{H\underline{\alpha}} w^{H\underline{\alpha}} + \tilde{p}(\theta^H, \overline{\alpha})\gamma^{H\overline{\alpha}} w^{H\overline{\alpha}}\\
&+ \tilde{p}(\theta^L, \underline{\alpha})\gamma^{L\underline{\alpha}} w^{L\underline{\alpha}} + \tilde{p}(\theta^L, \overline{\alpha})\gamma^{L\overline{\alpha}} w^{L\overline{\alpha}}]\,\mathrm{d}\tilde{b}^{i*} - g(e),
\end{aligned} \tag{9}
$$

where $\bar{b}(\underline{b})$ are the best (worst) business plans that managers could choose. These are known to the authority.

The objective function indicates that the authority values increase profits in the economy irrespective of their source.[14] Profits of the petitioners and the cost of conducting the investigation are all that matter to the authority. Although the authority and the government of which it is an agent are assumed to have the same objective, (9) is to be distinguished from a welfare function.[15] (As noted earlier, problems of agency between the authority and the government are not considered.) In (9), there must be some parameters under which the authority operates; otherwise it could simply maximize its payoff by declaring all petitioners injured after conducting an investigation entailing minimal effort. These parameters are the $w^{i\alpha}$, which may be construed as the reduced form of the political process. This process places different values upon mitigating the competition facing firms in good and bad markets, and upon protecting high and low-quality managers.[16]

The existence of a public policy law cum investigative process may be viewed as a means by which opposition to market liberalization is diffused. Just as firms that are harmed by competition may impose limits on the negotiation of liberalization, so economic agents that are harmed by restricting markets may impose limits on the awarding of affirmative verdicts to petitions for relief from competition. I assume that these limits are manifest through the authority never placing more value on protecting a firm when market conditions are good than when they are bad, and never placing more value on protecting low-quality managers than on high-quality managers. Further, I contend that a public policy regime that values an increase in profits for high-quality managers by more than it does for low-quality managers when market conditions are bad is a regime that is preferable to the losers from competition mitigation. Thus, I claim that a regime that does not do this is one that is compromised by political influence. Recall the discussion in the introduction, in which the definition of a high-quality manager was considered. I am supposing here that low-quality managers attempt political influence to compensate for managerial deficiencies, and that high-quality managers are at least as productive in managing their firms as they are in influencing the government. As I noted in the introduction, a politicized investigative system is preferable if high-quality managers are also better at eliciting favours from the government than are low quality managers. This will facilitate distinguishing between the two managerial types through the investigative mechanism. However, if high quality managers substitute effort in obtaining favours for managerial effort, this position is compromised.

None the less, what matters in (9) is that the authority place different weights on at least two of the four possible managerial quality-market conditions combinations. This may induce a nonzero e^* by the authority, and induce signalling by firm managers through b^i. In (9), the authority is disclosed as making two decisions. First, it chooses its optimal level of effort e^*. Then, after receiving a petition and observing $\tilde{b}^{i*}$, it decides whether or not to protect the firm. The optimal level of effort satisfies

$$(10) \qquad e^* = \text{argmax } G(e), \qquad e^* \geqslant 0.$$

Since $g(e)$ is a convex function, assuming that probabilities are linear in e insures that the second-order condition is satisfied. When $e^* = 0$, the authority

decides randomly. Recalling that e^* is credibly chosen prior to the firm's decision to petition underscores the importance of the investigation as a matter of policy.

The firm

Now that the authority's optimal effort in its injury assessment has been disclosed, the firm's decision regarding the petition for relief from competition can be discussed. It is supposed that the participation constraint (7) is satisfied for at least some managerial quality-market condition pair for the problem to be interesting. As was noted earlier, there may be values of $\tilde{b}^{i^*}$ for which the authority cannot be certain of the type of manager and/or market conditions of a petition.

Let us define $\beta_\alpha(e)$ as a closed interval in $R+$ of business plans in which the authority cannot distinguish market conditions $\underline{\alpha}$ from $\overline{\alpha}$. The length of this interval is a function of the effort the authority makes in its investigation to collect and interpret information in the petitioner's business plan. Analogously, $\beta_\theta(e)$ is closed interval in $R+$ of business plans in which the authority cannot distinguish θ^H from θ^L. Once again, the length of this interval is a function of e. Objective data are available to enable an inference to be made by the investigative authority as to whether market conditions are good or bad. My contention is that management quality is more nebulous in its measurement than market conditions. Quantitative measures of managerial quality do exist, such as return on assets, but these are most meaningful in comparison with other firms in the same industry. Furthermore, accounting data are subject to some manipulation, as in the timing of discretionary charges. It is my impression that professional investors, at least to some degree, form subjective assessments of the quality of a firm's management. Thus, it seems reasonable to assume that $\beta_\alpha(e)$ is nested within $\beta_\theta(e)$. Higher levels of e reduce the length of each interval. As nested intervals must have a point in common, the level of effort $\tilde{e}$ that identifies this point leaves no ambiguity as to market conditions or managerial quality.

The values of the $w^{i\alpha}$ provide some insight as to the level of e^* that maximizes (9). For $w^{H\underline{\alpha}} = w^{H\overline{\alpha}} = w^{L\underline{\alpha}} = w^{L\overline{\alpha}}$, the distinctions that may be disclosed by an investigation are of no importance to the authority, and it will set $e^* = 0$. This is the normalized minimum effort consistent with the legal requirements of the policy. That is, if the authority places the same weight on protecting both qualities of management and the same weight on protecting firms in good and bad markets, there is no point in conducting an investigation. If relief is not a certainty, the authority can allocate this benefit randomly. For $w^{H\underline{\alpha}} = w^{L\alpha} > w^{H\overline{\alpha}} = w^{L\overline{\alpha}}$, the distinction between market conditions matters, but the distinction between managerial qualities does not. Since the former is assumed to be easier to make than the latter, a relatively low (but positive) e^* is expected. This is the dysfunctional or politicized regime, as mismanaged but politically influential firms benefit from the same imperative for relief from competition as capably managed ones. (Recall that I am assuming that low-quality managers attempt to use the political process to compensate for their managerial deficiencies.) In the functional regime, $w^{H\underline{\alpha}} > w^{L\underline{\alpha}} = w^{L\overline{\alpha}} = w^{H\overline{\alpha}}$. Distinguishing between manager

types matters when market conditions are unfavourable.[17] In this regime the authority intends to protect only high-quality managers in adverse markets. As was indicated in the introduction, this is the outcome that is most within the tolerances of those economic agents that incur the costs of the policy. This regime mandates the highest value of e^*. I will conclude, however, that the equilibrium in which $w^{H\underline{\alpha}} > w^{L\underline{\alpha}}$ with full separation may, in practice, be difficult to generate. That is, by identifying the conditions needed for full separation. I disclose that the most plausible outcome is the one in which $w^{H\underline{\alpha}} = w^{L\underline{\alpha}}$.

At this juncture, the equilibria to the investigation/petition game can be identified. They are categorized as pooling equilibria (PE), separating equilibria (SE), and semi-separating equilibria (SSE). In each of these, $e^* < \tilde{e}$. In each equilibrium, the $\tilde{b}^{i^*}$ that satisfy (4) and (7) are determined with the authority's choice of e^* known to both managerial types. The participation constraint is satisfied for both types and for both market conditions at $\tilde{b}^{i^*}$. The authority's choice of e^* satisfies (10). In choosing e^*, the authority maximizes its payoff for any signal $\tilde{b}^{i^*}$ that it may receive from the petitioner. It expends e^* in interpreting the signal, which induces a revision of its prior beliefs stated in (8). In calculating e^*, the authority knows the $p(e;\ \tilde{b}^{i^*})$ for all $e = [0, \tilde{e}]$ and all $\tilde{b}^{i^*} = [b, \bar{b}]$. It also knows how the updated probabilities $\tilde{p}(\cdot)$ respond to changes in e for any $\tilde{b}^{i^*}$. In all the equilibria considered, $\tilde{b}^{i^*} = B_\alpha(e^*)$ for at least two managerial quality-market conditions pairs. Hence, $\tilde{b}^{i^*} = B_\theta(e^*)$. All types/pairs will petition if they can, in equilibrium, select $\tilde{b}^{i^*}$.

Pooling equilibria There are four PEs that can result in the present framework. They permit the following proposition to be stated.

Proposition I. A credible and optimal investigative effort in which the authority is unable to infer market conditions and managerial quality from any b^i that satisfies the participation constraint induces a PE in which both types petition under both market conditions and $e^* = 0$, irrespective of whether or not the investigation process is functional.

For the intuition of the first PE, suppose that the process is functional and market conditions are unfavourable. In this instance, high-quality managers would like to separate. However, $\tilde{b}^{i^*}$, $i = H,\ L$, is within the interval of ambiguity about market conditions, and hence managerial quality. Separation by the high-quality managers requires a b^H that exceeds the highest value of b^i in $B_\theta(e^*)$. However, choosing a b^H that exceeds the highest b^i in $B_\alpha(e^*)$ induces the authority to infer that market conditions are favourable ($\alpha = \overline{\alpha}$). If they choose a b^H that is less than the lowest value of $B_\alpha(e^*)$, they can convince the authority that $\alpha = \underline{\alpha}$. However, by the single crossing condition, they become imitable by type-L (low-quality) managers. Suppose that the participation constraint is satisfied for type-L managers at the largest value of b^i in $B_\alpha(e^*)$ when $\alpha = \underline{\alpha}$ and for both managerial types when $\alpha = \overline{\alpha}$. Suppose that it is also binding for some b^H that is in $B_\alpha(e^*)$, where $b^H < \tilde{b}^{H^*}$. Since $\gamma^{H\underline{\alpha}} > \gamma^{L\underline{\alpha}} > \gamma^{i\overline{\alpha}}$, the participation constraint must bind for all managerial type-market conditions pairs for such a b^H. This will result in neither market conditions nor managerial quality being disclosed.

Another PE can arise in a politicized regime, in which the authority sets $w^{H\underline{\alpha}} = w^{L\underline{\alpha}}$, and in which $\alpha = \underline{\alpha}$. In this case there is no incentive for type-H (high-quality) managers to reveal their quality. However, there is an inventive for either type to reveal market conditions. Thus, they want to choose a low b^i to disclose the poor conditions. This requires a b^i that is below the lowest b^i in $B_\alpha(e^*)$. Suppose that the participation constraint is violated for both types. Since $\gamma^{i\underline{\alpha}} > \gamma^{i\overline{\alpha}}$, it must also be violated when market conditions are favourable. Thus, separation cannot occur for market conditions.

A third and a fourth PE can occur when $\alpha = \overline{\alpha}$ under either a functional or a politicized regime. Neither managerial type wants to reveal that market conditions are favourable, as that would, through Bayesian updating, preclude protection. Hence each type must choose a b^i that is below the lowest value in $B_\alpha(e^*)$ for either regime. If the participation constraint is violated for both types for b^i when $\alpha = \underline{\alpha}$, it must be violated when $\alpha = \overline{\alpha}$ ($\gamma^{i\underline{\alpha}} > \gamma^{i\overline{\alpha}}$). Hence neither type can convince the investigative authority that market conditions are adverse, so the PE must result. Because, in a PE, the investigation does not disclose any information that will permit the authority to infer market conditions or managerial type, $e^* = 0$. Thus, the authority engages in the most cursory investigation that is consistent with the legal provisions of the policy. As a result, both types of firm petition, and it may be optimal to mistakenly grant or deny the benefit.

Separating equilibrium There is an SE that can arise in this context. It permits us to state a second proposition.

Proposition 2. A credible and optimal investigative effort, in a nonpoliticized regime in which the authority is able to infer market conditions and managerial type from a b^H that satisfies the participation constraint, induces a SE in which only high-quality managers petition, and do so only when market conditions are poor.

Suppose that $\tilde{b}^{i*}$ satisfies the participation constraint for both managerial types in unfavourable markets. Given our assumptions, $\tilde{b}^{L*} < \tilde{b}^{H*}$ for each value of α, and $\tilde{b}^{H*}$ for $\underline{\alpha}$ is less than $\tilde{b}^{L*}$ for $\overline{\alpha}$. In order to separate, high-quality managers must incur a cost of signalling. If they choose a $b^H < \tilde{b}^{H*}$ to convey that $\alpha = \underline{\alpha}$ to the authority, they become imitable by type-L managers. Hence they must select a b^H that exceeds their ability to manage most effectively; that is, $b^H > \tilde{b}^{H*}$. (This may entail, for example, operating with inventories that are suboptimal.) For separation to occur, b^H must violate the participation constraint for type-L managers, while satisfying it for type-H managers, when $\alpha = \underline{\alpha}$. (Recall that $\gamma^{H\underline{\alpha}} > \gamma^{L\underline{\alpha}}$.) The b^H must be less than $\tilde{b}^{L*}$, when $\alpha = \overline{\alpha}$. Thus, $b^H < \tilde{b}^{H*}$ for $\alpha = \overline{\alpha}$. This b^H must also violate the participation constraint for both managerial types when $\alpha = \overline{\alpha}$. Since both managerial types will petition when invoking business plans $\tilde{b}^{i*}$ when $\alpha = \overline{\alpha}$, the level of investigative effort e^* must be sufficiently high to exclude these $\tilde{b}^{i*}$ from $B_\theta(e^*)$. Thus, only type-H managers petition, and hence reveal their types by the act of petitioning. Further, they also disclose that $\alpha = \underline{\alpha}$. Note that, while high-quality managers sacrifice profits through a suboptimal business plan to separate, they are gaining protection with certainty. However, type-H

managers may not do as well under separation as they would by choosing $\tilde{b}^{H*}$ without being able to separate in a PE. That is, $\pi^i\ (e^*; b^H, \alpha', \theta^H)$ may be less than $\tilde{\pi}^i\ (e^*; \tilde{b}^{H*}, \alpha', \alpha, \theta^H)$, where the latter is the expected profits from the gamble taken in a PE. As $\lambda \rightarrow 1$, the benefits to high-quality managers from separation approach zero. However, managers that do not incur the cost of separation will be construed by the authority as type-L. Hence type-H managers must separate when it is possible. They are the only type that petitions, and the petition is manifest only when $\alpha = \underline{\alpha}$.[18]

Semiseparating equilibrium There are two SSEs that are possible, which permits a third proposition.

Proposition 3. A credible and optimal investigative effort in which the authority is able to infer market conditions but not managerial type from a b^i that satisfies the participation constraint induces a SSE in which both managerial types petition, irrespective of whether or not the investigative process is functional, but only under unfavourable market conditions.

In a SSE, both management types can choose a business plan that will permit the authority to correctly infer the unfavourable market conditions. If $w^{H\underline{\alpha}} = w^{L\underline{\alpha}}$, the high-quality managers have no incentive to reveal themselves. Both managers disclose market conditions by choosing a b^i that is less than $\tilde{b}^{i*}$ in the interval of ambiguity. This requires that the participation constraints hold for b^i when $\alpha = \underline{\alpha}$, but not when $\alpha = \overline{\alpha}$. In this case, both management types deliberately underperform to obtain an affirmative injury verdict.

As in the SE, the firms may or may not gain by being able to semi-separate. As $\delta \rightarrow 1$, the gain from semi-separation diminishes for both types. Furthermore, they are incurring a cost of semi-separation by choosing b^i instead of $\tilde{b}^{i*}$. If managers do not semi-separate when it is feasible, the authority will infer that $\alpha = \overline{\alpha}$ and reject the petition. Hence, both types petition, but only when $\alpha = \underline{\alpha}$. Furthermore, $e^* > 0$, exceeding that of PE. However, it is likely to be below that of a SE, as the authority does not have to set an e^* to exclude the $\tilde{b}^{i*}$ from $B_\alpha(e^*)$ for $\alpha = \overline{\alpha}$.

Now suppose that $w^{H\underline{\alpha}} > w^{L\underline{\alpha}} \geqslant w^{i\overline{\alpha}}$ and $\alpha = \underline{\alpha}$, but that high-quality managers cannot choose a b^H that is above the interval of ambiguity for managerial quality, even though its participation constraint is satisfied. This is because $B_\alpha(e^*)$ is nested within $B_\theta(e^*)$, and the authority will interpret market conditions as favourable. If they select a b^H that is below the interval of ambiguity about market conditions, they can convey to the authority that $\alpha = \underline{\alpha}$ with certainty. However, by the single crossing condition, they can be mimicked by low-quality managers. Suppose that high-quality managers cannot raise b^H above $\tilde{b}^{H*}$ because the participation constraint for every such b^H in $B_\alpha(e^*)$ is also satisfied either for type-L managers when $\alpha = \underline{\alpha}$ or for both types when $\alpha = \overline{\alpha}$. Thus, full separation is not possible. Once again, both types petition, but only when $\alpha = \underline{\alpha}$.

The paradox, then, is that type-H managers would prefer a politicized regime in which they did not have to incur the cost of revealing their type. They would also prefer to not have to incur the cost of semi-separation. However, separation is likely to be more costly than semi-separation. (This is apart from

a preference for a politicized regime if type-H managers were assumed to be good at eliciting favours from the government.) Although analytically possible, I contend that this equilibrium is unlikely to be observed even in a functional regime, because it requires $\gamma^{H\underline{\alpha}}$ to be substantially greater than $\gamma^{H\overline{\alpha}}$ for the participation constraints to be satisfied and violated as indicated. It also requires a relatively high value of e^*. This is to preclude satisfaction of the participation constraint for all other managerial quality-market conditions pairs. (Recall that the $\gamma^{i\alpha}$.)

Thus, I contend that an investigative outcome in which only market conditions are revealed may be the most plausible. This is either because the authority (a) doesn't know whether a firm has high or low-quality managers (separation cannot occur), or (b) doesn't care ($w^{H\underline{\alpha}} = w^{L\underline{\alpha}}$). The latter regime is, in my framework, dysfunctional.

These equilibria indicate that the government's choice as to the thoroughness of its investigation is an important policy decision. It affects not only the outcome of an investigation, but also which types of manager petition for the public benefit, and the market circumstance in which they do so. For example, only high-quality managers in poor market conditions will petition for relief from competition in a SE. In a PE, both types will petition in each market environment. With the SSE both management qualities will petition, but only when market conditions are weak. The primary affect of politicizing the administered protection process is to preclude the SE.[19]

There are several empirical studies of unfair trade practices and safeguards cases that provide some casual evidence regarding the value of e^*. The evidence as to the value of relief from administered protection filings is mixed.[20] There appears to be some benefit, but the effect on such variables as common stock prices, profits and employment is not dramatic. This suggests that the value of e^* is not high, and that the politicized regime is in effect. There is no requirement for a high e^* if the authority is not expected to infer managerial quality. There are evidently enough firms with low-quality managers receiving protection, and not being able to take advantage of it, for the aggregate results of these studies not to provide compelling evidence of a benefit.

II. Conclusion

This paper provides a model of an injury investigation that can pertain to any public policy with eligibility criteria that include an injury test. It discloses that the thoroughness of that investigation is an important policy decision which is at the discretion of the government conducting this procedure. The thoroughness of the investigation is revealed to have important implications as to which firms petition for public benefits.

The paper distinguishes between firms by their managerial quality: high and low. It contends, based upon casual evidence, that low-quality managers attempt to obtain public benefits through political influence, so as to compensate for managerial deficiencies. (I recognize, of course, that this is not the only interpretation of the manifestation of politics in the investigation process. An alternative is to suppose that type-H managers are influential.) It also contends that public policy that protects firms from the consequences of competition exists to diffuse opposition to market liberalization. It additionally

supposes that economic agents that are harmed by such policies impose limits on its use by the government. The paper demonstrates, however, that those limits are likely to be rather weak, as the authority is, in practice, not likely to be able to infer managerial quality. Thus, the operational limit is most plausibly to preclude protection when market conditions are good.

The paper concludes that, because investigations are costly and the authority's information is incomplete, it may be optimal for the authority to make mistakes, granting (denying) the benefit when it would deny (grant) it with complete information. It also concludes that, because it does not have to send a costly signal to the authority, high-quality managers prefer a politicized investigation process. Note that this preference by high-quality managers for a politicized regime does not require an assumption that high-quality managers are also good at eliciting favours from the government. The paper provides an explanation for the apparent limited benefit of affirmative administered protection decisions, disclosed by empirical studies of petitioning firms. It contends that this is consistent with the authority choosing low levels of effort in its investigations, thereby granting the benefit to both high and low-quality managers. Because both types obtain the benefit, aggregate measures of the gain from competitive relief will be diffused by the protection of low-quality managers. Further, because firms may underperform to generate protection with certainty, an immediate benefit may not arise.

APPENDIX

The value of e^* is given by (10). Given e^*; $\tilde{b}^{i^*}$, $i = H, L$ solves (4), and satisfies (7) Let $\gamma^{H\underline{\alpha}} > \gamma^{L\underline{\alpha}} > \gamma^{H\overline{\alpha}} > \gamma^{L\overline{\alpha}}$. If $b^i > B_\alpha(e^*)$, then the authority infers that $\alpha = \overline{\alpha}$. If $b^i < B^\alpha(e^*)$, then the authority infers that $\alpha = \underline{\alpha}$.

Proposition 1 will hold if

(a) $\alpha = \underline{\alpha}$, $w^{H\underline{\alpha}} > w^{L\underline{\alpha}}$, $p(e^*;\, b^i)\gamma^{i\underline{\alpha}} \geqslant f$ and $p(e^*;\, b^i)\gamma^{i\overline{\alpha}} \geqslant f$ for $b^i = \sup B_\alpha(e^*)$, $p(e^*;\, b^H)\gamma^{H\underline{\alpha}} = f$, for $b^H \geqslant \inf B_\alpha(e^*)$.
(b) $\alpha = \underline{\alpha}$, $w^{H\underline{\alpha}} = w^{L\underline{\alpha}} > w^{H\overline{\alpha}} = w^{L\overline{\alpha}}$, $p(e^*;\, b^i)\gamma^{i\underline{\alpha}} < f \forall\, b^i < \inf B_\alpha(e^*)$.
(c) $\alpha = \overline{\alpha}$, $w^{H\underline{\alpha}} > w^{L\underline{\alpha}}$, $p(e^*;\, b^i)\gamma^{i\underline{\alpha}} < f \forall\, b^i < \inf B_\alpha(e^*)$
(d) $\alpha = \overline{\alpha}$, $w^{H\underline{\alpha}} = w^{L\underline{\alpha}} > w^{H\overline{\alpha}} = w^{L\overline{\alpha}}$, $p(e^*;\, b^i)\gamma^{i\underline{\alpha}} < f \forall\, b^i < \inf B_\alpha(e^*)$

Proposition 2 will hold if $\alpha = \underline{\alpha}$, $w^{H\underline{\alpha}} > w^{L\underline{\alpha}}$, $p(e^*;\, b^H)\gamma^{H\underline{\alpha}} > f$ for $\tilde{b}^{i^*} < b^H$, $p(e^*;\, b^H)\gamma^{L\underline{\alpha}} < f$ for $\tilde{b}^{H^*} < b^H$; and $b^H < \tilde{b}^{L^*}$ when $\alpha = \overline{\alpha}$, $p(e^*;\, b^H)\gamma^{i\overline{\alpha}} < f \forall\, \mathrm{i} = H, L$, $\tilde{b}^{i^*} > \sup B_\alpha(e^*)$ for $\alpha = \overline{\alpha}$.

Proposition 3 will hold if

(a) $\alpha = \underline{\alpha}$, $w^{H\underline{\alpha}} = w^{L\underline{\alpha}} > w^{H\overline{\alpha}} = w^{L\overline{\alpha}}$, $p(e^*;\, b^i)\gamma^{i\underline{\alpha}} > f \forall\, b^i < \inf B_\alpha(e^*)$, $p(e^*;\, b^i)\gamma^{i\overline{\alpha}} < f \forall\, b^i < \inf B_\alpha(e^*)$.
(b) $\alpha = \underline{\alpha}$, $w^{H\underline{\alpha}} > w^{L\underline{\alpha}} \geqslant w^{i\overline{\alpha}}$, $p(e^*;\, b^i)\gamma^{i\underline{\alpha}} > f \forall\, b^i < \inf B_\alpha(e^*)$, $p(e^*;\, b^i)\gamma^{i\overline{\alpha}} < f \forall\, b^i < \inf B_\alpha(e^*)$, and $\forall\, b^H < \tilde{b}^{L^*}$ when $\alpha = \overline{\alpha}$, $p(e^*;\, b^H)\gamma^{i\alpha} > f$ for $\tilde{b}^{L^*} < \tilde{b}^{H^*} \leqslant \sup B_\alpha(e^*)$.

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NOTES

1. In unfair international trade investigations, authors such as Herander and Pupp (1991), Moore (1992a), DeVault (1993), and Hansen and Prusa (1997) have provided empirical evidence of political influence upon US International Trade Commission (USITC) injury judgments. Rosendorff (1996) devised a theoretical explanation for voluntary export restraints (VERs) as an outcome of anti-dumping (AD) investigations, which is rooted in political influence.
2. There are several additional studies of the injury investigation in US trade policy, such as, Hartigan's (1995) discussion of the effect of the sequence of the existence of material injury and the existence of dumping decisions on the incentives to dump and to complain of dumping; Moore's (1992b) game between a legislature that controls the budget of an institution making administered protection decisions, and the institution's supply of protection that affects the legislature's popularity; Hartigan *et al.*'s (1989) empirical test of the stock market's reaction to material injury decision categories (actual injury v. threat of injury) in US AD cases; Staiger and Wolak's (1994) empirical test for outcome v. process filers in AD investigations; and Hansen and Prusa's (1996) study of cumulation in the USITC decisions.
3. Grossman (1986) and Pindyck and Rotemberg (1987) have devised empirical methods for distinguishing between foreign and home market sources of injury to a home industry in safeguards investigations. However, they did not model the investigation process itself.
4. Examples from international trade include Anderson (1992), Cassing (1994), Fischer and Mirman (1994), Gruenspecht (1988), Hartigan (1994, 1995, 1996a, b, 2000), Prusa (1992, 1994), Reitzes (1993), Staiger and Wolak (1992), and Webb (1992). These papers address the effect of unfair trade practices laws that adhere to the stipulations of the AD and anti-subsidy (AS) codes of the GATT/WTO on strategic market equilibria. They are not concerned with the optimal design of such laws.
5. A better mechanism, for example, might include requiring firms receiving negative verdicts to compensate the government for its costs in conducting the investigation. Kohler and Moore (2001) consider implicit contracts under safeguards to induce a firm to engage in the optimal level of effort to adjust to the pressure of imports when the government trades off political returns against adjustment costs and its information is incomplete.
6. The credible commitment can take several forms. One is the budget of the investigative agency. Another is the number of employees assigned to this task. The statutory length of the investigation and its complexity is still another indication of commitment. These are all visible to a potential petitioner.
7. In unfair international trade investigations, there must also be evidence, established in a parallel investigation, of an unfair act. However, this is almost always 'found'.
8. The USITC, for example, stipulates that information disclosed by firms in the investigation can be used for no other purpose than the establishment of injury in import damage investigations.
9. Examples include Bernanke and Gertler (1990), Brown *et al.* (1993), Myers and Majluf (1984), Flannery (1986), and John (1987).
10. Sah and Stiglitz (1991) allude to this.
11. With heterogeneous management, it would be easier to ascertain which firms are well managed and which are not. On the other hand, providing a remedy is more difficult. It will be of benefit to both qualities of management in an industry. Australia has observed that a successful appeal for administered relief is more likely when both the number of petitioners and the number of allegedly unfair traders is small. Thus, the assumption of a single petitioner may not be unreasonable.
12. In the context of international trade injury investigations, Prusa (1994) has demonstrated theoretically, and Steagall (1995) empirically, that a petitioning firm may manipulate variables under its control to appear injured and to increase the probability of an affirmative verdict.
13. It is assumed that the cost of filing for firms with high-quality managers is identical to that for firms with low-quality managers. It is conceivable, however, that when firms are politically influential they must incur a cost for obtaining this influence. This is not addressed in the present context. It is assumed that this cost is incurred outside of the investigative process, through influence on elected officials. These officials, through control of the authority's budget, may exert indirect influence.
14. In the present model, the authority is concerned with expected changes in firm profits as a result of a petition. In actuality, it may also be concerned with the level of firm profits. Because firms are likely to emphasize the expected change in profits when considering a petition, the authority's welfare function is also concerned with the change in profits to the enhance tractability of the model.

15. Many injury laws do not have a national interest (welfare) clause. Examples, include the unfair international trade laws of Australia and the USA.
16. A contrast is with Feenstra and Lewis (1991), in which the government may optimally choose the information it reveals to a foreign firm about the home firm through its decision. In the present paper, the government may not be able to become fully informed.
17. It is possible that the authority may place different weights on each strategy pair. It is most consistent with this position of the paper that $w^{L\underline{\alpha}}$ exceeds the weight placed upon $w^{H\overline{\alpha}}$ and $w^{L\overline{\alpha}}$ if different weights are assumed.
18. If $w^{H\overline{\alpha}} > w^{L\overline{\alpha}}$, it is possible that another SE could emerge when $\alpha = \overline{\alpha}$. This would require that type-H managers select a b^H in excess of the largest value in $B_\theta(e^*)$.
19. The issue of obfuscation in the investigative process detailed above has been raised by Magee *et al*. (1989) in the context of the political economy of trade policy.
20. Examples include Hartigan *et al*. (1986, 1989), Hansen and Prusa (1995), Hughes *et al*. (1997), Krupp and Pollard (1996), Rehbein and Starks (1995), and Staiger and Wolak (1994).

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