Strategic Lobbying

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1. Introduction

Dynamic interaction between political and economic markets is often described in informal accounts of the political economy of trade policy. For example, credible threats by interest groups (backed by commitment of resources) to seek protection or to file anti-dumping suits may deter sales of foreign firms. The idea is that when decisions occur in sequence, rent-seeking can involve strategic lobbying: pressure group actions taken to influence subsequent policy moves by the government or economic decisions by rival economic actors which trigger government policy moves.

This paper initiates the formal study of strategic lobbying in the model of domino dumping set out by Anderson (1992, 1993).\(^1\) Exporting firms dump to obtain implicit options on export licenses in anticipation of a Voluntary Export Restraint (VER). Anti-dumping law commits the government to an Anti-dumping Duty (ADD) or a VER according to given rules. The rent-seekers undertake at least two types of political activity: pressing for stricter enforcement of the rules, and lobbying for a VER. These actions by rent-seekers influence subsequent dumping activity by exporters, which then influences still later decisions in the political market made by the government and by the rent-seekers.

The focus of this paper is on the incentives of rent-seekers in the initial political market. This is important for two reasons. First, characterizing industries with the most to gain from enforcement is potentially useful in predicting their behavior in political markets. Interestingly, while it seems obvious that rent-seekers would always prefer vigorous anti-dumping enforcement, a condition is provided where this need not be so. Second, protectionist pressure is popularly supposed to be deflected by anti-dumping

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\(^1\)The first paper sets out the model of exporting firms and considers the optimal policy of the exporting country government. The second paper develops the pressure group political economy model and considers the optimal policy of a 'government' acting in the public interest.
enforcement. In the strategic model developed here, this need not be true, since lobbying investment can be increased by an exogenous increase in anti-dumping enforcement.

In the domino dumping model, exporting firms know there is some chance that in the future period the pressure group in the importing country will succeed in obtaining a VER. Future export licenses will be in proportion to current sales in the event of a VER, hence current sales secure an implicit option on export licenses in the event of a VER. This leads to current sales below current marginal cost: domino dumping.

The government policy of the importing country in the future period is determined in political equilibrium by a group of rent-seekers buying protection in a political market. The policy will be either a VER, an ADD or free trade. The ADD can be obtained for free if there has been an affirmative dumping and injury finding; otherwise it is infinitely costly. The VER will be purchased if the given lobbying cost is less than the rent gained by a VER relative to the alternative (an ADD or free trade). I assume that the lobbying cost lower if there has been an affirmative dumping and injury decision. The lobbying cost of obtaining the VER under each contingency is random in the present period, and all agents know the distribution of the cost. Based on the rationally forecast behavior of the rent-seekers in the future, the probabilities of a VER, an ADD and free trade are determined. Moreover, these probabilities depend on present trade volume, since the gain to a VER and the size of the ADD both depend on the current trade volume. The rent-seeking lobby in the importing country sees through the dependence of the probabilities on current trade volume. Moreover, the probabilities and current trade volume are dependent on the intensity of the current political lobbying effort. Thus rent-seekers in the current period can strategically affect both the level of current exports and through it the probability of subsequent government policies.

Rent-seekers have two instruments available. First, they can invest today for influence in the future by undertaking political advertising and making campaign contributions. Second, they can lobby for vigorous antidumping enforcement. Loosely,
the first type is associated with buying influence in the legislature and in the court of public opinion while the second type is associated with lobbying the executive. This paper offers some progress in modeling the first instrument, while the analysis of the second instrument is confined to characterizing the enforcement interest of the rent-seekers.

Like other investment, lobbying is ordinarily subject to 'adjustment cost', which offsets the incentive to defer the expenditures until the uncertainty about cost is resolved.\footnote{There is no discounting in the model, for simplicity. Discounting would increase the incentive to defer expenditures.} While the model here is extremely stylized, it conforms to casual empiricism about political contribution behavior, which often is described as investing in 'access' to key politicians.

The results show that strategic lobbying is not inevitable. Under a commitment to not enforce antidumping legislation, lobbying investment is reduced relative to its level with a small amount of enforcement. With no adjustment cost in lobbying, hence no 'investment' motive for initial lobbying, all lobbying in the initial political market would be eliminated. A finite probability of antidumping enforcement is thus necessary for strategic lobbying. As for rent-seekers' interest in antidumping enforcement, it is possible that rent-seekers will not gain, but conditions are given under which it would pay for rent-seekers to push for at least some antidumping enforcement. In other words, in at least some range of parameter values, lobbying investment and pressure for anti-dumping enforcement are complementary activities. These considerations may rationalize the observed behavior of rent-seekers who simultaneously push for vigorous antidumping enforcement and engage in lobbying investment leading to a VER.

The economic model is quite simple and the political features are stylized to capture the VER/antidumping environment of current trade policy in developed countries. Nevertheless, many of the features of the model should be more broadly instructive. Any
environment in which the government is partially committed to a rule opens up the window for strategic action by rent-seekers. The particular form of the rule and the interaction of the interest group with its rivals in economic and political equilibrium is of course subject to wide variation. A deeper political economy model should follow Grossman and Helpman (1992) in modeling the political equilibrium of rival interest groups. The economic model assumes competitive exporting firms and competitive domestic rivals for simplicity. Relaxation of this assumption to small numbers of firms active in the economic markets will make no difference to the essential features of the model. Allowing for foreign interest groups to be active in the political market is an important venue for future work, since affects both the VER level and its probability.

Section II sets out the basic model, reviewing Anderson (1993). Section III takes up the desirability of committing some lobbying expenditure for a VER in period 1 when the enforcement effort is fixed. Section IV considers the desirability of lobbying for antidumping enforcement when the level of lobbying investment is fixed. Section V considers the effect of variation in antidumping enforcement upon the 'public interest' and upon rent-seekers when the lobbying investment is chosen optimally. Section VI concludes.

II. The Basic Model

The model has 2 periods, each containing a political market and an economic market. The equilibrium of the political market is reached before that of the economic market in each period. The period 1 political market supplies a fixed enforcement effort at zero cost. The political market in period 2 may produce a VER, an ADD or free trade. At the end of the period 1 economic market, the enforcement mechanism determines

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3 This abstracts from the low cost of filing a suit which exists in practice.
whether injury by means of dumped imports has occurred. If injury has occurred, the period 2 political market can produce an ADD at zero cost. Alternatively, the supply side of the political market in period 2 offers a VER at a constant cost. The cost of the VER is random in period 1, and lower if injury is found than if injury is not found. By investing in lobbying in period 1, the rent-seekers lower the cost of the VER in the period 2 political market. Once the basic setup is complete, I analyze two forms of strategic lobbying. First, an investment in lobbying in period 1 has a commitment value to rent-seekers in subsequent games against the government and the foreign firms. Second, the rent-seekers' interest in antidumping enforcement is analyzed.

The table below summarizes the sequencing and the decisions taken.

<table>
<thead>
<tr>
<th></th>
<th>Period 1</th>
<th></th>
<th>Period 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Political</td>
<td>Economic</td>
<td>Political</td>
<td>Economic</td>
</tr>
<tr>
<td>Market</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>supply price or quantity fixed, characterize rent-seeker's interests</td>
<td>competitive exporters and buyers</td>
<td>rent-seekers buy policies at exogenous cost and buyers</td>
<td>competitive exporters s/t distortion</td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td>level of antidumping enforcement, level of lobbying investment</td>
<td>current export level</td>
<td>ADD, VER or free trade</td>
<td>future export level</td>
</tr>
</tbody>
</table>

In US trade law, an ADD requires that there be injury by means of dumped imports. The Commerce Department always finds that foreign firms have dumped, while the International Trade Commission often finds no injury.
• The economic market in period 2 will either have 'free trade', repeating period 1, an antidumping duty (ADD) based on the period 1 dumping margin, or a VER.

• The rent-seekers buy protection in the period 2 political market if the gain exceeds the cost. If injury is found, an ADD is available at no cost. A VER 'remedy' is also available at a fixed cost, random in period 1. If injury is not found, a VER is obtainable at a fixed cost higher than if injury is found. Rent-seekers' optimal decisions result in probabilities of a VER, an ADD and of free trade.

• The period 1 competitive economic market will clear based on anticipated outcomes of the period 2 political and economic markets.

• The rent-seekers optimally choose lobbying expenditure in the period 1 political market. Their interest in antidumping enforcement effort is analyzed.

The actions of rent-seekers in period 2 and their resulting effect on probabilities of policies are laid out in the decision tree below, reproduced from Anderson (1993)

Rent-seekers actions and period 1 probabilities.

```
Beginning of Period 2

no injury

1−β
VER
π

free trade

1−π

injury

β
VER
γ
ADD
1−γ
```

The formalization of the above outline of the model follows Anderson (1993) very closely, and is reproduced here for the reader's convenience. See Anderson (1993) for more details.
The market for the tradable good is competitive, with many foreign and domestic firms selling a perfectly substitutable good at increasing marginal cost (different for foreign and domestic firms). \(P\) is the domestic price, a function of domestic production \(Y\) plus imports \(Q\). The competitive equilibrium level of \(Y, Y^*(Q)\), is selected by domestic competitive firms such that \(P(Q+Y^*) = C_Y(Y^*)\). Here, and in the remainder of the paper, a subscript denotes differentiation.

The domestic industry has a specific factor (human capital) which receives the difference between the value of production, \(PY\), and the cost of production exclusive of payments above opportunity cost to the sector-specific factor, \(C(Y)\). The owners of the specific factor have overcome the free rider problem to form a lobby which maximizes rent with respect to political actions. The total rent to the specific factor in the domestic industry is:

\[
(2.1) \quad R(Q) = P(Q+Y^*(Q))Y^*(Q) - C(Y^*(Q)) .
\]

The marginal effect of a rise in \(Q\) upon the rent received is negative:

\[
(2.2) \quad R_Q = P_Q Y^* < 0,
\]

\(P(Q)\) denotes the reduced form dependence of demand price on \(Q\), hence \(P_Q\) is equal to \((1 + Y_Q^*)dP/d(Q+Y)\).

The rent-seekers will choose to obtain a VER in period 2 in the absence of an injury finding if the lobbying cost of obtaining it, \(k\), is less than the gain, \(R(\bar{Q}) - R(Q^1)\), where the superscript 1 denotes the period 1 export and the bar denotes the VER level of exports. With no intervention, the level of exports in period 2 is assumed to remain at its period 1 level. The cost of obtaining the VER in period 2 is a random variable in period 1. Specifically, \(k\) is drawn from a uniform distribution with support \([0, K]\). Then the probability of a political VER is equal to:\(^5\)

\(^5\)For \(Q^1\) greater than a critical value such that the right hand side of (2.3) exceeds one, \(\pi\) is not defined by (2.3) and is instead equal to one. The interesting case for analysis is where \(Q^1\) is less than the critical value, because for larger values of imports the VER is certain and can be assumed to already be imposed.
(2.3) \[ \pi(Q^1) = \frac{R(Q) - R(Q^1)}{K}. \]

Differentiating (2.3) and using (2.2):

\[ \pi_Q = -\frac{R_Q}{K} = -\frac{Y^1 P_Q}{K} > 0. \]

An injury finding presents the rent-seekers with a different opportunity. At no
cost they will receive an ADD. Alternatively they can lobby the legislature and the
executive for a VER.\(^6\) The VER will be more favorable to rent-seekers than the
antidumping duty (ADD)\(^7\), and they will purchase it if the gain is greater than the cost, 1.
In period 1, the lobbying cost is unknown, and distributed uniformly on the interval [0,L].
This lobbying occurs at a lower cost than in the absence of dumping based on public
sympathy for the 'dumpers'.\(^8\) Formally, the lower cost shows up as L<K.

Let Q\(^1\) be the equilibrium level of imports under the antidumping duty. The rent-
seekers will lobby for an antidumping VER if \(R(Q) - R(Q^1) \geq L.\)^\(9\) The probability of an
antidumping VER, given an affirmative injury finding, is then:

\[ (2.5) \quad \gamma = \frac{R(Q) - R(Q^1)}{L}. \]

Next, consider the unconditional probabilities of the three outcomes,
[VER, ADD, free trade]. The probability of a VER obtained via the political process is
equal to \((1-\beta)\pi\) while the antidumping process will yield a VER with probability \(\beta \gamma\). The
unconditional probability of a VER is:

\[ (2.6) \quad \pi' = (1-\beta)\pi + \beta \gamma. \]

The unconditional probability of an ADD is

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\(^6\)For imperfectly competitive product markets, the dominant form is 'private VERs' negotiated between
firms with government blessing in the form of antitrust exemptions. Part of the enforcement is that the
antidumping petitions are suspended. See Prusa (1992) and Staiger and Wolak (1992). The distinction
between 'government' VERs and 'private' VERs seems inessential for present purposes.

\(^7\)This follows from the domino dumping behavior of the exporting firms detailed at the end of this section.

\(^8\)The cost may also be lower because the exporting firms have a strong incentive to help lobby for a VER as opposed
to the alternative anti-dumping duty.

\(^9\)The VER level is assumed to be the same under the anti-dumping and political processes. This is an
inessential simplification.
(2.7) \[ \beta' = \beta(1-\gamma). \]

Finally, the unconditional probability of free trade is:

(2.8) \[ 1 - \pi' - \beta' = (1-\pi)(1-\beta). \]

(2.6)-(2.8) are obtained by accumulating the probabilities on the decision tree. Each of the probabilities \( \pi' \) and \( \beta' \) is a function of \( Q^1 \), and \( Q^t \). The latter however is also a function of \( Q^1 \).

\( Q^t \) is determined by profit maximizing exporters operating under a duty, the level of which depends on first period exports. With an antidumping duty, the level of the duty is assumed to be equal to

\[ t = M(Q^1) - P(Q^1). \]

\( M(.) \) is the foreign firms’ marginal cost.\(^{10}\) The market equilibrium level of export sales in the event of a duty is:

(2.9) \[ Q^t = \phi(Q^1) = \left\{ Q^t \mid P(Q^t) = M(Q^t) + M(Q^1) - P(Q^1) \right\}. \]

\[ \phi_Q = \frac{dQ^t}{dQ^1} = -\frac{P_Q(Q^1) - M_Q(Q^1)}{P_Q(Q^t) - M_Q(Q^1)}. \]

\( \phi_Q \) is less than zero: the greater is \( Q^1 \), the greater will be the antidumping duty, and hence the lower the tariff-ridden export \( Q^t \). In the linear case \( \phi_Q = -1 \).

Substituting (2.9) into (2.5), \( \gamma \) is written as a function of \( Q^1 \):

(2.10) \[ \gamma(Q^1) = \frac{R(Q) - R(\phi(Q^1))}{L}. \]

Using (2.2) the response of \( \gamma \) to \( Q^1 \) is

(2.11) \[ \gamma_Q = -R_Q\phi_Q/L = -P_Q\gamma_Q/Q/L < 0. \]

Exporting firms set \( Q^1 \) in equilibrium in order to maximize expected profits. The positive probability of a VER induces domino dumping in order to obtain options on export licenses in the event of a VER. The equilibrium condition for competitive firms is:

\(^{10}\)Fair market value' in US trade law is equal to either average cost or price in the foreign market. Using marginal cost serves to tie the duty more closely to the behavior of the exporting firm, as in Anderson (1992). The simplification is relatively harmless.
(2.12) \(- (P(Q^1) - M(Q^1)) = \lambda \pi'(P(\bar{Q}) - M(\bar{Q})) - \beta'M_Q(Q^1)\phi(Q^1).\)

Here, \(\lambda\) is the expected restriction ratio \(\bar{Q}/Q^1\). The left hand side is the dumping margin (which also sets the ADD level, t). The competitive firms take \(P, \lambda, \pi'\) and \(\beta'\) as given. In contrast, the antidumping duty \(t\) is firm-specific in US trade law, so the firms internalize the marginal effect of current sales upon the expected future duty paid. This shows up in the second term on the right hand side of (2.12). The first term on the right hand side of (2.12), denoted \(V'\), is easily seen to be the option value of current sales. The term in brackets, \(P(\bar{Q}) - M(\bar{Q})\), is the unit license rent, \(\pi'\) is the probability of obtaining a license, and \(\lambda\) is the rate of transformation of current sales into future claims to licenses in the event of a VER. With some chance of an antidumping duty, the second term incorporates the expected second period duty-raising effect of increased exports in the first period.

The equilibrium of the model is the solution values of \(\pi', \beta', \lambda\) and \(Q^1\) such that:

(2.12) \(- (P(Q^1) - M(Q^1)) = \lambda \pi'(P(\bar{Q}) - M(\bar{Q})) - \beta'M_Q(Q^1)\phi(Q^1)\)

(2.13) \(\pi' = (1-\beta)
\frac{R(\bar{Q}) - R(Q^1)}{K} + \beta\frac{R(\bar{Q}) - R(\phi(Q^1))}{L}\)

(2.14) \(\beta' = \beta \left( 1 - \frac{R(\bar{Q}) - R(\phi(Q^1))}{L} \right)\)

(2.15) \(\lambda = \frac{\bar{Q}}{Q^1} \).

In solving for equilibrium, (2.13)-(2.15) are substituted into (2.12). Dumping need not occur under all parameter values, but will occur with a finite probability of antidumping enforcement and can occur even with certain antidumping enforcement, due to the chance of receiving an antidumping VER.

III. Strategic Lobbying Investment

Rent-seekers see through the model of Sections I and II and act to influence its outcome favorably through two instruments. The first is through investment in lobbying
pressure for VERs, studied in this section. The second instrument is lobbying to increase antidumping enforcement effort, taken up in the next section.

Lobbying of the first type has two effects. At constant period one trade volume, the lobbying in period one reduces the lobbying cost which must be incurred in period two to obtain a VER, and hence raises the probability of a VER. With an investment motive for lobbying, a dollar in period one produces more than one dollar of cost reduction in period two. This gain may or may not be worth the cost of spending in advance on lobbying which for high realizations of the cost of political participation will not end in the purchase of a VER. More interestingly, a commitment of lobbying expenditure for a VER in period one raises the probability of a VER and thus raises the trade volume in period one. This channel opens up a strategic lobbying motive.

The sign of the strategic lobbying motive turns out to be ambiguous. Technically, the effect of a rise in period one trade volume (induced by the rise in the probability of a VER) on expected net rent is ambiguous. With weak antidumping enforcement, the loss in rent in period one from higher exports dominates. With finite antidumping enforcement and further conditions given below, net rent is raised by a rise in current exports.

**Expected Net Rent**

Expected gross rent in period 2 is equal to $\pi R(\overline{Q}) + \beta' R(Q^1) + (1-\pi'-\beta') R(Q^1)$. The net rent gain is obtained by deducting the expected cost of obtaining VERs. The expected cost of a political VER given the decision to obtain one is equal to $[R(\overline{Q}) - R(Q^1)]/2$, due to the uniform density function for lobbying costs. The conditional expected cost of an antidumping VER is similarly equal to $[R(\overline{Q}) - R(Q^1)]/2$. The unconditional expected lobbying costs from both sources is equal to $(1-\beta)\pi [R(\overline{Q}) - R(Q^1)]/2 + \beta\gamma [R(\overline{Q}) - R(Q^1)]/2$. In addition, rent in period 1 is altered by
the effect of enforcement on exports in period 1. The expected present value of net rent over the 2 periods is equal to: \(^{11}\)

\[
NR = \pi'(Q^1) \frac{R(\bar{Q}) - R(Q^1)}{2} + \beta(1 - \gamma(Q^1)/2) \left( R(\phi(Q^1)) - R(Q^1) \right) + 2R(Q^1).
\]

The decision of rent-seekers to pay for lobbying can be made either in period 1, prior to the determination of period 1 trade, or in period 2, after \(Q^1\) is known. A lobbying investment is interpreted as a payment in period 1 which reduces the residual lobbying cost of obtaining a VER in period 2. The nature of lobbying is assumed to be such that the impact of one dollar of reduced cost in period 2 can be obtained by spending less than one dollar in period 1. The marginal productivity of this investment is, as usual, diminishing. \(^{12}\)

The period 2 lobbying costs are random in period 1, with upper limit \(K\) for a political VER and \(L\) for an antidumping VER. To lower the period 2 cost by \(x\) requires an investment in period 1 lobbying equal to \(v(x)\). (I simplify here so that the cost reduction in period 2 is the same whether or not the exporters have been caught dumping.) The productivity of the investment is expressed in the restrictions on the cost function: \(v(0) = 0, v' < 1\) and \(v'' > 0\). Based on this structure, the limits of the VER probability distributions are:

\[
K = K_{\text{max}} - x
\]

\[
L = L_{\text{max}} - x.
\]

Here, \(K_{\text{max}}\) and \(L_{\text{max}}\) are parameters.

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\(^{11}\) NR is equal to expected gross rent in period 2, less expected unconditional lobbying cost, plus \(R(Q^1)\).

\(^{12}\) This description of the cost of lobbying seems roughly realistic as far as it goes. Campaign contributions early in a politician's career are more valuable to the politician, and if reputations matter this will translate into more influence per dollar spent if the dollar is spent early. Advertising is often observed to have a cumulative effect such that early expenditures raise the productivity of later expenditures.
This structure is merely a first attempt at a complex problem. The investment cost function \( v \) is a reduced form of a larger political economy structure. Moreover, in a more fully specified model, \( K \) and \( L \) would be explained by deeper variables, which might include lobbying investments along with the rent-seeking efforts of others, potential entry, elements of political structure (which ultimately are endogenous) and the like.

**Effect of Lobbying on Net Rent**

The effect of lobbying in the first period on expected net rent over two periods is composed of two parts. First, at constant trade volume there is an effect of lobbying investment on the probabilities of a VER and an ADD, at a cost of \( v' \). Second, there is an effect of the change in probabilities on the trade volume in period one, which in turn shifts expected net rent. These two effects may be associated with the 'investment motive' for lobbying and the 'strategic motive' for lobbying.

**Investment motive**

At constant trade volume, the effect of \( x \) upon net rent inclusive of investment cost is given by differentiating (3.1):

\[
\frac{\partial NR}{\partial x} \bigg|_{Q - v'} = (1-\beta) \left( \frac{\pi}{K} \frac{R(Q) - R(Q^1)}{2} + \beta \frac{\gamma}{L} \frac{R(Q) - R(Q^1)}{2} \right) - \beta \frac{\gamma}{L} \frac{R(Q^1) - R(Q^1)}{2} - v'
\]

\[
= (1-\beta) \frac{\pi^2}{2} + \beta \frac{\gamma^2}{2} - v'.
\]

Evidently, \( \partial NR/\partial x \big|_{Q} \) is strictly less than one with both \( \pi \) and \( \gamma \) less than one. This means that in the absence of either a strategic motive (an effect of \( x \) on \( Q \)) or adjustment cost (\( v' \equiv 1 \), lobbying occurs only in the second period. In this case, one dollar of lobbying investment in period one yields less than a one dollar return on expected net rents, due to the chance that some realizations of the political state in period 2 will result in no VER. With \( v'<1 \) it is possible for (3.2) to be positive at \( x = 0 \). If \( v'(0) \) is sufficiently small, then at constant \( Q^1 \) the investment motive always operates in the direction of some lobbying
expenditure. (Positive investment may still not occur, since the effect of \( x \) on volume \( Q^1 \) may sufficiently negatively affect net rent.)

**Strategic Motive**

The strategic motive for lobbying investment arises through the effect of \( x \) on \( Q^1 \), and its subsequent effects on the elements of NR. Where positive, the strategic motive will increase lobbying investment. Where negative, it will decrease such investment.

The effect of a rise in lobbying investment, which lowers \( K \) and \( L \) and thus raises the probability of a VER at constant volume, will raise the level of period one exports.

This arises due to domino dumping: the option value of current exports rises. Formally:

\[
\frac{\partial Q^1}{\partial x} = - \lambda \left( \frac{(P(Q) - M(Q))}{(\pi - (1-\beta)\frac{\beta}{K} + \frac{\beta}{L})} \right) + \frac{\beta}{L}MQQ^1 > 0.
\]

In (3.3) the denominator is equal to

\[P_Q - M_Q + \lambda(\pi_Q - \pi/Q)(P(Q) - M(Q)) - (MQ_QQ^1 + MQ(\phi_Q) + \beta_QQ^1 \cdot MQ^1\] It is negative under weak conditions (see Anderson (1993)). Rent-seekers see through to (3.3) and incorporate it in their political choice problem in period 1. Investment \( x \) will be selected to favorably influence \( Q^1 \).

The effect of a rise in \( Q^1 \) on expected net rent over two period is the final piece of the puzzle. Formally, by differentiating (3.1) with respect to \( Q^1 \):

\[
\frac{\partial NR}{\partial Q^1} = \frac{1}{2} \left( R(Q) - R(Q^1) \right) \cdot \frac{R(Q) - R(Q^1)}{2} - \beta Q^1 \frac{R(Q^1) - R(Q^1)}{2}
\]

\[
+ \left( 2 - \frac{\pi}{2} \right) R_Q + \beta(1 - \gamma/2) \left( R_Q^1 \phi_Q - R_Q \right).
\]

The first line on the right is the 'probability effect' of the change in \( Q^1 \). The first term is the normally positive effect of a higher probability of a VER. The second term is the positive effect of a higher probability of an ADD, using \( \beta_Q > 0 \). Thus expected net rent is increasing in \( Q^1 \) and hence \( x \) via the probability effect. The third term on the right hand side of (3.4) is the 'volume effect'. It is negative. The fourth term is the ADD effect, representing the impact of a rise in \( Q^1 \) on the rent gain of the ADD over free trade.
The ADD effect is positive. Using (2.3), (2.4), (2.10) and (2.11), equation (3.4) becomes:

\[
(3.4') \quad \frac{\partial NR}{\partial Q^1} = (1 + (1-\beta)(1-\pi))R_Q + \beta(1-\gamma)R_Q^1\phi_Q.
\]

The sign of (3.4') is ambiguous, so special cases must be analyzed. One case offers a positive strategic motive and the other a negative strategic motive.

**Proposition 1**

(a) With no antidumping enforcement, net rent falls when current exports rise.

(b) With finite antidumping enforcement, linearity and sufficiently small rates of increase of domestic and foreign marginal cost, net rent rises when current exports rise.

**Proof of (a):** At \( \beta = 0 \), the second term of (3.4') is equal to zero, while the first term is always negative. \( \parallel \)

**Proof of (b):**

With linearity, \( \phi_Q = -1 \) and (3.4') may be rewritten as

\[
(3.4'') \quad -P_Q Y^1 \left( \beta(1-\gamma) - (1+(1-\beta)(1-\pi)) \frac{Y_1^1}{Y_1} \right)
\]

\( Y_1 \geq Y^1 \), and \( P_Q < 0 \). (3.4'') may have either sign. For sufficiently small \( Y_1^1/Y^1 \), (3.4'') is positive. Low \( Y_1^1/Y^1 \) is achieved by lowering \( C_{YY} \) and \( M_Q \) parametrically. \( \parallel \)

Proposition 1(a) is significant, since it implies that lobbying is reduced if the government could commit to no antidumping enforcement. Even if the investment motive implies a positive investment in lobbying in the first period, a reduction in antidumping enforcement to zero will reduce the optimal amount of lobbying.

With finite enforcement effort, results are more ambiguous, but Proposition 1(b) shows that a positive strategic lobbying motive is possible in the presence of large crowding out effects. Note from the proof of Proposition 1(b) that a positive strategic

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\(^{13}\) The term ADD effect is slightly misplaced. \( \beta(1-\gamma) \) is the probability of an ADD, so the 4th term is equal to the expected marginal ADD gain less \( \beta\gamma/2 \) times the marginal ADD gain effect. The third and fourth terms of (2.4) can be rewritten as \( 2 - \pi(1-\beta)/2)R_Q - (\beta\gamma/2)R_Q^1\phi_Q + \beta(1-\gamma)[R_Q^1\phi_Q - R_Q] \). The third term is the expected marginal gain from an ADD. The second term is the marginal effect of a rise in \( Q \) on the expected net rent gain from an anti-dumping VER, which is negative.
lobbying effect must have an interior maximum, since expression (3.4") must turn
negative as \( \gamma \) rises toward one.

The influence of the value of \( \beta \) is apparent from taking Propositions 1(a) and 1(b)
together. Consider \( \beta = 1 \). If no dumping occurs, \( Y^1 \) is equal to \( Y^t \) and (3.4") is negative.
If dumping occurs (see Anderson (1993) for details), it is possible to meet 1(b) even at \( \beta \)
equal to one. But lowering \( \beta \) must lower the critical value of \( C_{YY} \) and \( M_Q \) which permits
meeting the condition of 1(b).

Even in the absence of an investment motive for lobbying, the strategic motive
could make such an investment optimal. This arises if \( v' \) is always equal to one. Pulling
together the results of Proposition 1 and equation (3.3), the question can be addressed.
This case of 'pure' strategic lobbying appears to be a rather esoteric possibility, and in two
special cases it can be ruled out.

**Proposition 2**

(a) **With no antidumping enforcement, pure strategic lobbying will not occur.**

(b) **With full antidumping enforcement and linearity, pure strategic lobbying will not occur.**

**Proof:**

(a) By Proposition 1(a), net rents fall with a rise in exports induced by a rise in \( x \). By
using (3.2) with \( v' = 1 \), the constant volume effect on full net rent is less than the cost.
Thus both the investment effect and the strategic effect are negative.

(b) At \( \beta = 1 \), by (3.2) and the proof of Proposition 1(b), a one dollar rise in \( x \) will change
net rent inclusive of the investment cost by

(i) \[ \gamma^2/2 - 1 + \left( (1-\gamma)R_Q^\phi_Q + R_Q \right) \frac{\partial Q^1}{\partial x}. \]

\( R_Q = P_Q Y^1 \) and \( R_Q^t = P_Q Y^t \) and with linearity \( \phi_Q = -1 \). Equation (i) can be written as
\[
\frac{\gamma^2}{2} - 1 + \left( 1 - \gamma \frac{Y^1}{\dot{Y}^1} \right) \left( -PQY^1 \frac{\partial Q^1}{\partial x} \right)
\]

Using (3.3) it can be shown that with linearity

\[
0 < -PQY^1 \frac{\partial Q}{\partial x} < 1. \quad 14
\]

Even if \(-PQY^1 \frac{\partial Q^1}{\partial x} = 1\) and \(Y^1/\dot{Y}^1 = 0\), driving for the largest possible value of the expression (i), it reduces to \(\gamma^2/2 - 1 + (1-\gamma) = \gamma(\gamma/2 - 1) < 0.11\)

Finally, consider the optimal lobbying investment. Even with \(v'(0)\) small, the optimal investment may be zero as the investment motive is outweighed by a negative strategic motive. With a positive strategic motive, however, a small value of \(v'(0)\) guarantees some lobbying investment will be optimal. Moreover at some point the productivity of the investment must fall to zero as the VER becomes certain. Thus the optimal value is bounded. Based on preceding structure, the uniqueness of a local optimum cannot be guaranteed but it is harmless to assume it.

Defining full net rent FNR as NR-v, the optimal interior lobbying investment is characterized by

\[
(3.5) \quad \frac{\partial \text{FNR}}{\partial x} = (1-\beta) \frac{\pi^2}{2} + \beta \frac{\gamma^2}{2} - v' + \frac{\partial \text{NR}}{\partial Q} \frac{\partial Q^1}{\partial x} = 0.
\]

The assumed second order condition is \(\partial^2 \text{FNR}/\partial x^2 < 0\). Substituting (3.3) and (3.4') into (3.5) yields an equation which implicitly characterizes the optimal lobbying investment.

---

14This follows because at \(\beta=1\), \(\pi' = \gamma\) and using (2.11) for \(\gamma_Q\) and \(\phi_Q = -1\), the denominator of (3.3) reduces to

\[
PQ - \gamma M_Q - \lambda(\gamma Q) \left( P(\tilde{Q}) - M(\tilde{Q}) \right) + \lambda \left( P(\tilde{Q}) - M(\tilde{Q}) \right) \frac{PQY^1}{L} + MQQ \frac{PQY^1}{L}.
\]

The product of the last two terms together and \(\gamma\) is equal to minus the numerator of (3.3) times \(-PQY^1\). The first three terms of the denominator expression above are all negative, hence \(-PQY^1 \frac{\partial Q}{\partial x} < 1\).
IV. Anti-dumping Enforcement and Rents

Anti-dumping enforcement affects the level of exports and offers another avenue for strategic lobbying. It seems obvious that rent-seekers would prefer more enforcement: i.e., expected rent rises with enforcement effort from $\beta=0$ to $\beta=1$. Instead, it is possible for rent to fall with enforcement. One example of each direction of change is provided. To facilitate the analysis, lobbying investment $x$ is exogenously fixed and may as well be assumed to be equal to zero.

Repeating the steps of the preceding section, the expected present value of net rent over the 2 periods is equal to:

\[ NT = \pi(Q^1)\frac{R(\bar{Q}) - R(Q^1)}{2} + \beta(1 - \gamma(Q^1)/2) \left( R(\phi(Q^1)) - R(\bar{Q}) \right) + 2R(Q^1). \]

The effect of a rise in the enforcement probability on the expected net rent is obtained by differentiating (4.1) with respect to $\beta$ and using the comparative static derivatives of Section II. Evaluating at $\beta$ equal to zero:

\[ \frac{dNT}{d\beta} \bigg|_{\beta=0} = \frac{1}{2}[R(\bar{Q}) - R(Q^1)]\pi_Q \frac{\partial Q^1}{\partial \beta} + \frac{\gamma - \pi}{2}[R(\bar{Q}) - R(Q^1)] + (1 - \gamma/2)[R(Q^1) - R(Q^1)]. \]

Note that $[R(\bar{Q}) - R(Q^1)]\pi_Q = -\pi Q$, from (2.2) and (2.4). Substituting into (4.2),

\[ \frac{dNT}{d\beta} \bigg|_{\beta=0} = (2 - \pi)R_Q \frac{\partial Q^1}{\partial \beta} + \frac{\gamma - \pi}{2}[R(\bar{Q}) - R(Q^1)] + (1 - \gamma/2)[R(Q^1) - R(Q^1)]. \]

The first term is the strategic effect of the antidumping enforcement, and depends on the sign of $\partial Q^1/\partial \beta$. From Anderson (1992), $\partial Q^1/\partial \beta < 0$ has the sign of

\[ \lambda(\gamma - \pi)(\bar{P} - M(\bar{Q})) - (1 - \gamma)\pi Q(Q^1)Q^1. \]

The 'normal' case is $\partial Q^1/\partial \beta < 0$. The last two terms represent the net effect of shifting probability mass at constant trade volume among the alternatives of free trade, a VER and an ADD. The third term is always positive while the second term has the sign of $\gamma - \pi$. 

Two special cases can be developed, to illustrate that either sign is possible. Let $A(Y)$ be the average cost of domestic production of $Y$.

**Proposition 3**

(a) If $\gamma = \pi$, a small amount of enforcement increases expected net rent.

(b) If $\gamma > 0$, $\pi = 0$ and $M_Q$ is small, a small amount of enforcement reduces expected net rent provided $\frac{\bar{Q}}{\bar{Y}} \geq \frac{1}{4} \frac{Q^1}{Y^1}$ and $A(\bar{Y}) \geq 4\lambda \bar{M}$.

**Proof of Proposition 3:**

(a) Under the condition, exports respond normally, the middle term is zero and the last term is positive.

(b) At $\pi = \beta = 0$, $\pi' = 0$ and there is initially no dumping. Therefore $Q^1 = Q^1$, and the third term of (4.2') vanishes. The right hand side of (4.2') reduces to

(i) $2R_Q \frac{\partial Q^1}{\partial \beta} + \frac{\gamma}{2} [R(\bar{Q}) - R(Q^1)]$.

Under the conditions given and with $M_Q$ vanishingly small,

(ii) $\frac{\partial Q^1}{\partial \beta} = \frac{\lambda \gamma (\bar{P} - \bar{M})}{-P_Q}$

Substituting $P_Q Y^1$ for $R_Q$ in (ii) and substituting the result into (i), (4.2') may be written as

$$\frac{Y^1}{2} \left( -4\lambda (\bar{P} - \bar{M}) + \frac{Y}{Y^1} (\bar{P} - \bar{A}) - (P^1 - A^1) \right)$$

Using $\lambda$ equal to $\bar{Q}/Q^1$, the conditions of Proposition 1(b) are over-sufficient for the bracketed expression to be negative.!!

Note that exports respond perversely to enforcement under the assumptions of Proposition 3(b), using expression (4.3). The implication of Proposition 3(b) is that rent-seekers lose from initiating the possibility of an antidumping VER when: (1) the VER is not too stringent (the ratio of import to domestic market shares under the VER exceeds 1/4 its value before the VER), and (2) the domestic industry's costs are high relative to the
costs of the exporters. The VER stringency condition is not restrictive, being met by VERs in practice for the US at least. In contrast, the relative cost condition is quite restrictive. Both conditions are intuitive.
V. Anti-dumping and Lobbying

Popular concern over the influence of lobbyists suggests that reform which reduces it has some political appeal. In the context of domino dumping, a reform which might reduce lobbying expenditure is to reduce the level of antidumping enforcement. The main practical conclusion to be drawn from Section III is that a credible 'government' commitment to no antidumping enforcement (in practice by changing the antidumping laws) is potentially quite productive in deterring strategic lobbying expenditure. Can a decrease in the probability of antidumping enforcement decrease lobbying expenditure throughout its range? Is this desirable? This section provides an initial investigation, both theoretically and in a simulation model. The simulation model also provides a welfare analysis of antidumping commitment.

It is plausible that rent-seekers' interest and the 'public interest' are opposed in antidumping enforcement. (The traditional 'public interest' model of government is at least partially relevant when voter behavior depends in part on their reaction to the influence of lobbyists and on perceptions of general prosperity. See Grossman and Helpman (1992) for more discussion.) Section IV shows, however, that the conditions for rent-seekers to prefer antidumping enforcement are rather delicate. Similarly, Anderson (1993) shows that conditions for a 'public interest' government to prefer no antidumping are rather delicate. This section takes up the same two issues when the level of lobbying investment is endogenous. The added complexity does not permit firm conclusions, so an exploratory simulation is presented.

Theoretical Analysis

Using the method of comparative statics, the effect of a change in $\beta$ on the optimal level of investment at an interior solution may be signed by differentiating equation (3.5). $\partial x / \partial \beta$ will have the sign of

$$
(5.1) \quad \frac{\partial (\partial FNR/\partial x)}{\partial \beta} = \left( \frac{\gamma^2}{2} - \frac{\pi^2}{2} \right) + \frac{\partial Q^1}{\partial x} \frac{\partial (\partial NR/\partial Q^1)}{\partial \beta} + \frac{\partial NR}{\partial Q^1} \frac{\partial (\partial Q^1/\partial x)}{\partial \beta}.
$$
The first term is the pure investment effect of a rise in \( \beta \), at constant foreign sales. It is positive for \( \gamma > \pi \). The next two terms give the strategic lobbying effect of a rise in \( \beta \). The middle term can be shown to be positive. The sign of the third term is ambiguous in both elements of the product. (Proposition 1 gives conditions which sign \( \partial NR / \partial Q \).) The case where \( \partial x / \partial \beta \) is positive might perhaps be the 'normal' case, since there is a presumption in favor of it. But, while intuitive, it need not be true that investment rises with anti-dumping enforcement.

The response of welfare to a rise in the probability of an injury finding \( \beta \) at constant lobbying effort is given in Anderson (1993). As usual with second best problems, a rise in \( \beta \) can either raise or lower welfare. In the present model there is the added complication of the effect of a rise in lobbying effort on welfare (counting the lobbying expenditure as social loss, using real resources). It seems intuitive that a reduction in lobbying would be socially useful, but again there are second best complications. The analytic expression for the full effect of a rise in \( \beta \) on welfare in this model is not very illuminating. Thus I turn to simulation.

**Simulation Analysis**

Simulation gives some insight into the response of lobbying to \( \beta \), as well as the resulting welfare analysis. The results given below are based on the following parameter values in a constant elasticity simulation model. The demand elasticity is 1.1. The foreign marginal cost elasticity is equal to 1.2. Three parameters are varied to explore characteristics of the model. The home marginal cost elasticity is equal to 0.8 or 0.5, while the demand location parameter varies by a factor of 10. The VER is altered when these parameters change to maintain a relevant range of the equilibrium. The VER is aimed at cutting base (no enforcement) trade about in half.

The lobbying cost parameters are such that \( \gamma \) is greater than \( \pi \) in the relevant range of exports. This makes the first (non-strategic) term in expression (5.1) positive, so that lobbying investment tends to rise with \( \beta \) at an interior solution. Finally, lobbying
investment is very efficient, such that a penny spent today saves a dollar tomorrow (\(v'\) is equal to 0.01).

The main conclusion to be drawn from simulations thus far is that strategic lobbying occurs for rather special parameter values. When it does not occur, net rent rises and welfare falls continuously with \(\beta\), but the efficiency loss is modest, amounting to around 1/2 of one percent in initial surplus in going from \(\beta=0\) to \(\beta=1\).

The first set of simulations show a case where lobbying investment occurs only when the strategic motive is absent, due to the disappearance of dumping. Here the demand location parameter is at its high level, and the domestic marginal cost elasticity is equal to 0.5. Foreign sales take up about 1/4 of the market. The VER contracts the level of sales by alternately to 55% and 80% of base sales (associated with no enforcement effort). Domestic sales refers to first period sales, lobby cost means the first period investment in lobbying, and add% refers to the ad valorem rate of antidumping duty (also equal to the dumping margin).

\underline{Table 1. Lobbying Investment and Enforcement: Nonstrategic Cases}

<table>
<thead>
<tr>
<th>beta</th>
<th>welfare</th>
<th>net rent</th>
<th>inv</th>
<th>domestic sales</th>
<th>pi</th>
<th>gamma</th>
<th>add percent</th>
</tr>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>VER contraction = 55%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>0.000</td>
<td>29895.902</td>
<td>788.133</td>
<td>0.000</td>
<td>84.419</td>
<td>0.500</td>
<td>0.588</td>
<td>0.118</td>
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<tr>
<td>0.200</td>
<td>29876.661</td>
<td>798.027</td>
<td>0.000</td>
<td>85.125</td>
<td>0.451</td>
<td>0.692</td>
<td>0.064</td>
</tr>
<tr>
<td>0.500</td>
<td>29859.589</td>
<td>805.395</td>
<td>0.000</td>
<td>85.590</td>
<td>0.419</td>
<td>0.758</td>
<td>0.025</td>
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<tr>
<td>0.750</td>
<td>29849.701</td>
<td>809.107</td>
<td>0.000</td>
<td>85.785</td>
<td>0.405</td>
<td>0.785</td>
<td>0.008</td>
</tr>
<tr>
<td>1.000</td>
<td>29842.380</td>
<td>811.845</td>
<td>0.004</td>
<td>85.876</td>
<td>0.401</td>
<td>0.804</td>
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<td></td>
<td>VER contraction = 80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>29884.299</td>
<td>792.076</td>
<td>0.000</td>
<td>85.442</td>
<td>0.214</td>
<td>0.308</td>
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<tr>
<td>0.100</td>
<td>29871.382</td>
<td>797.671</td>
<td>0.000</td>
<td>85.876</td>
<td>0.184</td>
<td>0.369</td>
<td>0.000</td>
</tr>
<tr>
<td>0.100</td>
<td>29870.074</td>
<td>798.038</td>
<td>0.187</td>
<td>85.876</td>
<td>0.227</td>
<td>0.589</td>
<td>0.000</td>
</tr>
<tr>
<td>0.200</td>
<td>29866.529</td>
<td>798.711</td>
<td>0.248</td>
<td>85.876</td>
<td>0.245</td>
<td>0.732</td>
<td>0.000</td>
</tr>
</tbody>
</table>

In Table 1, dumping disappears when the 'add percent' is equal to zero. At this point, foreign sales are insensitive to enforcement effort. Nevertheless, firms can still be caught dumping, with resulting VERs. For the parameters shown, it pays to invest in lobbying due to the pure investment motive. Formally, the right hand side of equation (3.2) is
positive, indicating a rise in investment will increase net rent. The lower panel of Table 1, with a milder VER restriction, shows that this occurs in the interval where enforcement effort is very small. The second row of the lower panel constrains lobbying investment to zero, in order to show the gain to optimal investment of 0.187 in the third row. The fourth row shows that investment rises with $\beta$ at an interior solution. (The first term of expression (5.1) is positive.) Welfare falls with increases in $\beta$, and as investment is made by rent-seekers.

It need not always be true that full enforcement effort ($\beta$ equal to one) will eliminate dumping. In this case a positive lobbying investment may not be made when the strategic motives negative, as it is in the simulations above. Results of this kind were obtained for the high demand model paired with a domestic marginal cost elasticity equal to 0.8.

Strategic lobbying, when it occurs, has an interesting structure. Table 2 demonstrates such a case. Here the demand function is at the low demand state and the domestic marginal cost elasticity is equal to 0.8. Exporters have about 70% of the market in the no enforcement base case. The VER cuts the foreign sales about in half relative to the no enforcement base level of sales. The first line of the table benchmarks the model at no enforcement, where the unique global optimum investment is equal to zero. The next two lines show two local optima in lobbying expenditure when $\beta$ is equal to 0.10. (The numerical analysis shows that these are the only two optima.) The first line retains lobbying at zero, and the second employs enough lobbying expenditure that the VER probabilities are driven to one. The result demonstrates that shifting to some enforcement effort can indeed trigger strategic lobbying.
There are two interesting implications of these results. First, the presence of multiple optima suggests that political economic equilibrium may leap from a low level of political involvement to a high level in response to a small change in some parameter. This seems plausible based on casual empiricism.

Second, the lobbying activity not only raises net rent, it raises welfare. Anderson (1993) analyzes the second best structure of government enforcement policy (β). Enforcement can, somewhat perversely, be welfare increasing. The results here imply that parametric increases in the probability of a VER can paradoxically be welfare increasing. The reason is that at β equal to 0.1, the increase in lobbying investment creates a large increase in the first period subsidy to trade (from 4.7% to 27.4%). The resulting gain in first period surplus is sufficient to offset the expected period 2 loss due to the increased probability of a VER.

At least one cautionary note should be entered here. The welfare measure assumes that shift in period two lobbying cost is accomplished by a social as well as private expenditure of .686. The 'adjustment cost' parameter implies a very high productivity of early campaign contributions, but the rationale may ascribe too much realism to the structure. Moreover, some portion of the assumed saved private costs of the political activity in period two is likely to remain as social cost not saved by the private lobbying investment. More progress can perhaps be made by opening the black box of lobbying cost.
Given the above structure, there is still a lot to learn about its properties through more exploration with simulation, preferably based on models constrained to fit actual markets.
VI. Conclusion

This paper has explored a model of the strategic lobbying incentives of rent-seekers. When activities occur in sequence, actors who are not 'small' have a strategic component to their decision making. In political economy this sets up interesting interactions between political and economic markets. Anti-dumping policy is a particularly rich and important example of this strategic interplay.

It is obvious that governments can play strategically at anti-dumping enforcement policy, but it is also important to realize that rent-seekers will play strategically at lobbying. Anti-dumping legislation is sometimes defended as a pressure valve which reduces more illiberal forms of protectionist pressure. In the domino dumping model this is often not true as firms follow up affirmative decisions on dumping with pressure for VERs. The contribution of this paper is to show that anti-dumping legislation opens a channel for strategic lobbying in which lobbying commitments have favorable effects on the decisions of foreign firms. Thus a 'de-politicizing' institution is perversely responsible for politicizing trade policy all the more.

The theoretical analysis reveals a rather convoluted second best structure in which 'intuitive' and 'counter-intuitive' results can be produced for the interest of the firm and the 'public interest' (see Anderson (1993)).

Simulation is required to produce a presumption about the effect of anti-dumping policy in practice. This awaits future work based on the structure of actual markets. The preliminary simulation results reported here show that enforcement of anti-dumping legislation can induce a strategic commitment to lobbying which improves both the position of the firm and the expected social surplus.
References


