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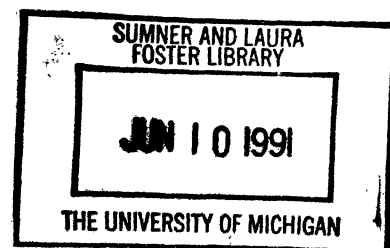# Inter-Industry Linkages and Cascading Contingent Protection

by

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I. Introduction

Since the mid-1970s a number of countries have resorted to import restrictions through instruments such as voluntary export restraint agreements (VERs), which violate the spirit, if not the letter, of the rules of the General Agreement on Tariffs and Trade (GATT). Increasing use has also been made of trade-restricting instruments that are "GATT legal," the major example being antidumping (AD) measures. Both AD and VERs are instruments of "contingent" protection, in that certain necessary conditions need to be satisfied before either can be invoked.[1]

Understanding firm behaviour in import-competing sectors under the prospect of protection requires careful attention to the nature of the incentives set up by these alternative instruments of contingent protection. The prospect of contingent protection can alter firm behaviour in a number of ways. That it may induce rent seeking behaviour is now well known.[2] Thus lobbying for protection is an unwelcome but anticipated by-product of policies that offer the prospect of protection. In addition, threats of VERs or AD are likely to influence the production and allocation decisions of both potentially affected exporting firms abroad and intervention-seeking import-competing firms at home.[3] The substitution possibilities between instruments of contingent protection for a *given* import-competing industry establishes a "horizontal" link between these instruments. Thus the initiation of AD is at times part of a strategy designed to induce foreign competitors to agree to a VER, or to pressure the home government into negotiating bilateral quantitative

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[1] A firm engages in dumping if the export price for its product is below the price charged on the home market. If dumping can be shown to injure domestic import-competing firms an antidumping duty equal to the dumping margin may be levied. AD and other instruments of contingent trade policy are discussed further in Section II below.

[2] See Tullock (1967) and Krueger (1974).

[3] Analyses of the impact of threats of contingent protection on exporting firms include Feenstra (1988), Stockhausen (1988), Hoekman and Leidy (1989) and Leidy and Hoekman (1990). Papers focusing on the incentive effects of such instruments on the behaviour of import-competing firms include Hillman, Katz and Rosenberg (1987), Messerlin (1989b), Leidy and Hoekman (1989), and Staiger and Wolak (1989).

restrictions with exporting nations.[4]

This paper extends the literature on the incentive effects of contingent protection by identifying and analyzing the *vertical* linkages that may exist across instances of contingent trade policy. That is, to what extent does it matter that there may be import-competing sectors at various stages along the production stream, and that at each stage firms have potential access to an array of instruments of contingent protection? In this connection two paradoxes arise. First, upstream firms sometimes seek protection which stands to severely injure, and perhaps destroy, their downstream customers. Second, there have been examples of unaffiliated downstream firms (customers) supporting, rather than opposing, such bids for potentially destructive protection.[5] The analysis of this paper rationalizes such behaviour. It is shown that the accessibility of VERs (or other forms of contingent protection) in a downstream industry may induce upstream suppliers of intermediate inputs to pursue AD even when it appears directly unprofitable to do so. In general, access to instruments of contingent protection at more than one stage of the production stream enhances the opportunity for components producers to engage in "indirect rent seeking."[6] This, in turn, increases the probability that *each* of the import-competing sectors along the production stream will eventually win some form of relief from foreign competition.

By initiating and winning an AD action, upstream suppliers can manipulate the health of downstream firms. Because establishment of injury is the principal criterion that

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[4]Many AD cases in the EC end with bilateral price or quantity agreements, while a large percentage of initiated AD complaints in the U.S. are withdrawn before a final determination, often due to agreement on a VER being reached (Messerlin, 1989a; Finger and Murray, 1990).

[5]See Destler and Odell (1987), p.46.

[6]As discussed in Leidy and Hoekman (1989), indirect rent-seeking involves attempts to manipulate the criteria established for gaining protection in order to enhance the probability of winning protection in the future. Often this takes the form of firms adjusting their decision variables so as to move closer to the point at which an injury investigation will end in a favourable ruling.

must be met before protection is granted, and since the probability of protection tends to increase with the extent of injury, access to contingent protection upstream can help create the conditions in which protection will be made available downstream. Because of this, instances of contingent protection tend to cascade down the production stream.

The plan of the paper is as follows. We begin in Section II with a brief discussion of alternative instruments of contingent protection and present a number of "stylized facts" which emerge from an examination of specific instances of intervention seeking. In Section III a simple model is developed in which an AD action by potential component producers severely injures firms in a downstream industry. In Section IV a theory of the vertical linkages across instances of contingent protection is developed that helps to explain the tendency of contingent protection to cascade down the production stream. It is shown that the pursuit of protection upstream can be rationalized as part of a strategy of indirect rent seeking, even if the immediate effect is to bring on the near destruction of downstream customers. Section V discusses some of the implications for the timing of anti-protectionist activity on the part of downstream firms. Concluding remarks are in Section VI. It should be noted that while the focus throughout is stimulated by U.S. trade law and experience, the analysis is quite general.

II. Contingent Protection and Intermediates: Stylized Facts

The instruments of protection that are potentially available to import-competing firms include antidumping and countervailing duties, emergency protection or safeguard actions, market sharing arrangements such as VERs, and domestic price support schemes (including subsidies). GATT rules require contracting parties to satisfy certain conditions before they may act against dumped imports. Thus, before AD duties can be imposed it must be demonstrated that: (1) imports are being dumped, i.e., the export price is below the price charged by the exporter in its home market for the same product; and (2) that this "materially" injures import-competing firms or threatens to. Article XIX of the GATT allows members to impose emergency protection in cases where imports are seriously

injuring domestic import-competing firms. In contrast to AD, emergency protection must be nondiscriminatory (applied to imports from *all* countries).

VERs have developed into the major substitute for Article XIX-type safeguard actions, largely because this allows countries to circumvent the nondiscrimination requirement. While AD and safeguard actions are usually authorized by the domestic legislation which implements GATT agreements, no formal rules exist for VERs.[7] In practice, however, petitioning firms will have to demonstrate import-related injury if they are to have a significant probability of obtaining VER protection. VERs, price support schemes, and subsidies will usually be the outcome of direct lobbying by the interested industry. In contrast, AD is a "low level" or "technical" track procedure where political influence plays at most a minor role in obtaining protection (Finger, Hall, and Nelson, 1982). If the requirements listed in the implementing legislation are met, intervention will follow.[8]

Over 400 AD cases have been initiated in the U.S. alone during the 1980s. Many of these pertain to intermediate goods, i.e., products that are used by industries in the production of other goods. It appears obvious that, if imports of intermediates are restricted, user industries will suffer as component prices rise. This in turn may lead affected user industries to seek protection of some kind. Indeed, the conferred injury may now *qualify* the user industries to receive protection. The U.S. experience illustrates that such "cascading" may well be a common phenomenon. Depending on the linkages between industries cascading may occur gradually or virtually instantaneously.

Textiles and apparel provide a good example of the latter possibility.[9] The United States cotton textile industry began actively to seek import protection during the latter half

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[7]In the U.S. context Article XIX-type safeguard actions are known as escape clause or Section 201 actions, after the relevant part of the implementing trade legislation.

[8]For a more extensive discussion of existing trade "remedies," see Jackson (1989).

[9]What follows draws on Aggarwal (1985), Giesse and Lewin (1987), and Hufbauer, Berliner, and Elliot (1986).

of 1954, and succeeded in getting Japanese producers to agree in December 1955 to restrain the export of semi-finished cotton fabrics, especially velveteen and gingham. Subsequent to the 1955 initiation by the velveteen industry of a Section 201 safeguard investigation, the investigating authority announced in October 1956 that velveteen producers were being injured by imports, thus opening the way for a significant increase in tariffs. The gingham industry submitted an analogous application for import relief two months after this positive injury finding.

The threat of such contingent protection helped induce Japanese producers to agree in January 1957 to a five-year restriction on cotton textiles *and* apparel. It is noteworthy that this agreement was not restricted to cotton fabric but also covered woven apparel and knit goods, i.e., the end products or final goods. What emerged was a coalition of U.S. producers of intermediate inputs (yarns, gingham, velveteen) and final good producers (apparel, clothing) that managed to cooperate successfully during the next 35 years in ensuring continued restrictions on access to the U.S. market. It can be speculated that the credible threat of gingham and velveteen producers to further increase import tariffs on their products made it both more attractive and necessary for apparel producers to ensure that their products would also be subject to additional import restrictions. In the case of textiles it appears that producers of intermediates and final goods very quickly saw the benefits of cooperating, perhaps in part because the upstream/downstream linkages are very tight in this sector. Thus, instead of observing a gradual cascading of protection across sub-sectors, the entire industry was protected almost from the outset. However, it is important to note that the initial trigger came from producers of intermediates.

Steel provides an example where pressures for protection by upstream firms has had a more gradual cascading effect. The postwar history of steel protectionism began with the January 1969 agreements by the European Community, Japan and the United Kingdom to restrict their exports to the U.S.[10] The VERs affected only semi-finished

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[10]The U.K. became subject to a VER as of January 1972. For a history and analysis of

carbon and alloy steels, such as ingots, slabs, and sheet bars, and were negotiated under threat of legislation limiting such steel imports to 9.6 per cent of the U.S. market.[11] The VERs expired at the end of 1974. Protectionist pressures re-emerged during 1977, this time largely in the form of AD petitions. So as to avoid a spate of AD investigations/ actions, an import relief plan was designed: the so-called Trigger Price Mechanism (TPM). The TPM set reference "normal value" prices for steel products. If imports were priced below the TPM prices, they would be subject to "fast-track" AD actions. The TPM did not succeed in restricting market access sufficiently to satisfy the U.S. industry. It filed a large number of AD petitions in March 1980, with the result that trigger prices were increased by about 12%. After November 1982, the TPM was replaced by a comprehensive system of bilateral quota agreements, largely as the result of the submission of over 100 unfair-trade petitions earlier in the year by major U.S. steel producers. This quota system was extended through the 1980s, subsequent to a Presidential decision in 1984 to negotiate 5-year "surge control" arrangements with all major suppliers.

Throughout the period starting in 1969, the steel products for which protection was obtained were semi-finished ones such as ingots, slabs, bars and wire. The resulting increase in the U.S. prices presumably had a negative impact on industries using these products relatively intensively. Such industries include producers of steel springs, metal cans, fasteners (nuts and bolts), railroad equipment, motor vehicle parts, and bearings.[12] One may therefore predict that, all other things equal, the probability that these user industries would at some point seek protection from imports is higher than for other industries. And, in practice, many of these industries have sought protection, some of

U.S. steel protectionism, see Jones (1986).

[11]Hufbauer, Berliner and Elliot (1986), p. 154. This and the following paragraph draw heavily on this source.

[12]Destler and Odell (1987, p. 192) note that the U.S. input-output table indicates that these are among the most "steel intensive" user industries.

them successfully. The ball bearing industry sought and obtained protection as a result of a Section 201 escape clause petition during the second half of the 1970s. Industrial fasteners were also given relief at the end of the 1970s as a result of an affirmative injury finding in an escape clause case. Producers of railroad equipment initiated antidumping and countervailing duty cases during the early 1980s, while the motor vehicle industry obtained relief from imports after the initiation of a Section 201 complaint which resulted in the 1981 negotiation of a VER with Japan.[13]

Pressures similar to those described above may arise in any importing country, leading to similar reactions. Indeed, it is conceivable that the developments in the U.S. could constitute a "demonstration effect," with other importing countries and their domestic industries witnessing and mimicing U.S. actions. To the extent that this is the case, in global terms the outcome will converge more rapidly to a situation of "managed trade."

The relationship between upstream and downstream protection is a probabilistic one. Upstream protection increases the likelihood of downstream protection by transmitting injury. The extent of injury depends on the relative importance of the protected component in the production process and the ease of substitution away from the protected component. Clearly other variables play an independent explanatory role. Among the most important is the political visibility (power) of the downstream industry. Furthermore, if both upstream and downstream industries are experiencing increased competitive pressure from imports, both may have an incentive to seek protection. In this case the action by the upstream industry may accelerate (as well as facilitate) the protectionist responses of the

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[13]See Hufbauer, Berliner and Elliot (1986), cases M-15, M-20 and M-22 concerning Section 201 cases brought by producers of bearings, fasteners, and motor vehicles. In 1979 an AD investigation was initiated against imported rail passenger cars and parts. Subsequent to a "no injury" finding, countervailing duty actions were launched in 1983 against railway cars and undercarriage components. This time injury was found and duties were imposed on the relevant imports of undercarriage parts in January 1984. The railway case was withdrawn by the petitioner during the same year so that it is unclear what the final outcome was. See USITC (1982, 1984) and USTR (1985).

downstream industry.

In the next section a formal model is presented in which an AD action upstream eliminates the economic viability of downstream firms.[14] On the surface, because such an act directly threatens the customer base of domestic components suppliers, seeking protection appears irrational. Nevertheless, as is more fully explored in Section IV, the probabilistic link between upstream and downstream protection is sufficient to rationalize such behaviour. The focus is on AD because of the widespread and increasingly frequent use that is made of this instrument of contingent protection. For the sake of exposition, the model describes an extreme case in which there is initially no domestic import-competing upstream industry. It serves to clarify the exposition without loss of generality. It should be emphasized at the outset that it is not at all necessary that no domestic component industry exists. All that changes if there is a pre-existing domestic component industry is that in most circumstances it will clearly be in the industry's interest to seek protection so that the apparent irrationality does not arise. The extreme case is interesting precisely because it leads to the conclusion that even in instances where a contingent trade policy action is likely to destroy the downstream customer, such action may nonetheless be rational.[15]

III. Predatory Antidumping?

Consider a sole manufacturer of a tradable component used in the production of a final good. The component manufacturer is located in country A. The component manufacturer is able to transfer its monopoly power downstream to the final goods

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[14]Early AD laws in the U.S. and Canada required some showing of predatory intent as a precondition for winning AD duties. While predatory intent has long since disappeared from the statutes, the notion of predatory pricing remains central to the language of the popular press and the business community. The model in the next section illustrates one way in which it is not dumping but the invocation of *anti*-dumping law that reflects "predatory" behaviour.

[15]See Hoekman and Leidy (1991) for a general model of protectionist pressure under unfair trade laws.

industry, which is assumed to be competitive. In long-run competitive equilibrium the final good's price is driven to the minimum of the long-run average total cost (LRATC), which is a function of the component price. There are also competitive final goods producers in country B which source components from the producer in country A. As the final good is traded internationally, long-run competitive equilibrium in the final goods market requires

$$(1) \qquad\qquad C_B(w_B9 = C_A(w_A) = P^W$$

where $C(w)$ denotes a long-run unit cost function, w is a vector of input prices, and P^W is the world price of the final good. We assume that the final goods producers in B are at a technologically-based disadvantage relative to those in A so that $C_B(w_B) > C_A(w_A)$ for all w_B r w_A. Hence, in order for the final goods industry in B to be economically viable, $w_B < w_A$ is necessary.

The component supplier in A perceives markets A and B to be segmented against re-export of components. It knows therefore that it can sell components in B as long as there is a component-price differential in favour of B firms such that equation (1) holds; that is, as long as B firms are not priced out of the market. Finally, we assume that the component supplier views the export market to be economically small so that it perceives that it can supply this market any amount up to a capacity constraint at the component price that just makes B producers of the final good competitive. In other words, it is as if the component supplier faces perfectly elastic demand for components abroad, but the component price at which foreign demand is perfectly elastic is sensitive to the component price selected for the domestic market.

The foreign and domestic market for components are linked implicitly through equation (1). When the firm is choosing the optimal component price for the home market it must consider the effect of its decision on the feasible price for the export market B. The firm maximizes the following objective function:

$$(2) \qquad w_A(x_A)x_A + w_B(w_A(x_A))x_B - C(x_A + x_B)$$

subject to a capacity constraint in the export market. Component quantities offered in the foreign and domestic markets are determined by the first-order conditions:

$$(3) \qquad MR_A(x_A) + (dw_B/dw_A)(dw_A/dx_A)x_B - C'(x_A+x_B)=0$$

$$(4) \qquad w_B(w_A(x_A)) - C'(x_A+x_B) = 0,$$

where equation (4) holds for an interior solution only. A corner solution results if at $x_B=0$, the left-hand side of (4) is strictly less than zero or at $x_B=\tilde{x}_B$, the capacity constraint facing final goods producers in B, the left-hand side is strictly greater than zero.

Suppose that x is chosen so that $MR_A(x\{ss\ ;A\})=C'(x\{ss\ ;A\})$. If x_B is selected to equal zero, this maximizes the objective function (2) if the left-hand side of (4) is strictly less than zero. Indeed, $x_B=0$ is a solution whenever $w_B(w_A(x\{ss\ ;A\})) < C'(x\{ss\ ;A\})$ Otherwise, $x_B >$

is a solution. Figure 1 shows conditions under which $x_B > 0$ will be optimal. At point A the firm can increase its profit by dumping some components in country B. But as it begins to do so the marginal revenue associated with component sales at home declines, since the middle term in (3) is no longer zero. This, in turn, induces the component supplier to cut back its component sales in A. As it does so the component price in A rises above w{ss ;A}, which increases the component price available in B. The static equilibrium in this case is shown in Figure 1 by points B and C.

Point C determines the equilibrium level of component production. The amount supplied to domestic final goods producers is indicated by point B. The difference C − B is the quantity of components "dumped" in country B. Notice that the equilibrium allocation

of components has the component supplier dumping in B, while the domestic component price exceeds what it would be if dumping were not feasible (i.e., $\hat{w}_B < w\{ss\,;A\} < \hat{w}_A$). This also suggests that in the final goods market the competitive equilibrium price exceeds what it would be if the component supplier were not dumping in B. This makes sense since it is the fact of dumping that enables the relatively inefficient producers in B to exist. The higher final goods price simply reflects their presence in the market.

This last observation is revealing. Suppose that a credible anti-dumping threat arises and effectively prohibits price discrimination, i.e., requires $w_A = w_B$. The component supplier knows that the entire demand for components in B is sustained only because it was offering a lower price to final goods producers in B. The latter's ability to profitably produce given the world price $P^W = C(\hat{w}_A)$, derives from the willingness and ability of the foreign component supplier to offer them a lower component price. In other words, their viability under competitive conditions depends on continued price discrimination in their favour. When that option is effectively eliminated by the imposition of an AD threat, the component supplier will revert to point A in Figure 1. The component price prevailing in A falls to $w\{ss\,;A\}$ and, in the long run, this drives the world price of the final good down to $P^W = C(w\{ss\,;A\})$. The lower world price of the final good now reflects the elimination from the market of the relatively inefficient producers in country B.

What is the source of the antidumping threat and what is the intent of such a threat? While no domestic component industry exists in B, a potential domestic component industry may exist, and may appear to be "materially retarded" by the foreign components dumping. Such firms have legal standing under GATT-conforming AD law.[16] The potential component suppliers may argue that they too could supply components at the higher price prevailing in A ($\hat{w}_A$) — given that the market is sealed against imports of components else dumping could not occur in the first place — but that they are prevented

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[16]Material retardation of the establishment of a domestic industry producing a like product is one of the permitted causes for acting against dumped imports under GATT rules.

from doing so as long as foreign dumping is occurring. They may credibly claim that they could profitably sell components at a price below $\hat{w}_A$ but above $\hat{w}_B$. This implies that all the technical requirements for obtaining AD protection have been met. The facts are incontrovertible. The component supplier in A is charging a price that is "less than fair value" ($\hat{w}_A > \hat{w}_B$). In addition, the establishment of a potential component industry in country B is being materially retarded by this pricing policy.

The intent of the industry association representing the potential domestic component suppliers would appear to be to drive up the component price to a point where domestic component production becomes an economically viable new line of business. Yet if domestic final goods manufacturers do not have access to low cost components they cannot compete on the world market. If the antidumping threat was intended to achieve the establishment of a domestic component industry, therefore, it appears to fail miserably. At the pre-AD equilibrium shown in Figure 1 potential component suppliers in B had to be able to offer a component price at least as low as $\hat{w}_B$. But this was not sufficiently high to produce a component industry in B. After the AD action is imposed, given the lower component price available in A and the consequently lower world price for the final good, potential component suppliers in B must be able to offer a price at least as low $\tilde{w}_B$. This implies that the likelihood of the emergence of a component industry in B under current market conditions has *declined* relative to that before the AD law.

Why would the potential components industry ever expend resources to bring an AD case under such circumstances? It may be that they lacked the necessary information. In this case, interestingly, it is AD and not dumping that produces a predatory result, as the AD action causes the final goods sector in B to lose competitiveness. If it is assumed instead that complete information is available to the potential components industry, one must question the rationality of the AD petition. This issue is addressed in the next section.

IV. Prospects for Cascading Contingent Protection
Across Vertically Linked Industries

The scenario presented above has an upstream import-competing potential component industry inflicting harm on a downstream industry by exercising its rights under antidumping law. Contrary to the initial appearance that such an action is irrational (under complete information), it can be rationalized in terms of a potential domestic component industry knows that there are no direct profits available from bringing an AD action, indeed on the surface there appear to be only process-related costs, the AD action may enhance profits through an indirect channel. The potential component industry is in a position to inflict systemic injury on a domestic downstream *import-competing* industry. As injury is a necessary condition (and, at times, sufficient de facto) for an industry to gain protection from foreign competition, the component industry may thus be able to induce the downstream industry to seek either emergency protection or, more likely, a VER, while also enhancing the probability that it will be granted. In this sense, the AD action taken upstream causes the intervention seeking downstream. Protection, if granted, is not likely to simply restore normal profitability. To the extent that rents are created, the possibility that upstream firms stand to share in these rents may be the proximate cause of the AD action.

As noted earlier, if a domestic component industry already exists and competes with imports, the rationale for seeking protection is much easier to discern. In this case, the apparent irrationality of initiating AD does not arise as the liklihood of extreme injury to the downstream industry will be much less. Nonetheless, it remains the case that upstream protection is likely to be directly detrimental to the downstream industry and thus create an incentive for seeking protection in turn. While the subsequent discussion continues to focus on the case of a potential domestic component industry, the discussion is quite general in that a similar analysis holds in instances where a domestic import-competing industry already exists.

Figure 2 characterizes the prospects facing the potential component industry and the

domestic user industry. The potential component industry chooses first whether or not to pursue AD (with some related process costs). If AD is pursued, the appropriate government agency assesses the facts and makes its ruling. Either AD duties are imposed, or they are not. The downstream industry, having observed the choice of the upstream industry and the outcome of the AD investigation (if applicable) can choose to seek protection (a VER), or to do nothing.[17] If a VER is pursued (with its related process costs), whether it is won or not is the decision of government authorities. The probability of obtaining a favourable outcome depends on several criteria, including the extent to which the industry appears to be injured. Hence the expected outcome of the VER petition is affected favourably by the imposition of AD duties, other things equal.[18]

Note that this is a sequential decision problem, as there is no simultaneous interaction between the potential component supplier and the downstream industry. In contrast to so-called emergency protection (i.e., Section 201 of U.S. trade law), it is appropriate to think of government as being passive because AD is not granted based on broad "social welfare" criteria. Indeed, AD laws offer governments little discretion in applying the technical criteria.[19] The discretion that does exist provides little room for

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[17]In the U.S., downstream firms will usually initiate AD or Section 201 emergency protection actions, as this is usually a necessary step in obtaining VERs. In what follows it is assumed that the downstream industry seeks a VER, but this is for illustrative purposes only. A more complete analysis would need to determine endogenously the optimal instrument of contingent protection for the downstream industry.

[18]The likelihood of winning a VER is also affected by the political visibility of the industry. Factors affecting this include aggregate employment, whether the industry is geographically concentrated or dispersed, the legislative power and committee memberships of interested representatives, and so on. As pointed out by Hillman, Katz and Rosenberg (1987) a firm or industry may attempt to manipulate its political visibility at the margin through its employment decision. Such behaviour would also fall under the general category of indirect rent seeking. Indeed, if Hillman-Katz-Rosenberg insurance action is taken downstream, this has the indirect effect of increasing the probability that an AD (or similar) action will be taken upstream. This is true since by increasing its political visibility, the downstream firm increases the likelihood that a strategy of indirect rent seeking upstream will be successful.

[19]Section 45 of the Special Import Measures Act (which implements the Tokyo Round Codes) introduces consideration of the public interest into Canada's unfair trade law. Such consideration is not *required*, however, and, as observed by Porteous and Rugman (1989),

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active gaming on the part of the government agencies involved. The decision to grant a VER downstream is also treated as exogenous. This is justified as an approximation since the government's role in negotiating a VER is largely reactive, as it begins only after sufficient injury has jarred the political process into motion.

The ordinal payoffs appear at the bottom of the decision tree and are assumed to reflect the ranking of expected profits for each industry in each state.[20] The current ordering of payoffs is justified in the following way. The payoffs for the potential component industry appear as the first entry in the ordered pairs. Comparing the first entry in the payoff (4,4) to all other payoffs for the upstream industry indicates that it stands to profit most if AD is pursued and won, and the downstream industry pursues and wins a VER. Under this scenario, the AD petition either drives the existing foreign suppliers out of the domestic market or causes them to recoil substantially from that market. The payoff to the potential domestic component industry is greatest since it is now in a position to sell to the domestic downstream industry without (or with greatly reduced) foreign competition, while the downstream industry has access to VER-generated rents, some of which can be captured through component pricing by the upstream firms.[21]

Observe that this state does not yield the highest possible payoff to the downstream industry. It stands to profit most when no AD is granted yet a (comparable) VER is nevertheless won (payoffs 0,5 and −1,5). In this case, downstream producers retain

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there were just three public-interest hearings initiated (from a pool of 29 completed unfair trade actions) in the four years following the inception of section 45. EC legislation has a "community interest" clause which reportedly has no practical effect (Messerlin, 1989a). Hence, government cannot be treated as an active player whose objective is to maximize social welfare even in instances where the public interest is at least nominally part of the unfair trade law.

[20] In principle, they may also represent the present value of expected utilities. The impact of alternative decision rules is discussed below.

[21] Note that to the extent that upstream firms can capture downstream protection-generated rents, the implicit assumption is that not all of the rents are taken away. If the upstream industry were to capture all of these rents there would be no incentive for the downstream industry to seek protection.

access to low-cost foreign components while also gaining protection from foreign competition through the VER. The upstream sector gains nothing in this case since they continue to face competition by low-cost foreign components.[22] It should be pointed out, however, that while this state offers the highest possible payoff to the downstream industry, it may be available with a very low probability due to the relatively healthy state of the industry in the absence of upstream protection. In those cases where AD is pursued but not granted, the payoff of -1 to the potential component industry reflects the process-related cost of initiating the AD investigation. These states are represented by the payoffs $(-1,5)$, $(-1,-1)$ and $(-1,0)$.

Now consider the case in which AD is won but no VER is granted downstream. Under the market conditions outlined in Section III, winning AD effectively eliminates the downstream sector's ability to profit (without protection). More generally, the downstream sector's profitability will be reduced. The payoff to the downstream industry is -2 if no VER was pursued (reflecting the loss due to the conferred injury), and -3 if the process cost associated with pursuing a VER was also incurred. In both cases the upstream industry's payoff is -1, reflecting the process costs incurred. Finally, if no AD is pursued by the potential component industry, they neither gain nor lose. Should the downstream sector pursue a VER and lose, a process-related cost is incurred without any offsetting benefit and the payoff is -1.

What is the likely path along the decision tree and on what does it depend? Without additional information, this is unclear, as the connection between decisions and payoffs is currently random, the probabilities are not specified and a decision rule is absent. Consider the issue of a decision rule first. For illustrative purposes only, suppose that a maximin decision rule is employed. Then a solution is, in fact, clear. If each agent acts so

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[22]It is commonly argued that VERs generate rents that are shared between the protected domestic industry and the competing foreign industry charged with reducing its exports. Note that if a foreign components producer is able to capture some of these rents, this is another channel through which VER-generated rents may accrue to foreign firms.

as to maximize the minimum possible payoff (sometimes called maximizing security), then no AD and no VER will be pursued under the current rankings as long as there is some uncertainty over the granting of contingent protection. The solution is payoff (0,0), i.e., the non-protectionist status quo. But such a decision rule clearly reflects a degree of risk aversion that is not representative of real-world economic agents. Will a more realistic decision rule produce the non-protectionist result?[23]

When contingent protection is an uncertain outcome, and when an expected utility or expected profit-based decision rule is used, it can be argued that the cascading of contingent protection across vertically linked industries becomes the most plausible result under circumstances that are not uncommon. Suppose that each industry is acting as if to maximize the capitalized value of expected profitability. That is, the upstream component industry will pursue AD only if the expected present value of profits under the pursuit of AD exceed those under passivity ("free trade"). The same applies to the downstream firm (industry). A VER will be pursued if the expected value of doing so (given the outcome of the decision of the upstream industry) exceeds that of doing nothing.

The decision taken by the upstream and downstream industry is dichotomous: pursue protection or remain passive. The choice is based on a comparison of the capitalized value of expected future profit flows under protection versus those under "free trade." Under expected profit maximization (risk neutrality) this implies a simple comparison of these expected capitalized values. As the present values associated with "free trade" and protection are random variables, under expected utility maximization (and risk aversion)

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[23]Note that the maximin decision rule will produce a different path if we move to the certainty case. If both AD duties and a VER will be granted with certainty when pursued, the equilibrium path shifts to the state in which both AD and a VER are pursued and awarded. That is, in deciding whether to pursue AD, the upstream industry faces a payoff of 0 with certainty if no AD is pursued. It faces a payoff of 4 with certainty if it can be sure that the downstream firm will pursue a VER once AD has been imposed. Since the decision tree, payoffs and probabilities are all common knowledge, they can indeed be certain that a VER will be pursued (and so won), since this is the optimal choice under maximin for the downstream industry. Hence, the upstream industry chooses AD and the downstream industry chooses to pursue a VER. In this case, the maximin decision rule produces a cascading of contingent protection across vertically linked industries.

the variance of the present value of profit becomes relevant. If the payoffs at the bottom of the decision tree were expressed in terms of expected utilities, the resulting ranking need not be identical to that based on expected profits. As discussed further in the Appendix, if variances are sufficiently different under protection versus free trade, rankings may differ depending on the decision rule that is imposed. Precisely what type of rule is followed is not important. What matters is the ranking of the payoffs associated with each state. For purposes of discussion, in what follows it is assumed that an expected profit decision rule is in place.

Several observations can then be made. The expected value of pursuing AD relative to remaining passive depends on several factors, including the following: (1) the level of the process costs associated with an AD petition; (2) the likelihood of winning AD; (3) the likelihood of the downstream firm pursuing a VER given that AD duties have been imposed; (4) the probability of winning a VER given AD duties; (5) the expected profitability of a VER if granted; and (6) the extent to which the upstream firm can expect to capture a share of the VER-generated downstream rents.[24] In general, the stronger the link between a successful AD petition and the likelihood of winning a VER, the greater the incentive facing the upstream industry to indirectly seek a VER downstream by manipulating the health of the downstream industry via an AD action. If the probability of winning a VER is closely related to the industry's current health, and if a successful AD petition will seriously injure the downstream industry, then a successful AD petition can substantially increase the probability of that a downstream industry will pursue and win a VER. Finger and Murray (1990) argue that in the United States the injury criterion is central to the likelihood of gaining a favourable outcome in an unfair trade case. Hence manipulating the health of a downstream industry can be crucial to the decision to grant protection. In effect, the *raison d'etre* for the AD petition is as much to obtain the VER

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[24]As noted in the Appendix, if an expected-utility-maximization rule is followed, the size of the relevant variances may also be important.

downstream as it is to weaken the competitive position of the foreign component supplier in the domestic market.

V. Anti-Protectionist Activities and Vertical Linkages

The model of vertical linkages presented above has a number of implications for the timing of anti-protectionist activities. When an upstream industry pursues protection in the absence of the incentives outlined in the model, it will be in the interest of downstream users to oppose it. Other things equal, the more significant is the protected component to downstream production and the fewer are the available substitutes, the more anti-protectionist activity one would expect to see because of the expected costs to downstream firms. Indeed, to the extent that downstream users can mobilize quickly, one would expect such opposition to arise early in the process, possibly during the petition stage or shortly after protection has been won. Yet often anti-protectionist forces appear to descend well after upstream protection has been granted, if at all. The question then arises to what extent can delays in anti-protectionist activity, or persistent inactivity, be attributed to the vertical linkages across instances of contingent protection.

In their analysis of antiprotectionist responses to VER or Section 201 intervention seeking, Destler and Odell (1987) point out that in response to recurring petitions for protection by the U.S. steel industry in the late 1970s and early 1980s, there was "...virtually no observable opposition from U.S. steel users."[25] They state further that some steel users "*even helped the other side*".[26] As possible explanations for the absence of opposition (they offer none for the pro-protection activity) they suggest the following: that steel users suffer from the free rider problem, that "such firms tend to think of imports as, basically, something bad," and that "some are more inclined to seek protection for their own products." With respect to the second rather sociological explanation, all we

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[25]p. 46. See also their Appendix tables A6 and A7.

[26]These and the following quotes are from pp 46–47. Emphasis added.

will say is that competition fortunately tends either to disabuse economic agents of such superstitions or to purge them from the market. The observation that steel users may suffer from the free rider problem is, in fact, contradicted by the authors' own observation that some steel users "helped" the steel industry — and thus expended resources — to seek protection. In a footnote relating to the final possible explanation, which they did not pursue, Destler and Odell state that "In theory, of course, a firm could actively seek open markets for its inputs and shelter for its outputs. While such a stand would be *economically rational*, it could be politically embarrassing and hard to sustain" (p. 47, emphasis added).

To the contrary, the foregoing analysis suggests that at times it is *not* economically rational to oppose upstream protection precisely because such protection, by conferring injury, may aid downstream firms in their own efforts to gain protection. If the downstream industry expects the injury conferred from upstream protection to significantly enhance its chances of gaining a VER, then the injury may be perceived as a gift, not something to lobby against. At least this is true in the short run, before the resolution of uncertainty concerning the benefit of conferred injury.[27] Hence the observed delay in anti-protectionist activity among downstream firms, and the assistance given to producers of semi-finished steel is fully rationalized by the theory of indirect rent seeking and vertical linkages. In the case of steel most major domestic users demonstrated no activity against protection, e.g. motor vehicles and parts, metal cans, bearings, screw machine products, industrial fasteners, and railroad equipment. Did these industries engage in protection-seeking activity during the "wait-and-see" period? As noted in Section II, many of these user industries indeed obtained or lobbied for protection following the upstream episode. The second paradox stated at the outset of this paper — that some

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[27]Much will depend here on possibilities for downstream firms to substitute away from the protected input. To the extent that substitution is relatively easy, upstream firms will have less "power" over downstream firms. But, the downstream industry may still abuse the upstream threat to get protection. See also Hoekman and Leidy (1991).

downstream firms "even helped the other side" — is entirely consistent with the incentives underlying the theory of cascading contingent protection.

VI. Conclusions and Implications for Further Research

In this paper a simple model was developed in which component dumping occurs. For illustrative purposes, dumping by the foreign industry is assumed to be just sufficient to establish the viability of domestic final goods producers on the world market. That is, in the absence of protection, access to the dumped component is necessary and sufficient to the existence of the domestic final goods industry. Hence the domestic final goods industry is hanging by the thread of dumped components in a competitive world market. Even in such an extreme case, where an AD action upstream may set in motion the apparent demise of the domestic final goods industry and thus paradoxically appears to inhibit the establishment of a domestic component industry, clear incentives exist for the initiation of an AD action upstream. Of course, these incentives also exist in less extreme instances where protection-seeking is more obviously in the interest of import-competing upstream firms. One such instance is the case where the domestic industry is already engaged in competing with imports. In practice this will usually be the case (see Section II). Another instance is if the upstream and downstream industries are related. In this case the expected value of joint profits will be maximized, with the decision whether to pursue protection upstream being determined by a straightforward optimization problem. The general point is that by seeking protection the upstream firm can favourably influence the probability of protection downstream with an eye toward capturing some of the expected rents.

Based on these incentives a theory of cascading protection in the presence of vertically-linked markets was developed. The connections are twofold: one rather obvious, the other quite subtle. Contingent protection tends to flow downstream naturally because of the transmission of injury. Even when upstream suppliers give no thought to the welfare of their downstream customers, the transmission of injury establishes a vertical

link across instances of contingent protection. In addition to this, contingent protection may be pursued precisely *because* of the likelihood of downstream injury and cascading protection. In this way the upstream industry engages in indirect rent seeking. Without this possibility, one would expect fewer instances of intervention seeking in upstream industries than otherwise, more anti-protectionist activity, and the absence of cases where unaffiliated downstream firms actually support upstream bids for protection.

The analysis offers insight into the design of trade policies that would reduce and perhaps preclude the protectionist outcomes described above. If a government could credibly precommit to not granting protection in downstream industries, not only would it eliminate the pursuit of protection downstream, but it also creates an inhibiting effect that is transferred upstream where the incentive to pursue AD may be sharply reduced as well. More specifically, since the *raison d'etre* for some AD petitions may be the pursuit of a downstream VER, eliminating the VER option can have the added benefit of removing (or diminishing) the incentive to pursue structurally disruptive antidumping duties in components industries.

While the foregoing analysis has focused on a specific example for the sake of expositional clarity and simplicity, the results are certainly generalizable. There is, however, a need for a more comprehensive analysis of the possible linkages across instances of contingent protection. Given the existence of multiple instruments of contingent protection at each stage of the production stream, the choice of optimal instruments presents itself as a problem for further study. There is also the possibility that cascading proceeds from downstream to upstream protection. Much will depend here on the extent to which the upstream industry is able to capture downstream rents. Additionally, upstream and downstream producers might play games over the distribution of the expected rents from protection, implying a need to go beyond the sequential decision framework used above to allow for strategic interaction between the industries involved. Such research is likely to enhance our understanding of the intervention-seeking incentives

facing vertically linked industries.

Nevertheless, the point of departure for further research is established by the central insight of this paper that in an area where others have seen only a divergence of interests facing domestic import-competing suppliers and users, our analysis suggests a potential confluence of interests. And this confluence of interests points to an important link across instances of contingent protection along the production stream.

References

Aggarwal, Vinod. 1985. *Liberal Protectionism: The International Politics of Organized Textile Trade*. Berkeley: University of California Press.

Bhagwati, Jagdish. 1988. *Protectionism*. Cambridge, MA: MIT Press.

Bhagwati, Jagdish. 1982. "Directly Unproductive, Profit-Seeking (DUP) Activities," *Journal of Political Economy*, 90, 988–1002.

Destler, I. M. and John Odell. 1987. *Anti-Protection: Changing Forces in United States Trade Politics*. Washington D.C.: Institute for International Economics.

Feenstra, Robert C. 1989. "Auctioning U.S Import Quotas, Foreign Response, and Alternative Policies," *The International Trade Journal*, 3, 239–259.

Finger, J. Michael and Tracy Murray. 1990. "Policing Unfair Imports: The United States Example," *Journal of World Trade*, 24, no. 4, 39–55.

Finger, J. Michael, H. Keith Hall and Douglas Nelson. 1982. "The Political Economy of Administered Protection," *American Economic Review*, 72, 452–66.

Giesse, Craig and Martin Lewin. 1987. "The Multifiber Arrangement: "Temporary" Protection Run Amuck," *Law and Policy in International Business*, 19, 51–170.

Hillman, Arye, Eliakim Katz and Jacob Rosenberg. 1987. "Workers as Insurance: Anticipated Government Assistance and Factor Demand," *Oxford Economic Papers*, 39, 813–20.

Hoekman, Bernard and Michael Leidy. 1991. "Vertically Related Markets and Protectionist Pressures Under Unfair Trade Laws," mimeo.

Hoekman, Bernard and Michael Leidy. 1990. "Policy Responses to Shifting Comparative Advantage:" Designing a System of Emergency Protection," *Kyklos*, 43, 25–51.

Hoekman, Bernard and Michael Leidy. 1989. "Dumping, Antidumping, and Emergency Protection," *Journal of World Trade*, 23, (October), 27–44.

Hufbauer, Gary, Diane Berliner and Kimberly Elliot. 1986. *Trade Protection in the United States: 31 Case Studies*. Washington D.C.: Institute for International Economics.

Jackson, John H. 1989. *The World Trading System: Law and Policy of International Economic Relations*. Cambridge, MA.: MIT Press.

Jones, Kent. 1984. "The Political Economy of Voluntary Export Restraints," *Kyklos*, 37, 82–101.

Jones, Kent. 1986. *Politics vs. Economics in World Steel Trade*. London: Allen & Unwin.

Krueger, Anne. 1974. "The Political Economy of the Rent Seeking Society," *American Economic Review*, 64, 291–303.

Leidy, Michael and Bernard Hoekman. 1989. "Spurious Injury as Indirect Rent Seeking: Free Trade under the Prospect of Protection," *Economics and Politics*, forthcoming.

Leidy, Michael and Bernard Hoekman. 1990. "Production Effects of Price- and Cost-based Antidumping Laws under Flexible Exchange Rates," *Canadian Journal of Economics*, (November), 572-94.

Messerlin, Patrick. 1989a. "The EC Antidumping Regulations: A First Economic Appraisal, 1980-85," *Weltwirtschaftliches Archiv*, 125, 563-87.

Messerlin, Patrick. 1989b. "The Anti-trust Aftermath of Antidumping," The World Bank, mimeo.

Porteous, Samuel and Alan Rugman. 1989. "Canadian Unfair Trade Laws and Corporate Strategy," *Review of International Business Law*, 3, 237-70.

Staiger, Robert and Frank Wolak. 1989. "Strategic Use of Antidumping Law to Enforce Tacit International Collusion," Stanford University, mimeo.

Stockhausen, Gerard. 1988. "A Model of Exporting Country Response to the Threat of a Foreign Import Quota," *The International Trade Journal*, 2, 319-336.

Tullock, Gordon. 1967. "The Welfare Costs of Tariffs, Monopolies and Theft," *Western Economic Journal*, 5, 224-32.

United States International Trade Commission. 1980 and 1984. *Operation of the Trade Agreements Program*. Washington D.C.: USITC.

United States Trade Representative. 1985. *Annual Report of the President on the Trade Agreements Program*. Washington D.C: USTR.

Appendix

The purpose of this Appendix is to clarify the conditions under which the rankings of payoffs under maximization of expected profit - $E(\bar{\pi})$ - will correspond to those under maximization of the expected utility of profits - $E[U(\bar{\pi})]$. Let $\bar{\pi}_F$ and $\bar{\pi}_P$ be the present value of profit under free trade (no intervention) and protection, respectively. For simplicity, let $\bar{\pi}_F$ - i.i.d. $N(\mu_F, \sigma_F^2)$ and $\bar{\pi}_P$ - i.i.d. $N(\mu_P, \sigma_P^2)$ in each future period. Since under the normality assumption $E[U(\bar{\pi}_i)]$ $(i=P,F)$ can be written as a function of the first two moments, $E[U(\bar{\pi}_P)]$ and $E[U(\bar{\pi}_F)]$ can be expressed as $V(\mu_P, \sigma_P^2)$ and $V(\mu_F, \sigma_F^2)$, respectively, where preferences are not state dependent and the first derivatives are $V_1 > 0$ and $V_2 < 0$ (the latter implies risk aversion). If $\sigma_P^2 = \sigma_F^2$, then the ranking of $E[U(\bar{\pi}_i)]$ corresponds to the ranking of $E(\bar{\pi}_i)$. More generally, as long as $\mu_P > \mu_F$, then $V(\mu_P, \sigma_P^2) > V(\mu_F, \sigma_F^2)$ for all $\sigma_P^2 \leq \sigma_F^2$. Given $\mu_P > \mu_F$, for the ranking of $E[U(\bar{\pi}_i)]$ to reverse that based on $E(\bar{\pi}_i)$ it is necessary that $\sigma_P^2 > \sigma_F^2$. Only if this is the case is it possible that under an expected-utility decision rule agents could prefer free trade in instances where an expected-profit rule indicates a preference for protection.
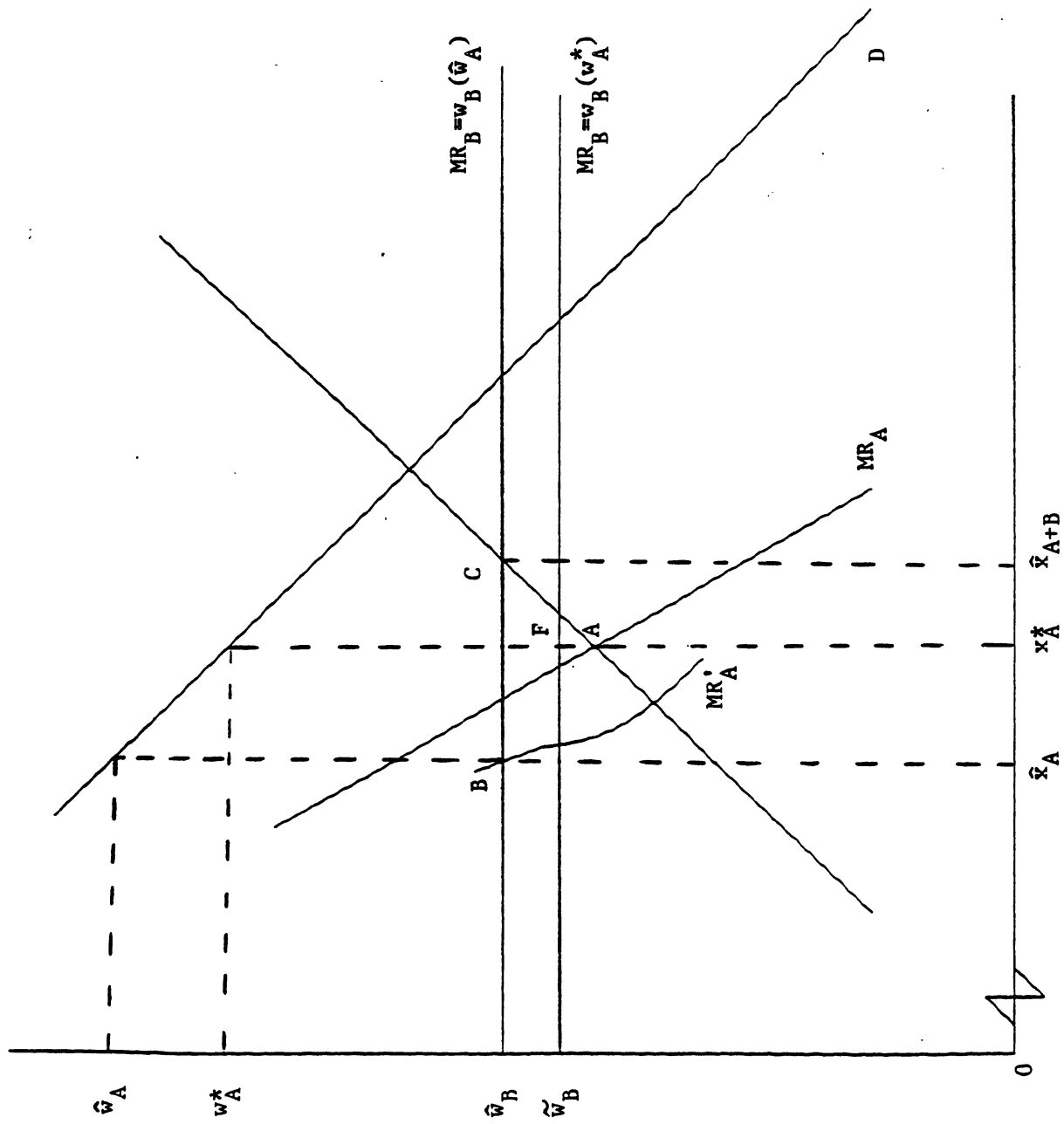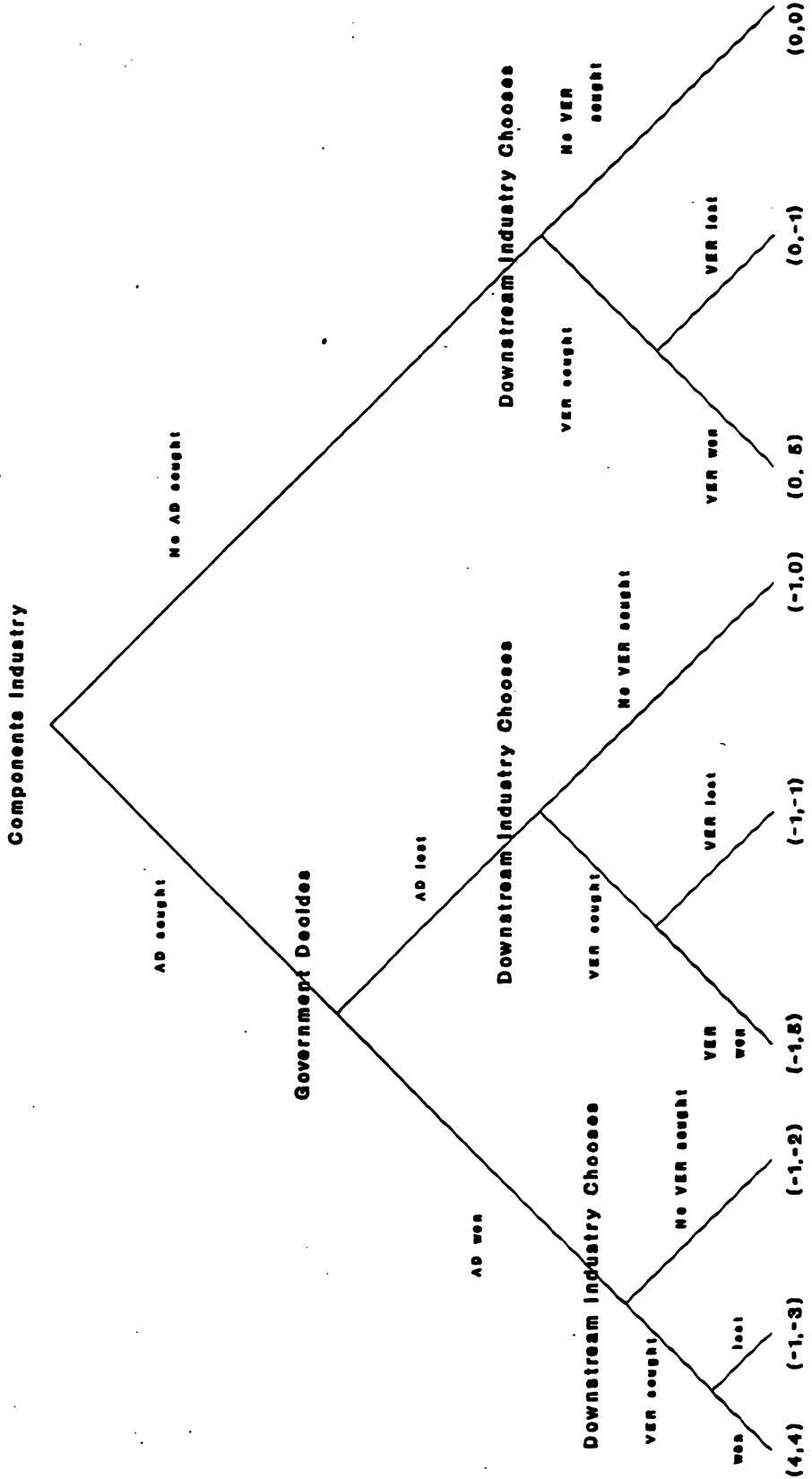
Figure 1

Figure 2