REGULATORY THEORY AND ITS APPLICATION TO TRADE POLICY:

A Study of ITC Decision-making

Thesis by

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DEDICATION

To my best friend, Philip, my parents, and all of my siblings.

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ABSTRACT

This thesis concerns the governmental regulation of internationally traded goods produced by U.S. industries. To help them compete, industries seek tariffs, quotas, and other types of non-tariff trade barriers from the government. The United States International Trade Commission plays a major role in approving and providing such restrictions. In an attempt to explain and better understand trade policy outcomes, I apply the capture theory model of regulation most recently discussed by Becker (1983) to a study of the International Trade Commission. Whether or not an industry applies for protection, and whether or not it is granted some form of trade relief by the ITC may depend on a number of political and economic factors. In this work, I seek to predict, on a basis of domestic politics, the factors that affect the demand for and supply of trade protection for U.S. industries. A nested logit model is used in the final analysis to determine if industries use utility-maximizing behavior in deciding whether or not to file a petition with the ITC, that is, if industries base their decisions on their perception of the expected utility of getting protection. I draw two major conclusions from this work. First, the policy choices of the ITC do not appear to minimize deadweight loss to society which is the hypothesis that drives Becker's model of regulation. Second, I determine from my analysis that self-selection may be a problem in predicting protectionist policy outcomes; I accept the hypothesis that industries self-select themselves in applying for protection from the ITC.

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INTRODUCTION

Industries in the United States enjoy varying degrees of protection from foreign competition. While economic reasons may exist to justify some of these differences in protection, most economists and political scientists would agree that one needs to look at the politics behind protective legislation to understand industry-specific differences in government assistance. The purpose of this work is to try to explain the varying levels of protection across industries by focusing on factors that affect both the supply of and demand for the regulation of trade. What circumstances lead industries to request protection, and what factors affect the government's decision of whether or not to supply that protection? Both industries and the government presumably have incentives to pursue utility-maximizing courses of action. On the demand side, when an industry seeks a higher tariff, the benefits from that tariff presumably outweigh the costs of applying and lobbying for protection. On the supply side, when the government chooses to protect an industry, the political benefits in terms of, for example, votes or contributions presumably exceed the costs in terms of the lost support from those harmed by the policy.

Given the above incentives of the actors, I seek to predict, on a basis of domestic politics, the factors that explain industry and government decisions on trade matters. Why, for example, did the electric golf cart industry get higher tariffs in 1976 when the hand tool industry was turned down? In 1983, frozen orange juice makers got protection, but the canned mushroom industry was unsuccessful. What incentives did these industries have to apply for higher tariffs, and on what basis were golf carts and orange juice chosen for protection while hand tools and mushrooms were not? In other words, what factors best explain the actions of interest groups and the decisions of regulators? In pursuing answers to these questions, I hope

to develop not only a better understanding of how trade policy is made in the U.S. but also a better understanding of government regulation in general.

Though a number of studies have recently been done on the International Trade Commission, the conclusions that have been drawn in these works are questionable. One major problem in the literature on both the International Trade Commission and the regulation of trade in general has been a failure of scholars to account for both the supply and the demand sides of the regulatory issue. This study makes an attempt to test for the potential problem of industries self-selecting themselves when seeking regulation.

This work is organized as follows. The first chapter includes both a brief history of trade policy in the U.S. from the imposition of the first tariff act to the present and a discussion of the International Trade Commission and its role in the making of trade policy. Chapter 2 reviews the existing literature on trade regulation, particularly studies on the International Trade Commission. Chapter 3 explores general theories of regulation, especially examining the capture theories and Becker's model of pressure group competition applied to trade policy. In the fourth chapter, an econometric model is developed for testing several hypotheses about regulation in relation to the capture theories developed in Chapter 3, the data to be used are discussed, and the estimations and results are presented. Finally, I summarize the findings and discuss the implications of this work to the study of trade and regulation in general.

CHAPTER 1: HISTORY OF TRADE LEGISLATION AND THE ROLE OF THE ITC

The power to regulate international trade, granted to Congress under the Constitution, has evolved into a complicated set of procedures involving all branches of government. In the 18th and 19th Centuries, setting tariffs was a major activity of Congress. However, by the 20th Century, it was evident that Congress was moving away from any direct activities in the regulation of trade. In 1934, Congress delegated the power to raise and lower tariffs to the President. Then by the late 1940s and early 1950s, the United States Tariff Commission (the International Trade Commission since 1974), which had been created in 1916 as a fact finding agency, acquired greater authority from Congress in the decision-making process of trade regulation. The history and evolution of trade policy in the Unites States provides useful insights for understanding how trade is regulated today.

History

The history of tariffs in the United States began in July 1789 when the first tariff act was passed. Tariffs were introduced mainly for raising federal revenue. From 1789, through the early 1800's, the number of tariffs and the levels of tariffs were continuously rising with only occasional minor reductions. These high tariffs continued to exist through the 1800s, and political pressure mounted for their reduction.[1] But reductions were small or nonexistent until the 1900's despite numerous efforts at increasing free trade.

In 1908, President Taft campaigned with the promise to revise and lower tariffs. Once

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1. John M. Dobson, *Two Centuries of Tariffs*. (Washington D.C.: U.S. Government Printing Office, 1976), pp. 8-16.

again, Congress undertook the task, but strong protectionist forces in the Senate managed to append 847 amendments which mostly increased tariffs to the House version of the tariff revision bill.[2] The result was higher tariffs under the Payne-Aldrich Tariff Act of 1909 which was passed and signed by Taft. It was becoming apparent that Congress could not pass legislation to lower tariffs without succumbing to protectionist pressures. Included in this tariff rate revision bill was the "maximum-and-minimum clause" that allowed the President to add a 25% tariff increase on goods from countries that were believed to use discriminatory tariffs of their own. A Tariff Board, or special panel of advisors, was created to assist the President in this decision. Three years later, this panel disbanded when Congress cancelled its appropriations on grounds that they were biased toward protectionism.[3]

The next major event in the history of tariff legislation occurred in 1913. First the Underwood Tariff Act was passed cancelling the maximum-and -minimum clause and granting "substantial" reductions in tariffs.[4] But more important was the imposition of the first income tax law under this act. The collection of income taxes by the federal government changed the fundamental nature and reason for having tariffs. Tariffs were no longer a major revenue raiser for the federal government.

But in 1922, under the Fordney-McCumber Tariff Act, Congress once again raised tariffs to the higher 1909 rates and delegated to the President limited power to adjust the tariff levels up or down by 50% under a flexible tariff provision. His power was limited in that the Tariff Commission was to investigate each tariff case prior to Presidential action. Then in

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2. Ibid., pp. 24-26.

3. Ibid.

4. Ibid., p. 27.

1930 due to successful logrolling politics in Congress, the Smoot-Hawley Bill was enacted creating the highest tariff levels in U.S. history. Smoot-Hawley was the last bill passed in which Congress itself established across the board tariff rate schedules. After passage of the 1934 Trade Agreements Act, the power to raise and lower tariff rates became the task of the executive branch of government.

The Tariff Commission, a regulatory agency designed to assist the President in tariff and trade related decisions, had been created under Woodrow Wilson in 1916. The Commission was to consist of six members with no more than three members from the same party; it was to be non-partisan. The Tariff Commission was created solely for information gathering. It was to investigate the effects of such things as customs laws, competition abroad, unfair trade practices, and the dumping of goods on the U.S. economy. It could respond only to requests made by the President or Congress, and not individual firms.[5]

In 1922, the Commission was given a role in implementing U.S. trade policy. Under the Fordney-McCumber Tariff Act, the Commission was to recommend tariff adjustments to the President under the flexible tariff clause, section 313. The Commission began to hold public hearings and anyone was now allowed to request an investigation if they had sufficient evidence of harm due to imports. It also investigated unfair practices under section 316, and discrimination under section 317. It recommended remedies to the President in order to improve international trade practices. Finally, under section 315, the Commission was given the power to investigate tariffs to insure that rates equalized the differences in costs of production between U.S. and foreign firms.

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5. Ibid., pp. 85-86.

In 1926, the Senate began an investigation into the practices of the Tariff Commission of the grounds that the agency was biased toward protectionism in its rulings. By 1929, thirty-seven investigations had been completed by the agency under section 313, the flexible tariff provision of the 1922 tariff act. Of these thirty-seven cases, only five had resulted in tariff reductions while thirty-two had led to increased tariff rates. The result was a major reorganization of the Commission, shortening the Commissioner's terms of office and terminating all existing members and allowing President Hoover to recreate a "more acceptable" agency.[6] The overall role of the agency remained basically the same as under the 1922 act.

Recommendations under the procedure followed by the Tariff Commission, however, took time. Reorganization and increased funds improved operations of the Commission but major changes in overall tariff levels did not occur. Other countries responded to U.S. practices with higher tariffs of their own. Also, trade agreements with other nations required treaties which could not get past a two-thirds vote in the Senate. In 1934, under the Trade Agreements Act, reciprocity became the new U.S. policy tool in trade legislation. The reciprocity provision allowed the President to negotiate trade agreements with foreign countries to raise or lower tariffs by as much as 50% *without* any Tariff Commission investigation or recommendation. With this act, Congress transferred even more power to the executive branch by eliminating the go-between role of the agency. The President was still to seek information and advice from the Commission but he need not wait for any recommendation. Thus the flexible tariff provision became obsolete since reciprocal agreements had a much larger impact on tariff levels.

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6. Ibid., p. 100.

The 1934 act granted the president three years of negotiating authority. Congress expanded presidential powers in 1935 by adding section 22 to the trade law, which allowed the President to place import fees and quotas on all agricultural goods which interfered with or had an effect on any U.S. agricultural programs. In 1937, Congress renewed the 1934 act and allowed Tariff Commissioners to take part in the negotiations. This act was extended for two additional three year periods in 1940 and 1943. In 1945, the act was revised to allow an additional 50% reduction in tariffs from the current levels. (Reductions had previously been based on 1930 levels) Besides participating in the reciprocal tariff reduction investigations, the Tariff Commission in this period also continued its own investigation procedures, but these functions became less important. By 1950, a total of 112 cost of production investigations (section 315 of the 1922 trade act, renamed section 336 in the 1930 trade bill) had been conducted. Forty-four resulted in increases by the President. Twenty cases resulted in tariff decreases, and seven cases got both some increases and some decreases. The Commission recommended no change in thirty-six cases and its recommendation was rejected in five cases.[7]

With the creation of the General Agreement on Trade and Tariffs (GATT) in 1947, the Tariff Commission's authority to regulate trade was revived. The GATT was a multinational agreement under which countries negotiated reciprocal reductions in tariffs and the elimination of other protectionist measures such as quotas, subsidies, and tax breaks. Written into the agreement was an "escape clause" which allowed any nation to withdraw from an agreement in case of "injury" to a domestic industry. Through congressional legislation, the Tariff Commission was given the power to investigate injury claims and report recommendations on these escape clause cases to the president, who had ultimate decision making authority. Escape

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7. Ibid., p. 109.

clause investigations soon became the major task of the agency.

In 1948, the Trade Agreements Act came up for renewal. Congress passed a bill extending negotiating authority for only one year. Also in the bill was a provision forbidding the Tariff Commission from participating in the reciprocal trade negotiating process any longer. Congress ruled that the escape clause investigations were to be continued. And finally, a new provision was created, giving the Tariff Commission authority to determine the "peril point" for each article subject to tariff reductions. The Tariff Commission was required to study each good and determine a lower limit for the tariff below which the industry would suffer injury. That is, they would determine the point at which further reductions in tariff rates would bring peril to the U.S. industry. The president was not allowed to negotiate a tariff below this point without reporting to Congress. In 1949, the peril point provision was repealed; Congress approved a two year extension of negotiating authority for the president, and extended the Trade Agreements Act for three years.

The escape clause, allowed by GATT, was first implemented by executive order in 1947. In 1948, Congress passed an escape clause provision under section 7 of the bill, but proceedings were still under the executive order until 1951. In this year, Congress passed a bill which spelled out to the Tariff Commissioners the exact criteria to be used in granting protection to industries. (These included such things as downward trends in production, employment, prices, profit, sales, and market share or an increase in imports of a good.) Relief options were suspension of trade concessions, (i.e. cancelling tariff reductions), modification of concessions, withdrawal of concessions, or imposing quotas. The peril point provision was also reinstated in the 1951 bill and would remain in effect until 1962.

Through the 1950s, Congress continued to renew the Trade Agreements Act giving the President the authority to lower tariffs, but also slowly increased the powers of the Tariff

Commission and Congress to oversee presidential actions. In 1953 and 1954, extensions were granted for one year at a time. In 1955, the act was extended for another three years. Also, final decision making authority in antidumping investigations was taken out of the hands of the Treasury Department and given to the Tariff Commission. (The Treasury Department was to continue its investigative proceedings but was now required to report its finding to the Tariff Commission.) In 1958, Congress renewed the trade agreement negotiating authority of the president for another four years and they assumed the power to overrule those escape clause decisions for which the President did not implement what the Commission had recommended.

In 1962, Congress passed a major extension of the Trade Agreements Act. They gave the president a five year renewal of his negotiating authority. This also allowed another 50% reduction in tariffs from the 1962 levels. The peril point provision was dropped from the legislation. And, the Tariff Commission was left with the authority to study the effects of trade concessions but could only report on "probable effects." Section 7, the Escape Clause Investigations provision, was continued in basically the same form as that passed in 1951, with an added provision for the Commission to review escape clause relief measures to determine if the need for such relief had ended. Section 301 was added to give assistance to individual firms and groups of workers who were being injured by tariff reductions. Firms could file for loans, tax breaks, and technical assistance, while workers were eligible for unemployment compensation, retraining, and relocation assistance. The Tariff Commission could make recommendations to the president for granting protection to firms and workers under this provision. For both escape clause cases and adjustment assistance cases, the president then had sixty days to act on the Commissions recommendations before Congress, by majority vote, could act to impose the Commission's recommended solution. Finally, it was made clear that injury cases filed under either the Escape Clause or the Adjustment Assistance Act had to be *mainly* the

result of tariff reductions on the good to be eligible for relief (not just "due in whole or in part" as stated in the 1951 law).

From 1948 to 1962, there were 128 escape clause cases filed by firms with the Tariff Commission. But because of the stringent requirement that injury had to be based mainly on tariff reductions, only 23 cases were filed from 1962 to 1974. In 1974 this requirement was again revised; increased imports due to tariff concessions had only to be a "substantial" cause rather than the "major" cause of injury. In theory this would make it easier to get protection from the Commission through escape clause petitions. Only three cases were filed from 1972 to 1974, compared to 31 for the three years following repeal of the tariff reductions requirement, 1975 to 1977. A total of 57 cases were filed for the ten years from 1975 through 1984 (Table 1).[8]

Table 1

Escape Clause Cases

Period	*Number of Cases Filed*
1948-62	128
1962-74	23
1975-84	57

In those years when escape clause injury relief from the ITC and the President was very difficult to get (1962-74), industries looked more to Congress to directly impose protec-

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8. U.S. International Trade Commission *Annual Reports*, (Washington D.C.: U.S. Government Printing Office, volumes for 1948 to 1984).

tion. Numerous protectionist bills were introduced into Congress in these years, especially from 1963 to 1967 when the Kennedy Round GATT negotiations took place.[9] These negotiations resulted in across the board tariff cuts of 36 to 39 percent. They were carried out under the Trade Expansions Act of 1962 which expired shortly after the end of the Kennedy Round and did not get renewed, despite repeated attempts, until 1974.

The Trade Act of 1974 was the result of several years of debate and negotiations. The Tariff Commission was renamed the International Trade Commission (ITC). The Commission was made more independent of the executive branch by placing its budget appropriations directly in the hands of Congress, out of control of the Office of Management and Budget.[10] Also the ITC's permanent status was cancelled, requiring it to get yearly authorization from Congress as well as appropriations. Trade adjustment assistance authority was transferred to the Department of Commerce for firms and the the Department of Labor for worker petitions. Injury under the escape clause no longer had to be the result of tariff reductions. Also, under the Trade Act of 1974, escape clause petitions can be filed by any industry spokesman, a firm, an individual, a union, or any group of workers. Relief is now granted to a domestic industry if imports have been "a substantial cause of serious injury or the threat thereof." The president still has the power to decide the nature and extent of relief after receiving the recommendation from the ITC, but Congress has the authority through a concurrent resolution to override the president if he does not grant the recommended relief. Initially, ITC recommendations had to be passed by a majority of the Commissioners to allow congressional override, but this was revised in 1976 to plurality rule. Antidumping proceedings continued under ITC authority, and

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9. See Dobson or the *Congressional Quarterly*, (Washington D.C.: CQ inc., volumes for 1963-67).

10. Dobson, p. 125.

Countervailing Duty investigations were added to the tasks of the ITC. The Trade Act of 1974 basically comprises present day trade policy and proceedings (See Appendix A for summary of Key Trade Legislation).

The making of U.S. trade policy and the actors involved have changed over the years. The major actors have been Congress, the President, and the International Trade Commission. The focus of this study is on the ITC and Congress (and indirectly the executive and other relevant agencies). In intervening years between major trade agreements negotiated by the President, most changes in tariffs and quotas are decided by the ITC or Congress. The ITC reviews and rules on industry, firm, and worker complaints on trade matters, and Congress passes or threatens to pass protectionist legislation or free trade measures in response to constituent pressures. Both bodies have played a major role in affecting trade policy in the United States. But by far, the vast majority of case work carried out in the area of trade in the last decade has been done by the ITC. The next section focuses on the role of the ITC in making trade policy.

ITC Activities

The International Trade Commission gathers data and conducts investigations in a number of areas. Six major statutes which involve the ITC include provisions providing for: General Purpose Investigations (section 332), Agricultural Adjustment Investigations (section 22), Unfair Trade Practices Investigations (section 337), Escape Clause Investigations (section 201), Antidumping Investigations (sections 733 and 735), and Countervailing Duty Investigations (sections 703 and 705).[11] The General Purposes Investigations are basically fact finding

11. See the U.S. International Trade Commission *Annual Reports,* for excerpts from the original texts and a description of these six statutes.

studies, conducted upon official request or upon the Commission's own initiation, to aid in trade policy making. Agricultural Adjustment Investigations are conducted primarily to determine if agricultural goods are being imported in such quantities and under such conditions as to interfere with programs of the Department of Agriculture. The President requests such investigations and has the authority to restrict the imports in question by imposing fees or quotas. Unfair Trade Practices Investigations deal largely with patent violations by foreign nations. (Actually, the statute states very generally that investigations are carried out to determine whether "unfair methods of competition or unfair acts are occurring in the importation of articles into the United States," but historically this law has dealt mostly with property rights cases and the violation of patents.) Petitions are filed by firms or by the ITC itself. The ITC has the power to exclude the articles under investigation but the president may disapprove of their action within 60 days and cancel their order.

These first three investigations--general purpose, agricultural adjustment, and unfair practices--will not be dealt with further, since they are not direct avenues through which industries can seek protection. The latter three statutes--escape clause, antidumping, and countervailing duty--do allow industries themselves to seek relief from foreign competition; thus these three statutes will be considered in greater detail.

Escape Clause:

Escape Clause proceedings began in 1947 in response to the formation of GATT. The Escape Clause allowed members of GATT to withdraw from any reciprocal trade agreement which caused "injury" to a domestic industry. In 1951 Congress established criteria for the ITC to follow in determining injury; injury included such things as downward trends in production, employment, wages, prices, profits, or sales, and increases in inventories, imports, or market share of foreign imports. Congress continued to expand the criteria for dealing with

Escape Clause injury over the years to include "all relevant economic factors." These investigations and matters directly related to them took up a good deal of the Commission's time and resources in its early years. But the stringent injury requirement of the period from 1962 to 1974 limited the Commission's case load in these years. In 1975, there was a resurgence of Escape Clause cases but the number has dwindled again in recent years.

By statute, the ITC conducts Escape Clause investigations upon its own initiation, upon request of a firm, an industry representative, a group of workers, or by requests from Congress or the President. The ITC has six months in which to carry out its investigation to determine whether a particular good is being imported in such quantities as to injure or threaten the domestic industry. Under plurality rule, if the Commissioners vote against the petitioner, no action is taken. If they vote that injury has indeed occurred, then they must make a recommendation for relief to the president. The president then has discretion to implement their recommendation, to impose his own form of relief for the industry, or to ignor the recommendation for granting relief.

Relief can be in the form of an increase in tariff duties, quantitative restrictions (quotas), negotiated agreements, or adjustment assistance in loans, tax breaks, or the like to the petitioners. If the president's solution differs from that recommended by the Commission, Congress has the authority to overrule the president. From 1951 to 1983, the presidential veto of an ITC decision could be overturned by a simple majority vote in Congress. However, since the congressional veto was ruled unconstitutional in 1983, Congress now must pass a joint resolution (a majority vote in each House) to overturn the President's decision. This joint resolution is subject to a Presidential veto which Congress can override with a two-thirds vote in both chambers. A number of years (as specified in the final decision) after relief has been imposed, the ITC conducts a follow up investigation to determine whether the elimination of

that relief would cause harm in the future to the industry in question (see Diagram 1). Escape Clause proceedings have been an important part of trade legislation since Congress began delegating its authority to make tariff adjustments.

Antidumping:

Antidumping Investigations began in the Treasury Department under the Antidumping Act of 1921. Dumping is the act of selling goods to a foreign country at less than their home market cost of production. Investigations were carried out to determine whether industries were being injured by these practices. In 1954, Congress gave the ITC final decision making power on dumping cases. The Treasury Department continued to conduct its investigations, but then turned its findings over to the ITC for the final decision. Then in 1979, the Commerce Department took over the Treasury Department's investigative role.

Under the present law, preliminary petitions are filed with both the ITC and the Department of Commerce by individual firms, industry representatives, associations of firms, workers' groups, or unions. The filing of the petition triggers investigations in both bodies. The ITC has 45 days in which to make its initial decision as to whether the Commerce Department should continue its preliminary investigation. If the ITC rules against the petitioners in the preliminary stage, no action is taken. If the ITC rules for the petitioners, the Commerce Department continues the investigation and makes its preliminary ruling within 160 days. If Commerce initially rules against the petitioners, then it conducts a second investigation (within 235 days of the original filing of the petition) which either ends the case or, if it rules for the petitioners in this final proceeding, sends it back to the ITC for its final investigation. If Commerce initially rules in favor of the petitioners, then the case goes directly to the ITC for its final investigation. In the former case, the ITC has 45 days to make a decision, and in the latter case, the ITC has 120 days to rule on the case. A negative final decision by the ITC will end

the case. A positive final decision means the petitioner has won, and the Secretary of Commerce imposes a dumping duty equal to the amount by which foreign market value exceeds price on the imported good. Finally, if preliminary decisions are positive, bonds must be posted on imports until a final decision is reached (see Diagram 2).

Countervailing Duty:

The final area of investigation involving the ITC that will be dealt with here is the case of Countervailing Duty Investigations. A countervailing duty is a duty imposed on imported goods to counter subsidization which takes place in the foreign market. The ITC became involved in these inquiries under the Trade Act of 1974. As with the Antidumping cases, the Treasury Department carried investigations in conjunction with the ITC until 1979 when Commerce took over the Treasury Department's role. Since 1979 the procedure has been exactly the same as that of the Antidumping Investigations. Petitions must be filed with both the ITC and the Department of Commerce. Those groups who are eligible to petition are the same as those for dumping cases and the procedure following initiation of a case is identical to Antidumping Investigations. Injury to the petitioner is granted when the ITC and Commerce rule that the goods under study have been subsidized in their production by the home country. If the case receives a positive ruling, the Secretary of Commerce imposes a duty equal to the subsidy amount as determined by the ITC in its investigation.

The goods for which industries seek protection through the ITC represent a wide variety of products--from clothespins and plastic animal identification tags to steel products and automobiles. The process is often long and seemingly costly, yet many industries and even small individual firms find the effort worthwhile, as is apparent from the number of yearly petitions. Yet how much do we or firms know about their probability of success in seeking protection, or the factors involved in the decisions of policy makers? The next chapter reviews

developments in the literature on trade and the ITC in trying to understand the regulation of trade in the United States.

DIAGRAM 1

ESCAPE CLAUSE REVIEW PROCESS

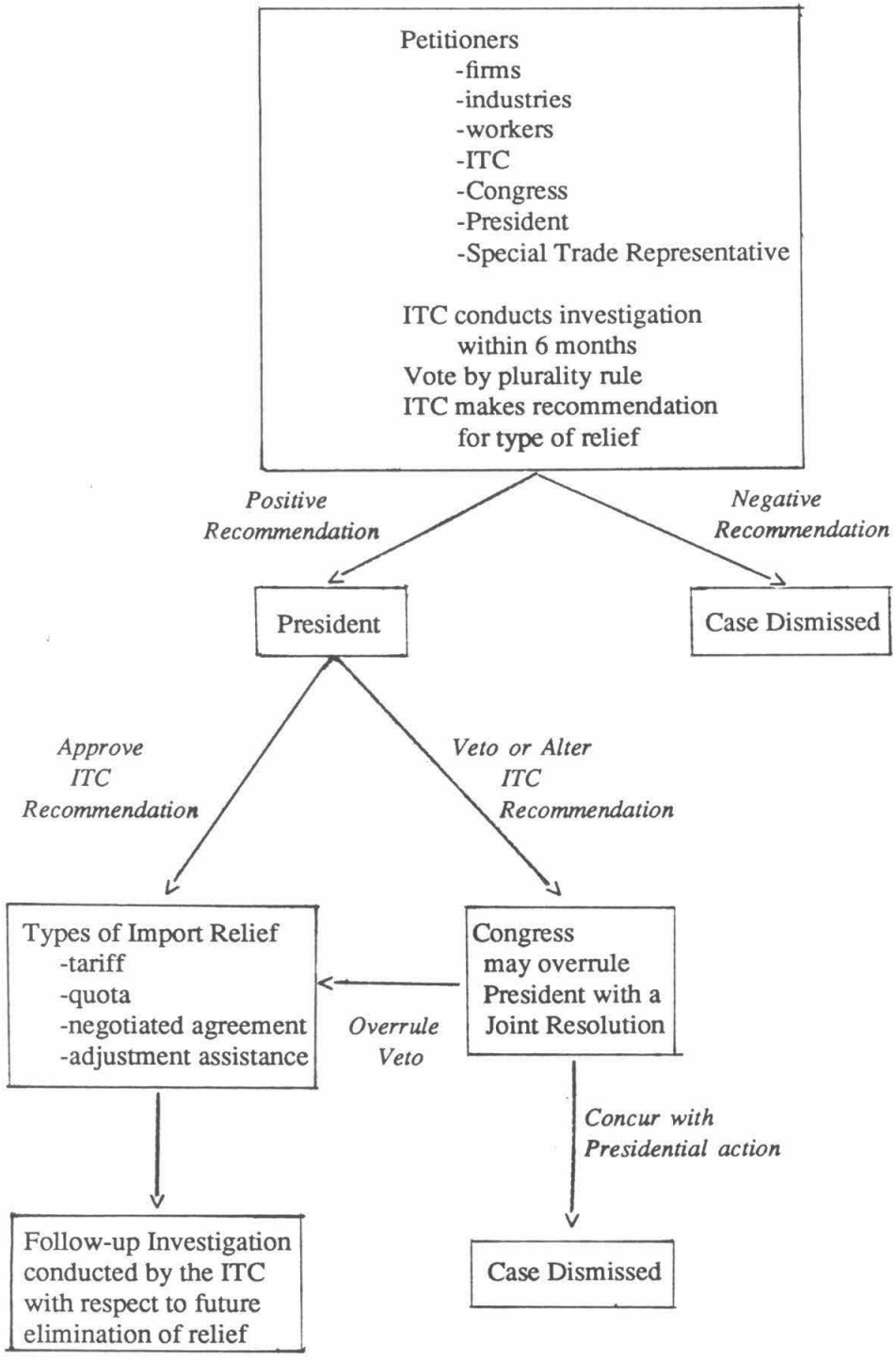
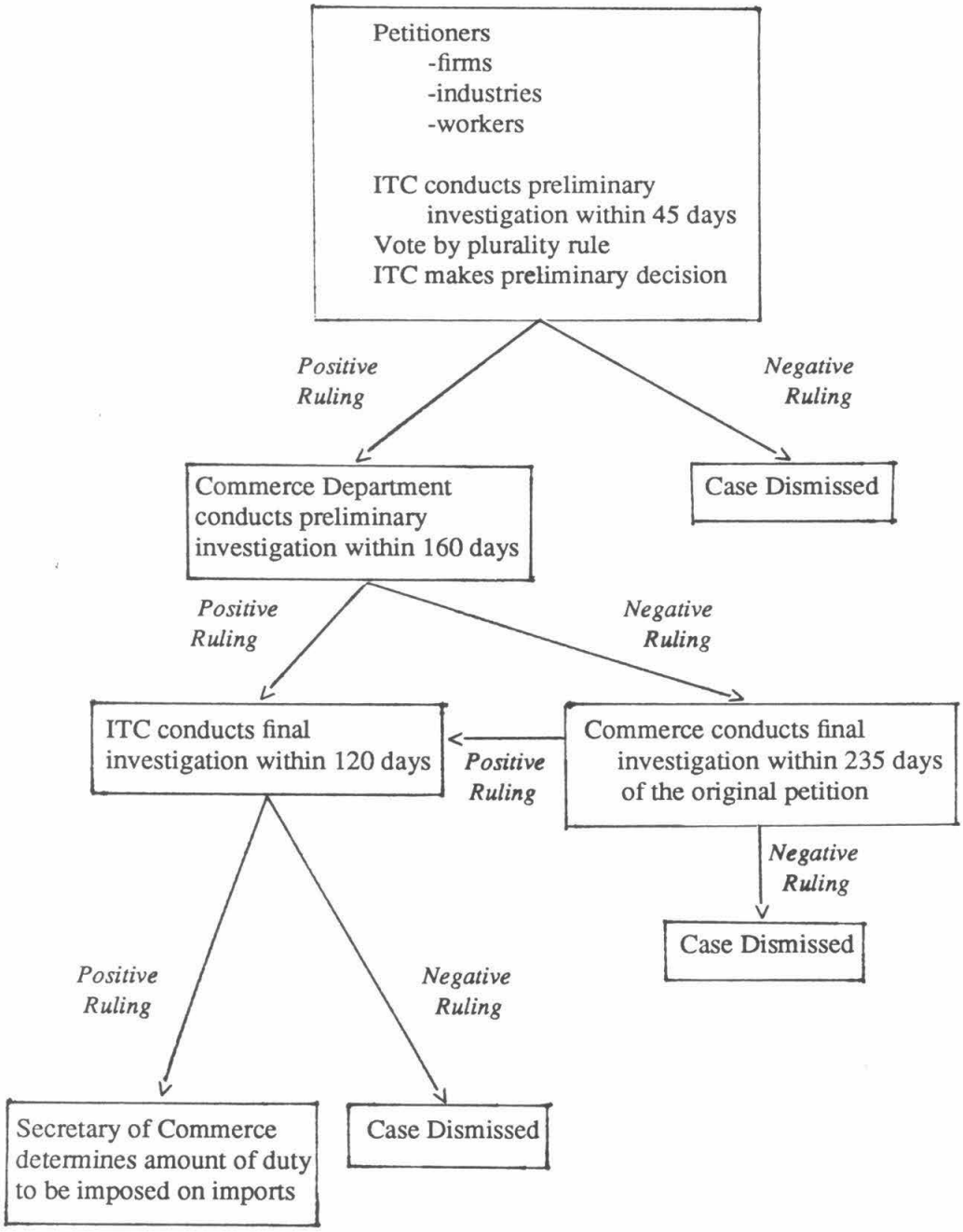


DIAGRAM 2

ANTIDUMPING
or
COUNTERVAILING DUTY REVIEW PROCESS



CHAPTER 2: LITERATURE REVIEW

Tariff policies have been studied for decades. An extensive literature exists which attempts to explain historic levels of protectionism and changes in those levels over time. However, these studies, containing conflicting results and diverse methodologies, have left unanswered questions and offer results that can be challenged.

Theories on Protectionism and Tariff Rates in the U.S.

One of the earliest studies of tariff policies was Schattschneider's (1935) pioneering work, which concentrated on the 1930 Smoot-Hawley Trade Bill. His study was an attempt to explain tariff rates as a product of one-sided pressure politics. He claimed that the public hearings on setting tariff rates were biased in favor of protectionism and that opposition was unorganized and uninformed. He concludes that the upward revision of tariffs by Congress was the result of protectionist political influences on congressional decision making. Bauer, Poole, and Dexter (1963) disagreed with this notion somewhat in that they believed that interests other than pure rational self-interest, like attitudes toward internationalism and man's role in business and society, are operating in the making of trade policies.

Both of these works, however, tend to slight the institutional context of policy making. Schattschneider, in particular, concludes that political interest groups in society are bad because pressure group politics resulted in "bad" public policy. However, it may be the case that the upward revision of tariffs in the 1930s was a result of congressmen satisfying their own personal goals of reelection by granting widespread protection. By looking at the making of trade policy in its institutional setting, where the rules governing the actors and the goals of the

actors themselves are considered, perhaps we can better understand the outcomes we observe.

Some of the earliest empirical literature on protectionism in the U.S. focused on the relationship between U.S. tariffs and labor intensity. It was concerned with the question of whether U.S. trade policies tended to protect labor in manufacturing industries. These works rested on the intuition of the Stolper-Samuelson Theorem (1941) that protectionism tends to favor the factor of production used relatively intensively by an industry. Studies, (e.g. Vaccara's, 1960) found evidence that tariff rates in the U.S vary positively with labor intensity. Based on these findings, Travis (1964) argued that the Leontief Paradox (1954)---that U.S. exports are more labor intensive that U.S. imports---could be explained by U.S. trade policies. By restricting the import of labor intensive goods from the U.S. market, one could explain the findings that U.S. import-competing industries were more capital intensive and export-competing ones more labor intensive. Under free trade conditions, the Hecksher-Ohlin Theorem (1919) maintains that labor intensive imports should increase relative to capital intensive imports because of the comparative advantage of the U.S. in capital intensive industries. So U.S. tariff policies were said to be responsible for the seemingly contradictory patterns of trade.

Attempting to test the Hecksher-Ohlin Theorem, Leontief observed that the United States had more capital per worker than its trading partners, and therefore, it must export capital-intensive and import labor-intensive commodities. His empirical findings, however, contradicted this hypothesis. Travis then presented evidence that he believed showed that the tariff policies of the U.S. fit the Leontief Paradox exactly. He found in the 1960s that manufactured goods which were relatively labor-intensive had the highest tariffs and that, because of this high degree of protection, it only appeared that U.S. imports were more capital-intensive. Furthermore, evidence indicated that exports were highly sensitive to reductions in tariffs,

which led Travis to conclude that if the excessive tariffs on labor-intensive goods were reduced to a reasonable level, imports would increase dramatically.

Baldwin (1971) also argued this point stating that, if all trade regulations were removed, the capital intensity of import-competing industries in the U.S. would probably go down. However, Baldwin also stressed the simplicity of the Hecksher-Ohlin Theorem as the most probable reason for its apparent contradiction with observed trading patterns. He maintained that the nature of the labor force, technological differences, transportation costs, and other factors need to be included in the study of trade patterns.

A number of studies that followed cast doubts on Vaccara's and Travis's findings. For example, Cheh (1976) and Basevi (1966) found evidence refuting the claim that the U.S. protects labor intensive industries. In particular, by considering both tariff and nontariff rates of protection for 1964, Cheh found no significant relationship between protection and the labor intensity of U.S manufacturing industries, while Basevi claimed that including the tariffs on the inputs of manufactured goods reversed the relation between protection and labor intensity.

Many modern empirical studies, however, suggest that unskilled labor intensive industries in the U.S. do receive more protection (see for example Magee, 1972 or Clark, 1980). By dividing labor into groups of skilled and unskilled workers, they found that protectionism is biased toward unskilled labor intensive goods. But this has been an ongoing debate in the literature.

Theories of the Supply for and Demand of Trade Regulation

Attention turned next to industry-specific variations in levels of import protection. A body of work on cross-industry studies attempted to identify more general determinants of the regulation of trade. A majority of this literature focused on various characteristics of the

demand for protection or the supply of protectionist measures, or both.

On the demand side, firms, industries, and workers, desiring to maximize their earnings, seek relief from import competition through bureaucratic and legislative processes. On the supply side, protection is awarded by the ITC, the Commerce Department, Congress, and the Executive who determine by political and/or economic criteria which industries will be granted import relief. The following body of literature is composed of scholars' attempts to predict equilibrium tariff rates with a variety of supply- and demand-side variables.

On the demand side, Pugel and Walters (1985) attempt to predict demand for protection by examining the behavior of U.S. corporations with respect to trade policy initiatives in the 1970s. They hypothesize that a company will be biased toward protectionism if it faces pressure from import competition, does not benefit from access to foreign markets, and is unable to adjust to increases in import competition. Their dependent variable is company positions on trade policy issues derived from survey questions sent to the Fortune 1000 industrial corporations in 1980. Explanatory variables used to test the hypotheses were initial tariff rates, increases in import penetration, the ratio of research and development expenditures to sales, and an index of product diversification. Their results indicate that a firm's position on trade protection is significantly determined by competitive pressures.

Potential problems with these results stem from the manner which the companies' positions on trade issues were determined. A sample of only 147 of the 1000 companies responded to the questionaire, of which only 68 were useable, creating possibilities of severe sample bias. Further, the information elicited by the questionnaire may be invalid due to interpretational differences by the firms. Firms selected a number between one and five to indicate their positions on various protectionist measures. But because of the nature of the response choices, firms may interpret the scale differently, thus distorting the information they

provide.

Pincus (1975) develops a supply oriented pressure group model to test the effectiveness of interest groups in obtaining tariffs. His dependent variable is the tariff rates set by the Tariff Act of 1824. For explanatory variables, he identifies a number of cross-industry factors that affect a group's ability to influence policy makers, namely Congress. These include a measure of size by industry output, their 1820 tariff rates, the number of establishments, concentration, proprietorial income share, sales dispersion by state, production dispersion by county, and number of senators with the industry in their districts. His results indicate that an industry's tariff rate is significantly determined by how successful the group is at producing political pressure. That is, success is determined by a group's costs of organization, homogeneity, size, and the like.

Pincus's results, however, are not generalizable and may by overstated because he fails to consider the political context surrounding the making of tariff policies in the 1820s. Evidence from the Congressional Debates on the tariff acts of the 1820s suggest that political maneuvers on the part of members of Congress and Executive policy makers resulted in higher tariffs being granted to industries that did not even seek such protection (see also chapter 2 of Taussig, 1966). Thus it is not clear that his estimations correctly predict interest group success in pressuring for policy outcomes.

Caves (1976) tests three different models in an attempt to explain cross industry variations in tariff rates in Canadian manufacturing industries. One model postulates that governments act to maximize the probability of their reelection. A second postulates that government action reflects a collective nationalistic preference. Finally, the third, for which Caves finds the most support, is an interest group model in which he claims that the granting of protection is based on the costs and benefits faced by industries and their incentives to organize. Among the

explanatory variables used are industry concentration, percentage of sales made by an industry to other industries, growth in value of shipments, and value added per worker. Though Caves finds support for his pressure group model, Helleiner (1977) finds evidence that contradicts many of his results by imposing a different set of variables to explain the same hypotheses put forth by Caves.

Godek (1985) attempts to predict the relationship between industry characteristics and protectionism, measured by tariff and quota restrictions on the trade of manufactured goods. He also postulates a pressure group model which identifies factors that influence the efficiency of industries in lobbying for trade protection. He uses measures of size, geographic concentration, the number of firms, and consumer expenditures to predict levels of tariffs and quotas for 1970 and finds evidence that the nature of industries, as pressure groups, influences patterns of trade restrictions.

Godek claims to explain incentives for industries to demand protection by using the average wage in the industry to account for the comparative advantage of the U.S. in exports which are capital and skilled labor-intensive. A higher average wage implies more skilled labor exists in the industry, which should be negatively correlated with demand for protection. But it is not clear that a low average wage is a good measure of demand for protection in 1970, and certainly this notion is not generalizable for the 1980s. With the rise of skilled labor industries in the Third World, wage level may not be a good indicator of U.S. industrial demand for protection. Further, Godek assumes that industries are free to petition, on any grounds, for any manner and extent of trade restrictions, and that bureaucratic and congressional action has no bounds; that is, he ignores the costs to industries of demanding protection and the rules and institutional constraints on the supply of protection.

Anderson (1978 & 1980) seeks to predict the levels of rates of assistance to rural and manufacturing industries in Australia. His work is innovative in that he attempts to capture all forms of assistance to both import and non-import competing industries by identifying factors that affect both the supply and demand for government assistance. On the demand side, Anderson uses variables for labor intensity measured by average wage, lobbying pressure measured by number of firms, industry decline measured by change in employment, and concentration of output. For the supply variables, he uses number of employees in the industry, average wage, geographic concentration, and finally, the share of imports and exports in domestic sales to measure whether there is a bias toward imposing tariffs and not granting export subsidies. The hypothesis is that the government should be more willing to grant tariffs which raise revenues than offer subsidies which deplete treasury resources. He concludes from his regression analysis that Australian industries that are more likely to be protected are labor-intensive, low wage, highly concentrated, high in total employment, and are not export-oriented, though he cannot conclude from his results that import-oriented industries receive more protection.

Finally, Ray (1981) develops a cross-industry model to determine levels of protection and tests it against tariff and nontariff barriers in the U.S. for 1975. His central thesis is that trade restrictions are consistent with profit maximization across industries. Ray finds that protection in the form of tariff and nontariff barriers is biased toward industries in which the U.S. is at a comparative disadvantage in world trade. However, he finds a discrepancy between other factors in explaining tariff and nontariff barriers. He concludes that tariffs are unrelated to concentration and geographic distribution of production facilities, while nontariff barriers are most prevalent in less concentrated industries and ones in which production facilities are dispersed across regions of the U.S. Ray also finds that nontariff barriers are more prevalent in

industries that already have higher tariff rates, implying that nontariff restrictions rather that additional tariffs have been granted to already protected U.S. industries.

His findings that trade barriers are greater on products in which the U.S. has a comparative disadvantage lends support to his hypothesis that trade restrictions are consistent with industry profit maximization, since there is little to gain from protecting an industry in which the U.S. has the advantage. Ray also uses a measure of product differentiation as a proxy for deadweight production and consumption costs by assuming that elasticity of demand is reduced by product heterogeneity. However, the expected positive correlation of trade restrictions and product differentiation did not bear out in his analysis. Thus his assumption that loss of social welfare will be minimized by governmental action on trade policy was not supported.

The literature presented thus far, which seeks to explain levels of tariff and nontariff barriers to trade by exploring factors which affect the supply of and demand for regulation, provides much insight into the understanding of protectionism. Though not free from problems, these works provide a sound base for studying the regulation of trade in the U.S. In addition to these works, scholars have recently become interested in the International Trade Commission and its role in the making of trade policy. The objective of many of the studies of the ITC has seemingly been to determine fluctuations in pressure and whether or not protectionist pressures have had an effect on U.S. policy. I will now discuss the body of literature specifically related to the ITC, explore a number of problems, and seek ways of improving on the works discussed.

Theories of Regulation by the ITC

Goldstein (1986) examines ITC activity to see whether the agency has become more or less protectionist over time. She claims that scholars have focused on the demand for

protection, and not on the supply, or the actual amount that has been imposed; she refutes the proposition that protectionism has been increasing in the U.S. Goldstein looks at the acceptance rate of ITC petitions from the 1950s to the present and concludes that it has not changed significantly over time. She claims from these results that policy is determined by the state's central decision makers and that the U.S. will become more protectionist only if their beliefs and attitudes change. Mere protectionist pressures, she claims, will not change the policy of the state.

Though Goldstein finds that the acceptance rate of petitions for protection has not increased over time, it is important to point out that this does not imply that protectionist pressures have not had an effect on policy makers. Perhaps the more interesting question is which petitions have been successful; that is, to whom have the protectionist favors been granted? This question will by addressed in the following chapters.

Lenway (1985) comes to a similar conclusion as Goldstein, that pressure groups have little influence on trade policy. Her claim is that GATT, the General Agreement on Trade and Tariffs, is the constraining force for U.S. policy makers. Her work is a case study of the textile, auto, and telecommunications industries. For each industry, she looks at whether or not they have gotten the protection that they have sought from the ITC, Congress, and Executive policy makers. She measures the success of pressure groups by whether or not they get the protection that they seek. She concludes that policy makers evaluate claims in the context of the GATT and only give in to protectionist pressures and grant relief when it falls within those guidelines. However, there is a danger in her judging the success of pressure groups by measuring the difference between what they ask for and what the government is willing to grant. If the government responds to protectionist petitions by granting only a percentage of what is requested, industries will surely overstate their claims and demands which may lead to

a conclusion that policy makers are very much in favor of free trade despite the fact that protectionism continues to flourish in the U.S.

Takacs (1981) tests whether the demand for protection is determined by aggregate economic activity in the U.S. Pressure for protection is measured by the number of Escape Clause petitions filed with the ITC by firms or industries between 1949 and 1979. A number of explanatory variables are used in her study. Aggregate economic activity is measured by the unemployment rate, gross national product, and capacity utilization in the U.S. The international competitive position of the U.S. is measured by the trade balance and import market share. Also included as an explanatory variable is the influence of the number of prior successful cases in the petition process on the demand for protection. Finally, Takacs accounts for legislative changes with dummy variables for the 1962 and 1974 Trade Acts. The results confirm Takacs' hypothesis that protectionist pressure is determined by the cyclical state of the economy and its competitive position vis'-a-vis' the the rest of the world.

Takacs goes on to estimate the supply of protection using the number of successful petitions as the dependent variable and explanatory variables identical to those used to estimate the pressure for protection. Here she finds that the number of successful cases is not significantly related to economic activity, which she claims is evidence that the government does not necessarily respond to protectionist pressures.

Though her results are significant, Takacs' work has several problems. First, she ignores all firm or industry specific characteristics and incentives for seeking protection from the ITC. Second, by measuring ITC activity only on the Escape Clause cases, excluding Countervailing Duty and Antidumping cases, she may not really be measuring demand for protection, since firms have alternative means of seeking action from the ITC. (She admits this may be a problem, but states that she got insignificant results by including these other types of cases

in her analysis.) Third, though she tries to account for legislative changes in the requirements for protection under the Escape Clause, she does not include both of the legislative dummies for the 1962 and 1974 Trade Acts in any single equation. Further, because of a high degree of multicollinearity among the cyclical economic variables, GNP is the only variable included in each of her five regressions. Thus, her analysis seems rather as hoc and incomplete.

A more disaggregate cross-industry study on the ITC was done by Baldwin. Baldwin (1985) examines the political behavior of the ITC members by looking at their voting patterns on Escape Clause cases. He identifies economic and political variables in an attempt to explain ITC behavior. His dependent variable is the percentage of commissioners who found injury in cases filed between 1974 and 1983. His empirical results show that two variables, the ratio of net profits to sales and average annual percentage change in employment, are significantly related to these voting patterns; lower profit rates and higher unemployment in the industries appear to explain a significant percentage of the commissioners' affirmative votes. Also included in this regression were political variables such as party affiliation of commissioners, size of the industry, a dummy variable indicating congressional or presidential requests for the investigations, a dummy for geographic concentration of an industry in one or two states, and an industry location variable measuring the relation between an industry's location and a commissioner's regional professional background. None of these political or interest group variables were found to be significant in explaining ITC voting behavior. Baldwin concludes from this analysis that the ITC is not influenced by political pressures either form Congress, interest groups, or the President.

Though Baldwin's analysis and conclusions appear sound, his choice of variables do not adequately measure political influence in its institutional framework. Given that the ITC acquired its powers through delegation from Congress, it may be important to consider

congressional influence on ITC decision making. The only such variable that Baldwin includes in his study is the dummy variable for congressional requests. However, out of a total of 47 observations, the actual number of congressional requests is too small to make any conclusive findings. Secondly, industry location or concentration should be considered in relation not only to the commissioners' regional backgrounds, but also to those of congressmen. Assuming that Congress has some influence over agency behavior, it may be important to consider congressional factors more extensively in analyzing its political influence on ITC decision making.

Furthermore, Baldwin's choice of party affiliation of commissioners as a measure of political influence may pose problems. Though some generalizations are sound, it is difficult, if not impossible, to predict voting behavior on trade legislation by party lines. Though a Republican from a harbor town may favor free trade because a large portion of his constituents work on shipping docks or related jobs, a Republican from the Pacific Northwest, whose constituents consist largely of lumber workers, will probably favor protection from Canadian lumber trade. In general, using party affiliation to predict political positions on trade legislation may yield much poorer results than using it to predict some other types of legislation.

Finally, Shughart and Tollison (1985) test some empirical propositions developed by Peltzman (1976) about the behavior of regulatory activity over the business cycle. They focus on the activities of three regulatory agencies, one of which is the ITC. The dependent variable used in their regression to explain ITC activity is the number of investigations completed each year by the commission from 1926 to 1981. The explanatory variables include a measure for business conditions (one of either real GNP, unemployment rate, business failure rate, or excess capacity), the annual budgetary appropriations, dummies for legislative changes, and a linear time trend. Peltzman's hypothesis predicts that producer protection will be more

prevalent during recessions. Shughart and Tollison conclude from their regression that this business cycle hypothesis does quite well in predicting ITC activity; their results support Peltzman's hypothesis that the ITC provides more protection during business contractions.

Though their results appear to significantly predict ITC activity, their choice of measuring ITC behavior by the number of completed investigations may pose serious problems for the conclusions they draw. There is no good reason to assume, as they do, that the number of investigations conducted is an indication of the ITC's propensity to grant protection. What they really predict is producer demand for protection, not agency supply, which is what they claim to be measuring.

The broad body of literature presented here represents a significant attempt by scholars to explain the regulation of trade. Many factors are identified to explain the supply of and demand for protection, but problems are apparent in much of the literature. There are few comprehensive empirical studies and frequently, it is unclear whether the authors are measuring supply or demand, or some convoluted combination of the two. Secondly, the narrow focus of some of the studies leads to contestable conclusions.

The studies on the ITC, in particular, draw conclusions about the supply of regulation by the Commission without properly accounting for industry demand. Ignoring an industry's decision of whether or not to file an application for protection may result in a self-selection bias in the analysis of the supply of regulation. Self-selection will be a problem if an industry's decision to apply (or not) is affected by its perception of the likelihood of a positive ITC ruling.

In the following chapters, I draw heavily on this body of trade literature in an attempt to improve our understanding of protectionism. By looking at the behavior and incentives of both policy makers and industries, I seek to predict on a basis of domestic politics the factors

that best explain the supply of and demand for regulation; that is, which industries are more likely to seek protection and when is the ITC more likely to grant them that protection. My study revolves around a well known body of literature on pressure group competition for regulation. In the following chapters I identify and explain a pressure group model of regulation and then test this model using data on ITC decisions, while accounting for the problem of self-selection.

CHAPTER 3: THEORIES OF REGULATION WITH AN APPLICATION TO PROTECTIONISM

Regulation of the U.S. economy has become an important and controversial aspect of federal governmental activity. More and more administrative agencies have the power to regulate prices, entry of firms into an industry, and levels of production. Such intervention can involve large costs and benefits, and can have important consequences for the distribution of wealth in society.

Studies of regulation generally fall into three categories: 1) price and entry regulation of industries with competitive markets, 2) price and entry regulation of naturally monopolistic industries, and 3) regulation which deals with market failure in areas such as the environment, health, occupational safety, and product quality.[12] This study will focus primarily on the first category, industry regulation of competitive markets.

It is generally agreed that regulation of competitive markets creates economic inefficiencies. Yet many competitive industries continue to face price, quantity, and entry controls imposed by regulatory agencies of the government. Of particular interest in this study is regulation of internationally traded goods in the form of tariffs, quotas, and other types of non-tariff barriers. Barriers have been placed on a wide variety of imported goods which are also produced by U.S. industries. What are the effects, on industries and society, of imposing such trading barriers on these goods, and what criteria are used to determine which industries will be protected and which will not? Munger (1983), Tarr and Morkre (1984), Magee (1972), Mintz (1973), and many others have estimated the costs that various forms of protectionism impose

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12. Joskow, Paul L. and Roger Noll. "Regulation in Theory and Practice: An Overview." in *Studies in Public Regulation.* ed. by Gary Fromm. (Cambridge, MA: The MIT Press, 1981), p. 3.

on society. This work will be concerned mainly with the question of which industries are more likely to enjoy protective trade barriers.

It is assumed that industries seek regulation in order it increase their wealth. Barriers to trade not only create economic rents for the industries, but also provide revenue to the government which can be used to subsidize specific industries and workers being hurt by foreign competition. The question, then, is why are some industries protected when others are not?

In exploring the answer to this question, one needs to look at the incentives of the actors in the regulatory process. Which factors can explain industries' incentives to seek protection and which factors explain the regulatory agency's incentives to supply that protection? From existing trade and regulation literature, these factors will be identified and quantified in order to test the power of existing theories of regulation in explaining protectionism in the U.S.

In the broad field of competitive market regulation, two well known approaches have dominated the literature in recent years. The first is best known as the "capture" theory approach developed first by Stigler (1971), and further refined by others such as Peltzman (1976) and Becker (1983). The essence of the capture theories is that political groups compete amongst themselves for political influence and wealth by lobbying and applying pressure on the politicians or regulators. Regulators or politicians maximize their political support by choosing "optimum" interest groups as beneficiaries of regulatory policies. These models then posit a demand for and supply of regulation.

The second approach, known as the theory of "congressional dominance," includes the works of Shepsle (1979), Weingast (1981, 1984), Shepsle and Weingast (1984), Weingast and Moran (1983), and others. The bureaucracy here is no longer captured by interest groups; other institutions, particularly Congress, are given more attention. The basic tenets of this set

of theories is that Congress controls the bureaucracy through such things as oversight committees and control of the purse strings. Congress is thus a key institution in the distribution of regulatory benefits, a feature the capture theories lack. Here again there is a supply and demand for regulation; interest groups compete for benefits which are supplied by the regulatory agency, but now the agency is controlled by the will of Congress. Congressmen favor agencies that serve their constituencies and retaliate against those who do not by preventing career advancements, curtailing budget allocations, and controlling the appointment/reappointment processes.

These two approaches to the study of regulation comprise a literature which develops the strategies and goals of the actors in the regulatory process. In general, interest groups form to pressure politicians for regulation when they believe that they can derive some economic benefits larger than their costs of demanding that regulation. On the supply side, regulators, faced with the problem of choosing where to allocate the benefits among the many competing interest groups, seek to maximize their political support. This study will focus on the capture theory of regulation. An in-depth look at the capture theory literature provides a basis for testing both the political actions of regulators and the decisions of industries desiring protection.

Capture Theories

"The Theory of Economic Regulation" (Stigler, 1971) is a study of the supply and demand of regulation. Stigler's central theme is that regulation is sought by industries and is designed to operate for their benefit. He states four main policy outcomes that are sought by industries. The first is direct subsidies or cash payments. Stigler claims this is used only when elasticity of supply in the industry is low so that there will not be a tendency for new entrants

to dissipate the industry's gains by entering the market to claim a share of the subsidy. A second type of policy sought by industries is those that affect substitute and complementary goods. His example of this is that butter producers wish to suppress margarine and encourage production of bread. The third class of policies is price-fixing. Price controls which result in higher than competitive rates of return are desired. Finally, industries desire policies that control the entry of new firms into an industry.[13] This is especially true of firms that seek protection against foreign goods. As Stigler points out, the benefits of protection can be dissipated by the entry of new firms.

Stigler's theory says, in effect, that agencies or politicians that regulate industries are "captured" in that they respond to industry pressures for regulation. Optimal size is important in ensuring that the costs of regulation are not too large and the consumer opposition is not too strong; industries are most successful when their benefits are greater than their costs of producing pressure, and when costs to the opposition are small or dispersed.

Stigler claims that the benefits of regulation to an individual firm can have limitations; for example, the political influence of each firm, not just price and its proportion of output, may also determine the distribution of control by individual firms in a regulated industry. Furthermore, when an industry is granted regulation, the benefits to the industry generally fall short of the costs to society due to deadweight loss. According to Stigler, one would expect a democratic society to reject a request for regulation unless the industry controlled a majority of the votes in that society. Yet industries that are granted regulation most often make up a minority of the voting society.

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13. Stigler, George J. "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science,* 3: (1971), pp. 2-3.

Stigler explores the reason why such minorities are able to obtain regulation and "...employ the political machinery to their own ends."[14] He proposes that the political system is designed to implement all strongly felt preferences of majorities and many strongly felt preferences of minorities while disregarding weaker preferences of both. In regulating an industry, when the costs to the minority are dispersed among a large majority, it often does not pay for members of that majority to examine these costs or to act against them (Olson, 1965).

Applying Stigler's theory to tariffs, when deadweight loss to society due to granting a tariff to a single industry is small and costs of the tariff are dispersed, the political system favors the strong preferences of the minority--if that minority has political power or access to the political system. Stigler also claims that larger industries seek regulation that costs society more and thus causes more opposition from affected groups. And industries that are too small need other advantages like concentration to ensure support. Thus size is an important factor in obtaining regulation; beyond a certain group size, there are diminishing returns to the benefits of regulation and higher costs of organization, but Stigler is not clear on where the cutoffs should be, or what the optimum size is for successfully obtaining regulation.

Finally, industries gain political power by providing "votes and resources" to the appropriate political groups in society. The industry supports the political agents who provide them regulation. Stigler treats this as a natural part of the system or political process.

Peltzman formalized Stigler's ideas and hypotheses in "Toward A More General Theory of Regulation" (1976). He assumes that regulation results in a transfer of wealth: the beneficiaries of regulation pay the regulators (politicians) with votes and money to acquire their benefits, which come from a tax or tariff on the consumer. Peltzman further assumes that

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14. Ibid., p. 10.

the regulator seeks to maximize his voter support and uses money to mitigate the consumer opposition. According to Peltzman, the "critical" decision for the regulator is deciding the size of the group that he promises benefits to and the size of the taxed group.[15] The regulator seeks to maximize his support; formally, Peltzman defines the goal of the regulator to maximize a majority M, where

$$M = nf - (N - n)h$$

and

n = size of the beneficiary group

f = probability of the beneficiary group granting support

N = total number of potential voters

h = probability of those who are taxed generating opposition.

In summary, Peltzman believes that regulation is a device used by politicians (bureaucrats and members of Congress) to transfer wealth from politically weak members of society (taxpayers) to well-organized politically strong interest groups who court the income transfer with votes and campaign contributions.

Becker takes a viewpoint similar to Stigler's and Peltzman's in "A Theory of Competition Among Pressure Groups for Political Influence" (1983). It is this work that will be the focus of my empirical analysis and thus will be discussed in greater detail than the other theories, both here and in the following section. Becker's main theme is that government policies of regulation correct market failures while favoring the politically powerful. Subsidized groups and taxpayers compete for political influence. The outcome depends on the size of each

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15. Peltzman, Sam. "Toward a More General Theory of Regulation." *The Journal of Law and Economics,* 19: (1976), pp. 214-17.

group, their effectiveness in producing pressure, and the deadweight cost (inefficiency) of the taxes and subsidies. Becker claims that less inefficient policies are more likely to be adopted, i.e. supported by politicians, than more inefficient policies. By less inefficient, Becker means that given the size of the benefits to the subsidized groups, the deadweight loss is minimized.

Both Becker and Stigler believe that when a regulatory action benefits a certain group, that group should be able to obtain that action. Becker takes this notion one step further to claim that the action selected will be the one that is most beneficial to society, i.e., that provides the given transfer (benefit) with the least deadweight loss to society. Subsidized (regulated) groups that gain the most from the policies they seek (while causing the least harm to society) are the ones most likely to be successful in pressuring the political system to adopt their policies. Both Becker and Stigler assume that politicians and bureaucrats are "hired" (elected) by pressure groups to further these groups' interests and that they will be "fired" in subsequent elections if they do not pursue these goals.

Becker assumes that two homogeneous groups exist in society: the subsidized group (s) and the taxpayers (t). Group t is taxed an amount $n_t R_t$ and group s is subsidized an amount $n_s R_s$, where n_t is the number of individuals in group t and n_s is the number of individuals in group s. The amount of taxes actually available for transfer, however, is $n_t \mathrm{F}(R_t)$, where $\mathrm{F}(R_t)$ is a function of the taxes which incorporates the deadweight loss from the tax. It is assumed that $\mathrm{F}(R_t) \leq R_t$ since deadweight loss diminishes the total tax paid by group t. The actual total amount of subsidy raised is $n_s \mathrm{G}(R_s)$, where $\mathrm{G}(R_s)$ is a function of the subsidy which incorporates the deadweight loss due to the subsidy. It is assumed that $\mathrm{G}(R_s) \geq R_s$ where the deadweight loss accounts for the subsidy being less than the amount raised. Income is redistributed by the government away from taxpayers to subsidized groups.

The amount of tax imposed on t depends on its political influence function, I^t where $n_t F(R_t) = - I^t(p_s, p_t, x)$. The total tax is equal to the influence of the taxed group which is a function of the political pressure (p_s) exerted by s, the political pressure (p_t) exerted by t, and other exogenous factors (x). So the amount of tax that has to be paid depends on the taxed group's influence. The subsidy to s depends also on its influence function, I^s where $n_s G(R_s) = I^s(p_s, p_t, x)$ with p_s, p_t, and x defined similarly. Thus the amount of wealth transferred to the subsidized group depends on its influence. Further, it is assumed that the subsidy is equal to the taxes, $n_s G(R_s) = n_t F(R_t)$ so that the government balances its budget. Also, $I^s + I^t \equiv 0$, which means that the sum of their influence functions is zero since increased influence that raises the subsidy must be financed by higher taxes, hence a lower influence for the taxpayers. It is assumed that increased influence by one group lowers the influence of the other by an equal amount.[16]

Groups compete for political influence by increasing their political pressure on the government. This is done by spending time, money and energy on lobbying, getting votes, and other forms of political pressuring. Becker defines pressure functions for each group as $p_s = p_s(m_s, n_s)$ and $p_t = p_t(m_t, n_t)$ where n_i is the size of group i and m_i is the total expenditure of group i. Hence pressure depends on the size of the group and the amount of money it spends. Also, a_i is defined as the amount spent per individual on pressure, thus, $m_i = a_i n_i$. Becker further argues that groups will want to control any free riding which might result from regulation. They will also want to increase their pressure for some policy when that additional pressure will raise their influence (i.e. when an increase in p_i will significantly raise I). This

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16. Becker, Gary S. "A Theory of Competition Among Pressure Groups For Political Influence." *The Quarterly Journal of Economics*. Vol. XCVIII, (August 1983), pp.375-76.

comprises Becker's first proposition: groups that become more efficient at producing political pressure (by controlling free riding or just getting better at lobbying) will be able to raise their influence and thus raise their subsidies or reduce their taxes. That is, $(\partial I^s/\partial p_s) > 0$ and $(\partial I^t/\partial p_t) > 0$. Furthermore, the effectiveness of their pressure is determined by their efficiency at producing pressure relative to other groups, not their absolute efficiency, since each group's influence is a function of both p_s and p_t.

The net income of each member of s and t is defined by Z_s and Z_t where $Z_s = Z_s^o + R_s - a_s$ and $Z_t = Z_t^o - R_t - a_t$. Here Z_s^o and Z_t^o are the initial incomes of each member of the respective groups. Thus the net gain to each member of s from government redistribution is $(Z_s - Z_s^o)$ which is their income after redistribution minus their initial income. And the net loss to each member of group t from government redistribution is $(Z_t^o - Z_t)$ which is the taxpayer's initial income minus their income after paying taxes. Each group in Becker's model seeks to maximize its income with respect to the amount each individual must spend on pressure. That is, each group wants to maximize its income after redistribution. Thus, group i wants to maximize Z_i subject to the constraint of its political influence function, since its influence determines its subsidy or tax.

For the subsidized group:

$$Max_{\{a_s\}}\ Z_s \;=\; Max_{\{a_s\}}\ (Z_s^o + R_s - a_s) \quad subject\ to\ \ n_s\, G(R_s) = I^s(p_s, p_t, x).$$

Similarly, for the taxed group:

$$Max_{\{a_t\}}\ Z_t \;=\; Max_{\{a_t\}}\ (Z_t^o - R_t - a_t) \quad subject\ to\ \ n_t\, F(R_t) = -I^t(p_s, p_t, x).$$

These equations can be solved for the equilibrium values of a_s, a_t, p_s, and p_t.[17]

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17. See Becker's Mathematical Appendix, pp. 397-99 for details of his model.

Becker deals extensively with how deadweight cost affects pressure, taxes and subsidies. A higher deadweight cost means a reduction in the equilibrium subsidy. This higher cost diminishes pressure exerted by the subsidized group since the greater the deadweight cost of a tax is, the smaller the revenue left for the subsidy will be. On the other hand, a higher deadweight cost encourages pressure by taxpayers to reduce the subsidy because reducing their taxes has a correspondingly smaller effect on the available subsidy. That is, they can pressure for a reduction in taxes without worrying about increased opposition from the subsidized group. The pressure of the subsidized group is reduced. Thus subsidized groups have an "intrinsic disadvantage" when deadweight cost is high, which Becker claims may be partially overcome with optimum size or more efficient production of pressure.

Regulatory actions with higher efficiency have lower deadweight loss, so they yield a higher revenue, or subsidy, from a given tax. When deadweight loss is small and benefits are large with an action sought by the subsidized group, then this group has the advantage in affecting political outcomes. The subsidized group will exert more pressure than the taxed group and will get its policy adopted unless the taxed group becomes more efficient at producing pressure. Becker claims that these actions are much more likely to be adopted than actions with lower efficiency. Becker's model, then, predicts that the competition of political pressure groups produces more efficient outcomes.[18] So in correcting market failures, the government appears to favor the politically powerful because the competition among pressure groups leads to this result; competition produces the most efficient wealth transfers and methods of taxation.

Workers, Becker claims, may also be able to assist in the production of pressure, thus exerting influence and eliciting political support. For example, when imports result in layoffs

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18. Becker, pp. 383-84.

and reductions in earnings, tariffs or quotas on these imports may raise worker's earnings by more than the deadweight cost to society due to the protection. Thus, workers will be likely to participate in pressuring the government for regulation.

Finally, politically successful groups tend to be small relative to the taxpaying group; benefits to each member would thus be greater, since the costs would be distributed among the large group and the benefits concentrated in the smaller group. Furthermore, the most efficient methods of taxation are favored by both groups. More efficient taxation means less deadweight cost to society. Less deadweight cost means higher subsidies for the beneficiaries and a lower resistance from, or production of pressure by taxpayers. Taxpayers will be less inclined to spend time and money to produce pressure if the amount raised can be contained through efficient means of taxation. Taxpayers will be indifferent to how they pay a fixed amount of taxes, but the subsidized group will want to maximize its revenue--hence the need for maximum efficiency of the transfer policy.

Summary

The Stigler, Peltzman, and Becker papers all deal with the regulation of industries, the behavior of key actors, the purpose of the regulation, and its effects on these industries and on society in general. Stigler explains or rationalizes regulation as a tool of industries in seeking payments, entry limitations, price fixing, or the like. Peltzman formalizes Stigler's ideas and seeks to explain the behavior of regulators (politicians) in responding to well-organized, powerful political groups in society that seek the benefits of regulation. The regulators seek to maximize their political support by choosing the optimum size group of beneficiaries and taxpayers. Finally, Becker argues that regulators behave efficiently by showing that in correcting market failures, they choose the outcome that is most efficient (i.e. that which provides a given benefit to the subsidized group with the least deadweight loss to society).

Becker's Pressure Group Model

Since the Stigler, Peltzman, and Becker models all deal with very similar concepts and properties of regulation, this section will focus on a single model, namely the Becker model. From his political equilibrium conditions, Becker derives comparative static properties which are crucial to the statement and understanding both of his propositions and the hypotheses that will be tested. First I will restate the Becker model and the conditions needed to derive his comparative static properties; then, using these properties, I will go through the proofs of the propositions relevant to this work, which will later be tested.

Given the specifications described in the previous section above, the subsidized group must solve the problem:

$$Max_{\{a_s\}} \ (Z_s^o + R_s - a_s) \ \ subject \ to \ \ n_s \ G(R_s) = I^s(p_s, p_t, x).$$

where R_s is implicitly a function of a_s, a_t, n_s, n_t, and x.

The taxed group is faced with a similar problem,

$$Max_{\{a_t\}} \ (Z_t^o - R_t - a_t) \ \ subject \ to \ \ n_t \ F(R_t) = -I^t(p_s, p_t, x).$$

where R_t is also defined as a function of a_s, a_t, n_s, n_t, and x. Recall the following properties of Becker' model:

$Z_i^o \equiv$ initial income of group i , $i \in \{s, t\}$
$R_s \equiv$ subsidy to each member of group s
$R_t \equiv$ tax on each member of group t
$n_i \equiv$ size of group i
$a_i \equiv$ expenditures per member of group i
$p_i = p_i(m_i, n_i)$; $m_i = n_i \ a_i$

$\frac{\partial p_i}{\partial m_i} > 0$ for group i, since Becker assumes that pressure increases when expenditures increase.

$$F(R_t) \leq R_t \; ; \; F' \leq 1, \; F'' \leq 0, \quad \text{where } F' \equiv \frac{\partial F}{\partial R_t} \quad \textit{and} \quad F'' \equiv \frac{\partial^2 F}{\partial R_t^{\,2}};$$

$$G(R_s) \geq R_s \; ; \; G' \geq 1, \; G'' \geq 0, \quad \text{where } G' \equiv \frac{\partial G}{\partial R_s} \quad \textit{and} \quad G'' \equiv \frac{\partial^2 G}{\partial R_s^{\,2}};$$

$$n_s \, G(R_s) - n_t \, F(R_t) \equiv 0;$$

$$\frac{\partial I^i}{\partial p_i} > 0 \; ; \; \frac{\partial I^j}{\partial p_i} < 0 \text{ where } i \neq j; \quad i, j \in \{s, t\}, \quad \text{since } I^s \equiv -I^t.$$

Since Z_i^o is constant for $i \in \{s, t\}$, the first order conditions to the maximization problems yield,

$$\frac{\partial R_s}{\partial a_s} = 1 \tag{1}$$

$$\frac{\partial R_t}{\partial a_t} = -1. \tag{2}$$

Since the constraints imply that

$$n_s \, G' \frac{\partial R_s}{\partial a_s} = \frac{\partial I^s}{\partial p_s} \frac{\partial p_s}{\partial m_s} \frac{\partial m_s}{\partial a_s} \tag{3}$$

$$n_t \, F' \frac{\partial R_t}{\partial a_t} = -\frac{\partial I^t}{\partial p_t} \frac{\partial p_t}{\partial m_t} \frac{\partial m_t}{\partial a_t}, \tag{4}$$

the first order conditions can be rewritten as

$$\frac{\dfrac{\partial I^s}{\partial p_s} \dfrac{\partial p_s}{\partial m_s}}{\dfrac{\partial G}{\partial R_s}} - 1 = 0 \tag{1'}$$

$$\frac{\dfrac{\partial I^s}{\partial p_t} \dfrac{\partial p_t}{\partial m_t}}{\dfrac{\partial F}{\partial R_t}} + 1 = 0. \tag{2'}$$

Equations (1′) and (2′) can then be solved for the optimum per capita expenditures, a_s^*, a_t^* and the optimum pressures, p_s^*, p_t^* of each group.

Alternatively, using the implicit function theorem, (1′) and (2′) can be rewritten as:

$$\Psi_s(p_s, p_t, n_s, n_t) = 0, \tag{1″}$$

$$\Psi_t(p_s, p_t, n_s, n_t) = 0. \tag{2″}$$

Finally, by totally differentiating the system of equations defined by (1″) and (2″), Becker derives the comparative static properties needed to prove his propositions. Total differentiation with respect to p_s, p_t, and any arbitrary parameter α yields:

$$\frac{\partial \Psi_s}{\partial p_s} dp_s + \frac{\partial \Psi_s}{\partial p_t} dp_t + \frac{\partial \Psi_s}{\partial \alpha} d\alpha = 0 \tag{5}$$

$$\frac{\partial \Psi_t}{\partial p_s} dp_s + \frac{\partial \Psi_t}{\partial p_t} dp_t + \frac{\partial \Psi_t}{\partial \alpha} d\alpha = 0. \tag{6}$$

Letting $\frac{\partial \Psi_s}{\partial p_s} = a_{11}$, $\frac{\partial \Psi_s}{\partial p_t} = a_{12}$, $\frac{\partial \Psi_s}{\partial \alpha} = s_\alpha$, $\frac{\partial \Psi_t}{\partial p_s} = a_{21}$, $\frac{\partial \Psi_t}{\partial p_t} = a_{22}$, $\frac{\partial \Psi_t}{\partial \alpha} = t_\alpha$,

and

$$A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$$

then by substitution,

$$A \begin{bmatrix} \frac{dp_s}{d\alpha} \\ \frac{dp_t}{d\alpha} \end{bmatrix} = \begin{bmatrix} -s_\alpha \\ -t_\alpha \end{bmatrix}$$

By solving for $\frac{dp_s}{d\alpha}$ and $\frac{dp_t}{d\alpha}$ and determining the sign of both the matrix A and its components, Becker shows that

$$sgn \frac{dp_s}{d\alpha} = sgn\ s_\alpha \tag{7}$$

$$sgn\ \frac{dp_t}{d\alpha} = -sgn\ t_\alpha.^{19} \tag{8}$$

These properties will now be used to redo Becker's propositions.

Proposition 1 :

If a group becomes more efficient at producing political pressure, it will be able to raise the subsidy that it receives or reduce the taxes that it pays.

Becker assumes that an increase in a group's efficiency at producing pressure implies that $\frac{\partial p_s}{\partial m_s} > 0$ and $\frac{\partial p_t}{\partial m_t} > 0$, where p_i is pressure and m_i is expenditure for group i. He claims in Proposition 1 that an increase in efficiency will increase the subsidy to group s or decrease the taxes of group t. That is, $\frac{\partial R_s}{\partial p_m^s} > 0$ and $\frac{\partial R_t}{\partial p_m^t} < 0$ where $p_m^s \equiv \frac{\partial p_s}{\partial m_s}$ and $p_m^t \equiv \frac{\partial p_t}{\partial m_t}$.

Proof:

First, $\frac{\partial R_s}{\partial p_m^s}$ can be rewritten as

$$\frac{\partial R_s}{\partial p_m^s} = \frac{\partial R_s}{\partial p_s}\ \frac{\partial p_s}{\partial p_m^s}\ .$$

But from (1) above,

$$\frac{\partial R_s}{\partial a_s} = \frac{\partial R_s}{\partial p_s}\ \frac{\partial p_s}{\partial m_s}\ \frac{\partial m_s}{\partial a_s} = 1 \quad \Rightarrow \quad \frac{\partial R_s}{\partial p_s} = \frac{1}{p_m^s\ n_s}$$

where $\frac{\partial m_s}{\partial a_s} = n_s \equiv$ the size of group s, $n_s > 0$,

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19. See Becker's Mathematical Appendix, pp. 397-99.

and $p_m^s \equiv$ efficiency of group s at producing pressure, $p_m^s > 0$.

So $\frac{\partial R_s}{\partial p_s} > 0$.

Secondly, $\frac{\partial p_s}{\partial p_m^s} > 0$ because by equation (7), $\operatorname{sgn} \frac{\partial p_s}{\partial p_m^s} = \operatorname{sgn} s_{p_m^s}$

where $s_{p_m^s} = \frac{\partial \Psi_s}{\partial p_m^s}$.

Or,

$$s_{p_m^s} = \frac{\frac{\partial I^s}{\partial p_s} \frac{\partial p_m^s}{\partial p_m^s}}{\frac{\partial G}{\partial R_s}} > 0.^{20}$$

Therefore, $\frac{\partial R_s}{\partial p_m^s} = \frac{\partial R_s}{\partial p_s} \frac{\partial p_s}{\partial p_m^s} > 0.$

Similarly, using equations (2) and (8), it can be shown that $\frac{\partial R_t}{\partial p_m^t} = \frac{\partial R_t}{\partial p_t} \frac{\partial p_t}{\partial p_m^t} < 0.$

Proposition 2 :

An increase in the deadweight loss reduces the equilibrium subsidy to group s and increases the taxes of group t.

In Becker's model, deadweight losses for group s and group t are defined, respectively, as the costs of providing the subsidy and of imposing the tax. The functions $G(R_s)$ and $F(R_t)$ incorporate the deadweight losses so that,

$$G(R_s) \geq R_s$$
$$F(R_t) \leq R_t.$$

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20. See Becker's Mathematical Appendix, equation A.15.

If deadweight losses increase, this implies that $G(R_s)$ increases and $F(R_t)$ decreases. That is, $G(R_s)$ and $F(R_t)$ respectively get further away from the actual subsidy received, R_s, and the actual taxes paid, R_t. Proposition 2, then, states that $\frac{\partial R_s}{\partial G} < 0$ and $\frac{\partial R_t}{\partial F} > 0$.

Proof:

Show $\frac{\partial R_s}{\partial G} = \frac{\partial R_s}{\partial p_s} \frac{\partial p_s}{\partial G} < 0.$

From Proposition 1, we know that $\frac{\partial R_s}{\partial p_s} > 0.$

Secondly, $\frac{\partial p_s}{\partial G} < 0$ because by equation (7), $\operatorname{sgn} \frac{\partial p_s}{\partial G} = \operatorname{sgn} s_G$

where $s_G = \frac{\partial \Psi_s}{\partial G}$

Or,

$$s_G = \frac{\frac{\partial I^s}{\partial p_s} \frac{\partial p_s}{\partial m_s} \frac{\partial G'}{\partial G}}{\left[\frac{\partial G}{\partial R_s}\right]^2} < 0.^{21}$$

Therefore, $\frac{\partial R_s}{\partial G} = \frac{\partial R_s}{\partial p_s} \frac{\partial p_s}{\partial G} < 0.$

Similarly, using Proposition 1 and equation (8), it can be shown that

$$\frac{\partial R_t}{\partial F} = \frac{\partial R_t}{\partial p_t} \frac{\partial p_t}{\partial F} > 0.^{22}$$

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21. See Becker's Mathematical Appendix, equation A.16.

22. See Becker's Mathematical Appendix, equation A.17.

Becker's second proposition states that, the higher the deadweight loss of some regulatory action is, the lower the subsidy to s will be. So when deadweight loss is high, in order to collect a fixed amount of tax revenue for transferring to group s, additional taxes must be imposed to offset the high deadweight loss. This leads to Becker's corollary to Proposition 2.

Corollary 2 :

Policies that raise efficiency (i.e., have a lower deadweight loss) are more likely to be adopted than policies that lower efficiency.

Proof:

A lower deadweight loss (which implies lower G and higher F) encourages pressure by s and discourages opposing pressure by t, since by Proposition 2 $\frac{\partial p_s}{\partial G} < 0$ and $\frac{\partial p_t}{\partial F} < 0$. Thus, group s would pressure for a policy with a smaller deadweight loss, since this would increase the available subsidy. Group t, however, would reduce its pressure against such a policy, since lower deadweight costs would increase the tax revenue available for subsidies, which would potentially allow for an overall decrease in taxes. Thus both groups prefer more efficient policies.

Furthermore, group s is said to have an "intrinsic advantage" when $G' < F'$. This is because when the adoption of a policy results in $n_s R_s > n_t R_t$, or equivalently at the margins, $n_s dR_s > n_t dR_t$, then the efficiency is raised in favor of group s. But $n_s G(R_s) = n_t F(R_t)$, which implies $G' n_s dR_s = F' n_t dR_t$. So $n_s dR_s > n_t dR_t$ iff $G' < F'$. Therefore, $G' < F'$ is a necessary and sufficient condition for group s to have the advantage in pressuring for a certain policy. Furthermore, group s's advantage increases as deadweight loss decreases (i.e. G decreases and F increases, or equivalently G' decreases and F' increases) because p_s increases and p_t decreases, so s's influence goes up and t's influence goes down. (Recall $\frac{\partial I^s}{\partial p_s} > 0$ and $\frac{\partial I^s}{\partial p_t} < 0$.)

So group s will increase pressure to raise its subsidy.

On the other hand, a higher deadweight loss encourages pressure by t and discourages pressure by s because $\frac{\partial p_s}{\partial G} < 0$ and $\frac{\partial p_t}{\partial F} < 0$. Group s would not pressure for a policy with a larger deadweight loss because this would reduce its subsidy: $\frac{\partial R_s}{\partial G} < 0$ by Proposition 2. But group t would increase its pressure, since a higher deadweight loss decreases the amount of revenue available for transfer to s, which leads to an increase in taxes in order to provide a given subsidy to group s. Thus both groups are better off if the deadweight loss is smaller, i.e., policies are more efficient.

Group t is said to have an "intrinsic advantage" when $F' < G'$. This is because when the adoption of a policy results in $n_t R_t > n_s R_s$, or equivalently $n_t dR_t > n_s dR_s$, then the taxes being paid by group t are higher than the subsidy received by group s, so group t will have the advantage in pressuring against such policies. But $n_t dR_t > n_s dR_s$ iff $F' < G'$. So $F' < G'$ is a necessary and sufficient condition for group t to have the advantage over group s. Furthermore, group t's advantage increases as deadweight costs increase, because p_s goes down and p_t goes up; so t's influence goes up while s's influence does down. Thus group t will increase its pressure to prevent an increase in taxes.

In summary, Proposition 2 and its Corollary imply that a lower deadweight loss gives group s an advantage over t in influencing policy makers. So policies with a lower deadweight loss are more likely to be adopted. Policies with a higher deadweight loss, however, give group t an advantage over s in influencing policy makers. So policies with a higher deadweight loss are less likely to be adopted. Furthermore, policies with a lower deadweight loss increase the equilibrium subsidy. So Becker's model predicts that policies with a lower deadweight loss are not only more likely to be adopted, but also will be preferred by both group s and

group t because of their higher efficiency.

Proposition 3 :

Politically successful groups tend to be small relative to the size of the groups taxed to pay their subsidies.

An increase in the size of the taxed group (n_t) results in a decrease in pressure by group t because the tax per member will decrease. That is,

$$\frac{\partial p_t}{\partial n_t} < 0.$$

Proof:

By equation (8), $\quad \text{sgn}\ \frac{\partial p_t}{\partial n_t} = \text{-sgn}\ t_{n_t}$

where $t_{n_t} = \frac{\partial \Psi_t}{\partial n_t}$

Or,

$$t_{n_t} = \frac{\frac{\partial I^s}{\partial p_s}\ \frac{\partial}{\partial n_t}\left[\frac{\partial p_t}{\partial m_t}\right]}{\frac{\partial F}{\partial R_t}} - \frac{F\ F''}{n_t (F')^2} > 0.^{23}$$

So if a subsidy is financed by a larger group of taxpayers, the opposition will be smaller.

An increase in the size of the subsidized group, on the other hand, increases the pressure by group s as long as the group continues to become more efficient at producing pressure, (i.e. as long as $\frac{\partial R_s}{\partial n_s} > 0$; see Becker's footnote 12). So

$$\frac{\partial p_s}{\partial n_s} > 0.$$

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23. See Becker's Mathematical Appendix, equation A.19.

Proof:

By equation (7), $\operatorname{sgn} \frac{\partial p_s}{\partial n_s} = \operatorname{sgn} s_{n_s}$

where $s_{n_s} = \frac{\partial \Psi_s}{\partial n_s}$

Or,

$$s_{n_s} = \frac{\frac{\partial I^s}{\partial p_s} \frac{\partial}{\partial n_s}\left[\frac{\partial p_s}{\partial m_s}\right]}{\frac{\partial G}{\partial R_s}} + \frac{G\,G''}{n_s(G')^2} > 0.^{24}$$

So if the size of the subsidized group increases, its pressure will continue to increase until a point is reached where, because of the greater inefficiency of a large political group, the subsidy per member actually begins to decrease.

Protectionism and Becker's Model

Using his framework, Becker's model can be rewritten to facilitate the testing of his propositions in the context of industries seeking protection from the International Trade Commission. The ITC supplies subsidies, through the use of tariffs and quotas, to industries which seek such regulation. According to Becker, his model should predict which industries will be successful in pressuring policy makers for protection.

Assume, for ease of illustration, that the supply and demand equations are known to be linear for some consumer good, x.

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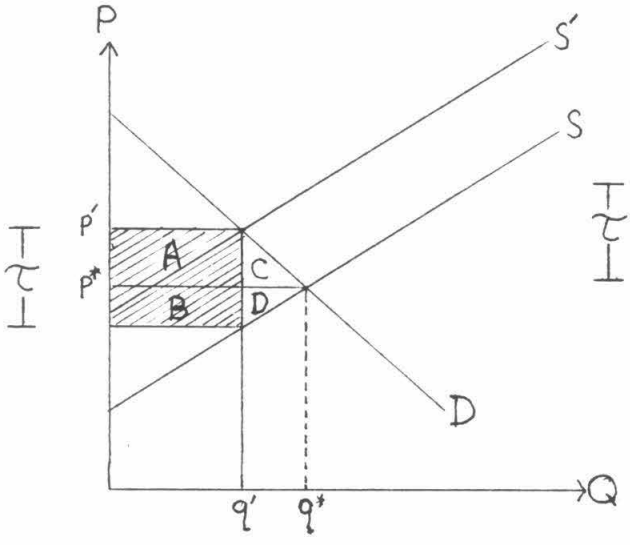
24. See Becker's Mathematical Appendix, equation A.18.

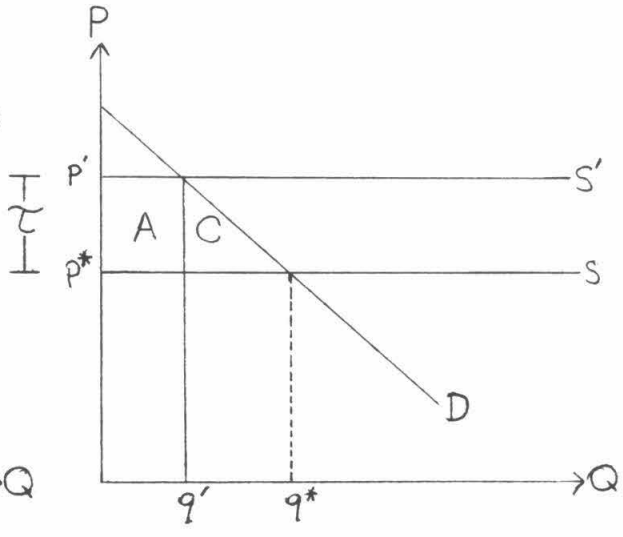
$$D(p) = a - bp$$
$$S(p) = c + dp$$

where $a, b, c, d, \geq 0$.



SHORT RUN SUPPLY AND DEMAND

Diagram 3



LONG RUN SUPPLY AND DEMAND

Diagram 4

In the short run (Diagram 3), if a tariff τ is imposed on x, the revenue collected by the government for redistribution is equal to the shaded area $(A + B)$. But the subsidized group loses the amount $(B + D)$ in producer surplus, while the taxed group loses the amount $(A + C)$ in consumer surplus. The area $(C + D)$, the amount lost in surplus but not collected by the government, is defined as the deadweight loss from the tariff policy. The size of the areas $A, B, C,$ and D are determined by the size of the tariff τ, the elasticity of demand ε_D, and the elasticity of supply ε_S of good x, where the elasticities of demand and supply are defined respectively as how the quantities demanded and supplied depend on a change in the price of x. So $A, B, C,$ and D are each defined as functions of τ, ε_D, and ε_S. That is,

$$A = A(\tau, \varepsilon_D, \varepsilon_S)$$
$$B = B(\tau, \varepsilon_D, \varepsilon_S)$$
$$C = C(\tau, \varepsilon_D, \varepsilon_S)$$
$$D = D(\tau, \varepsilon_D, \varepsilon_S).$$

The functions F and G from Becker's model can now be defined in terms of government revenues and deadweight loss, as described above by the functions $A, B, C,$ and D. Let

$$n_t F(R_t) = A + B = n_s G(R_s)$$

which satisfies the government's budget constraint, $n_t F(R_t) - n_s G(R_s) \equiv 0$. Taking into account the losses in consumer and producer surplus and the deadweight costs, the actual tax and subsidy are defined by,

$$n_t R_t = A + B + C$$
$$n_s R_s = A + B - (B + D) = A - D.$$

Note that $F(R_t) \leq R_t$ and $G(R_s) \geq R_s$ which are exactly the conditions of Becker's model.

I will assume in this work that the industries face competitive markets and have constant returns to scale in production, hence perfectly elastic long run supply curves (see Diagram 4); this presumes that the transfer and the deadweight loss depend only on elasticity of demand, not on the elasticity of supply. Note also that with flat supply curves, the areas B and D are each zero, but the conditions placed on $F, G, R_t,$ and R_s still hold. Thus, the areas A and C, which comprise respectively the total wealth transfer and deadweight loss, are determined only by τ and ε_D.

Given a fixed tariff rate τ, consider the affect of imposing τ on goods with different elasticities of demand. If ε_D increases (i.e. demand becomes more inelastic), then the wealth transfer A will always increase, while the deadweight loss C will always decrease, as long as

the demand curve crosses both S and S', or in other words, the tax is not so great as to result in zero demand. That is, $-\frac{\tau}{q^*} \geq$ *slope of* $D(p) \geq -\infty$. So the following conditions hold:

$$\frac{\partial A}{\partial \varepsilon_D} > 0 \tag{9}$$

$$\frac{\partial C}{\partial \varepsilon_D} < 0 \tag{10}$$

$$\textit{for } -\frac{\tau}{q^*} \geq b \geq -\infty, \textit{ where } b = \textit{slope of } D(p), \textit{ and } \varepsilon_D \equiv \frac{\frac{dq}{q}}{\frac{dp}{p}} = \frac{p}{q}\frac{1}{b}.$$

Pressure will be defined in terms of factors that influence the ability of each group to affect policy outcomes. For the industries seeking protection, their ability to influence policy makers will be a function not only of total group expenditures and size as in Becker's work, but also such factors as their concentration, unionization, and the number of firms involved in the petitioning process. Each of these is related in some sense to the costs of organization of an industry seeking regulation.

First, the industry will be more efficient at producing political pressure and securing a desired subsidy if its output from production is concentrated in a smaller number of firms. This is because an industry with a smaller number of firms should have lower costs of organization and thus be more efficient at producing political pressure. For example, an industry with one versus one hundred firms will be much better at coordinating actions and making decisions than the hundred-firm industry. So pressure will be a function of the degree of concentration in the industry.

A union may also have an effect on an industry's efficiency at producing political pressure. Unions are generally organized, and thus better at coordinating actions and making decisions. Freeman and Medoff (1984), among others, have found both that unions have been

successful in lobbying for policies that benefit workers as a whole and that legislators representing unionized districts tend to support unions' political goals.[25] Thus, unionization should have a positive effect on the ability of an industry to apply pressure on the political system.

Finally, a third factor which may affect an industry's production of pressure is whether or not firms pressure as a group. If a group of firms, which make up a significant proportion of an entire industry, lobbies together for regulation, they presumably have overcome the problems of organization and free riders. If there are too many free riders, the benefits will be so dispersed that it will not be worthwhile for a single firm to undergo the costs of applying pressure on the political system (Olson, 1965). Schattschneider (1935) and Key (1958) both find that American businesses have historically been well organized and, in small groups, have wielded a surprising amount of lobbying power.

The degrees of concentration, unionization, and free riding problems are, in some sense, all measures of the costs of organization which affect the efficiency of producing political pressure and securing desired political outcomes. Thus, the political pressure functions of s and t will be defined as follows:

$$p_s = p_s(m_s, n_s, c_s, u_s, f_s)$$
$$p_t = p_t(m_t, n_t)$$

where m_i and n_i are defined as before, and

$c_s \equiv$ concentration in the industry
$u_s \equiv$ unionization of an industry
$f_s \equiv$ number of firms involved in a petition.

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25. 1. Richard B. Freeman and James L. Medoff, *What Do Unions Do?* (New York: Basic Books Inc., 1984),pp. 192-200.

As discussed earlier, the goal of each group is to maximize its income (that is increase its subsidy or decrease its taxes) subject to the constraints placed on its ability to influence policy makers. The first order conditions to the maximization problems are identical to equations (1′) and (2′). These equations can now be solved for the optimum per capita expenditures a_s^*, a_t^* and the optimum pressures p_s^*, p_t^* of each group as before.

Alternatively, (1′) and (2′) can be rewritten as

$$\Psi_s \left[p_s(m_s, n_s, c_s, u_s, f_s),\ \ p_t(m_t, n_t) \right] = 0$$
$$\Psi_t \left[p_s(m_s, n_s, c_s, u_s, f_s),\ \ p_t(m_t, n_t) \right] = 0.$$

Or, using the implicit function theorem

$$\Psi_s\ (p_s, p_t, n_s, n_t, c_s, u_s, f_s) = 0$$
$$\Psi_t\ (p_s, p_t, n_s, n_t, c_s, u_s, f_s) = 0.$$

By totally differentiating this system of equations with respect to p_s, p_t, and any arbitrary parameter α, the comparative static properties can be derived as before.

Using this new characterization of Becker's model described above, we can now test the previous propositions using new variables which are relevant to the regulation of trade.

H1: Tariff policies that result in a larger subsidy and a lower deadweight loss are more likely to be adopted than policies that result in a lower subsidy and higher deadweight loss.

If demand for some consumer good x is very inelastic (i.e. ε_D is close to 0), then the deadweight loss from a tariff on x will be smaller than that from a tariff on a more elastically demanded good (see equation 10 above). Also, the more inelastic the demand, the higher the subsidy will be for a given tariff rate τ (see equation 9). Hypothesis 1 states that policies

granting higher tariffs on more inelastically demanded goods are not only more efficient than tariffs on goods with a more elastic demand, but also are preferred by policy makers, producers, and consumers. Producers pressure policy makers for higher subsidies, while consumers want lower taxes. The goal of policy makers is to maximize their voter support and minimize their opposition. By putting tariffs on goods with more inelastic demands, the policy makers can accomplish their goals and satisfy both producers and consumers.

In other words, on the producer side, given a fixed tariff rate τ,

$$\frac{\partial(n_s R_s)}{\partial \varepsilon_D} = \frac{\partial(n_s R_s)}{\partial A} \frac{\partial A}{\partial \varepsilon_D} > 0.$$

Proof:

Under the condition of long run perfectly elastic supply, $n_s R_s = A(\tau, \varepsilon_D)$. So $\frac{\partial(n_s R_s)}{\partial A} > 0$.

Equation (9) states that, $\frac{\partial A}{\partial \varepsilon_D} > 0$. Thus,

$$\frac{\partial(n_s R_s)}{\partial \varepsilon_D} = \frac{\partial(n_s R_s)}{\partial A} \frac{\partial A}{\partial \varepsilon_D} > 0. \qquad \text{Q.E.D.}$$

So producers should prefer that a given tariff τ be put on inelastically demanded goods, so that the available subsidies will be larger. (Note that this may be true regardless of the elasticity of demand on their own product, since producers will be concerned about not only the increase in producer surplus from the tariff, but also the transfer payments they may receive from the government out of the tariff revenue collected.)

On the consumer side, assuming the government wants to collect a fixed amount of revenue for transferring from consumers to producers (i.e. for a fixed subsidy A), then

$$\frac{\partial(n_t R_t)}{\partial \varepsilon_D} = \frac{\partial(n_t R_t)}{\partial C} \frac{\partial C}{\partial \varepsilon_D} < 0.$$

Proof:

Under the condition of long run perfectly elastic supply, $n_t R_t = A + C$. So for A fixed, $\frac{\partial(n_t R_t)}{\partial A} = 0$ and $\frac{\partial(n_t R_t)}{\partial C} > 0$. Equation (10) states that $\frac{\partial C}{\partial \varepsilon_D} < 0$. Thus,

$$\frac{\partial(n_t R_t)}{\partial \varepsilon_D} = \frac{\partial(n_t R_t)}{\partial C} \frac{\partial C}{\partial \varepsilon_D} < 0. \qquad \text{Q.E.D.}$$

So consumers also should prefer that tariffs be put on more inelastically demanded goods, since the same amount of revenue can be collected with a smaller tariff.

These conclusions are the same as those of Becker's as stated in Proposition 2 and its Corollary. Since revenue collected by the government under a tariff is assumed to be redistributed to producers through assistance, loans, tax breaks, or some other form of help, producers and policy makers should prefer policies which carry a smaller deadweight loss and yield a larger revenue to be redistributed for a given tax. Furthermore, even in the 19th century, when tariffs were used as a major source of federal revenue, the same argument should apply. Before income taxes were imposed in the U.S. in the early 1900s, one of the only sources of government revenue was from tariffs on foreign imports; so if the goal of the government was to raise revenue, tariffs would have been placed on goods where the deadweight loss was small and the revenue large. Becker's proposition implies that a bias exists in favor of these more efficient policies. Thus, according to his model, we should observe a much higher incidence of protection being granted to industries that manufacture goods for which demand is more inelastic.

H2: An increase in the size of an industry has a positive affect on the equilibrium subsidy.

$$\frac{\partial R_s}{\partial n_s} > 0.$$

Proof:

Show: $\frac{\partial R_s}{\partial n_s} = \frac{\partial R_s}{\partial p_s} \frac{\partial p_s}{\partial n_s} > 0.$

First, recall that $\frac{\partial R_s}{\partial p_s} = \frac{1}{p_m^s n_s} > 0$; further, from Proposition 3, $\frac{\partial p_s}{\partial n_s} > 0$. Thus, if the size of the subsidized group increases, its pressure will go up, increasing its subsidy. Therefore,

$$\frac{\partial R_s}{\partial n_s} > 0. \qquad \text{Q.E.D.}$$

The theory of regulation presented here emphasizes the size of pressure groups as an important factor for both industries seeking protection and regulators granting protection. Benefits that are concentrated in a relatively small subsidized group with costs dispersed among many taxpayers will be least opposed, since it does not pay for the taxpayers to protest a small cost. However, the industry or firm must be large enough to exert political pressure on the regulators, but not too large so as the benefits gained will be too diluted to be worth their while to exert pressure. Becker claims that there is an optimum size for pressure groups, but he is ambiguous as to what that optimum size should be. Seemingly, a larger group will be better at pressuring the government to grant them their policy provided that the taxpaying group is relatively much larger. Thus a larger industry should be more effective at securing protection for its good. Or more precisely, the propensity to get protection increases with size, but at a decreasing rate.

Hypotheses H3 through H5 will each be stated and explained with a general proof given at the end, since all three are derived similarly.

H3: Unionization of an industry increases the equilibrium subsidy. That is,

$$\frac{\partial(n_s R_s)}{\partial p_u^s} > 0, \quad where \quad p_u^s \equiv \frac{\partial p_s}{\partial u_s}$$

Since unions are generally organized and better able to pressure politicians for desired policies, the marginal product of unionization, $p_u^s > 0$. Hypothesis 3 states that if an industry becomes more efficient at producing political pressure because of unionization in the industry, then it will be able to raise its subsidy.

When a petition for protection is filed to the International Trade Commission, industries, firms, and workers (unions or associations) may be among the petitioners. According to the theory of regulation presented here, unionization should be a positive influencing force on the ability of an industry or firm to get protection. As discussed earlier, organized unions have been successful in pressuring the government for desired policies that benefit workers (see Freeman and Medoff 1984). Thus, it can be tested whether or not the involvement of unions or worker associations has had an influence on the ability of industries to get protection.

H4: Industries with a higher degree of concentration are more likely to increase their subsidies. That is,

$$\frac{\partial(n_s R_s)}{\partial p_c^s} > 0, \quad where \quad p_c^s \equiv \frac{\partial p_s}{\partial c_s}.$$

The more concentrated the production of output in an industry is, the more efficient it will be at

producing political pressure because of lower costs of organization; so we can assume that the marginal product of concentration, $p_c^s > 0$. Hypothesis 4 states that if an industry becomes more efficient at producing political pressure because of higher concentration, then it will be able to increase its subsidy.

The concentration of an industry should affect political outcomes because an industry with a small number of individual firms should have lower costs of organization, and thus should presumably be more efficient at producing political pressure and obtaining benefits. In general, according to the Becker model, the concentration ratio of an industry (among other factors) should affect organizational costs; thus an industry with a high concentration should be better at pressuring the political system to grant them protection and subsidies.

H5: Groups of firms are more likely than individual firms to increase their equilibrium subsidy. That is,

$$\frac{\partial(n_s R_s)}{\partial p_f^s} > 0, \quad where \ p_f^s \equiv \frac{\partial p_s}{\partial f_s}.$$

When a single firm petitions for protection, one would expect that firm to control a very large share of the market for its particular good, (i.e. one would expect a high concentration ratio in that industry). Otherwise, the costs incurred by a single firm pressuring for the policy may outweigh the benefits which will be dispersed among all producers (free rider problem). A group of firms which together dominate a market should be better at pressuring policy makers. Thus, the number of firms petitioning for the regulation should help predict the success of a request for protection.

Since a small organized group of firms should be more effective at producing political pressure than a single firm, we can assume that the marginal product of involving additional

firms in a petition for subsidies and protection is positive. That is, $p_f^s > 0$. Hypothesis 5 states that if an industry becomes more efficient at producing political pressure because more firms are involved in the petitioning process, then it will be able to increase its equilibrium subsidy.

Proof:

In general, for H3-H5, we need to show that:

$$\frac{\partial(n_s R_s)}{\partial p_i^s} = \frac{\partial(n_s R_s)}{\partial p_s}\frac{\partial p_s}{\partial p_i^s} > 0, \text{ where } p_i^s \equiv \frac{\partial p_s}{\partial i_s} \text{ and } i \in \{u_s, c_s, f_s\}.$$

First, recall that $\frac{\partial R_s}{\partial p_s} = \frac{1}{p_m^s n_s} > 0$. From Proposition 1, if a group becomes more efficient at producing political pressure, it will be able to raise its subsidy. In other words, $\frac{\partial R_s}{\partial p_m^s} > 0$, where $p_m^s \equiv \frac{\partial p_s}{\partial m_s} > 0$ denotes the marginal product of expenditures. Alternatively, consider other factors that affect the efficiency of an industry at producing political pressure. In particular, consider the marginal product of i, p_i^s for any $i \in \{u_s, c_s, f_s\}$. By Proposition 1, $sgn\ \frac{\partial p_s}{\partial p_i^s} = sgn\ \frac{\partial \Psi_s}{\partial p_i^s}$, where

$$\frac{\partial \Psi_s}{\partial p_i^s} = \frac{\frac{\partial I^s}{\partial p_s}\frac{\partial p_m^s}{\partial p_i^s}}{\frac{\partial G}{\partial R_s}} > 0, \quad \text{if } \frac{\partial p_m^s}{\partial p_i^s} > 0.$$

The assumption that $\frac{\partial p_m^s}{\partial p_i^s} > 0$, is reasonable because for any $i \in \{u_s, c_s, f_s\}$, an increase in p_i^s will have a positive affect on an industry's marginal product of expenditures. That is, an industry will be able to produce more pressure for the same expenditures if there is an increase in either unionization, concentration, or the number of firms petitioning. Therefore,

$$\frac{\partial(n_s R_s)}{\partial p_i^s} = \frac{\partial(n_s R_s)}{\partial p_s} \frac{\partial p_s}{\partial p_i^s} > 0. \qquad \text{Q.E.D.}$$

In summary, hypotheses H1 through H5, which are derived from Becker's model, are readily testable in the context of industries seeking trade regulation. Industries compete for the political favors of the regulators, while the regulators maximize their own political support by supplying subsidies to key industries which demand policy actions and provide that support. According to the pressure group model presented above, those industries that are granted subsidies will generally be more organized, larger, and better at producing political pressure; and, the policies they seek will be more efficient in terms of deadweight loss, so that opposition will be minimized. These hypotheses about which industries are most likely to be granted regulation will be tested using data on regulatory decision by the International Trade Commission.

CHAPTER : DATA AND ECONOMETRICS

To test the hypotheses of pressure group competition developed in Chapter 3, the estimations are conducted at three different levels. First, I look at the supply of regulation in an attempt to understand the behavior of the ITC. I seek to predict on what basis the ITC grants protection to industries; that is, what factors best explain the regulators' choices of which industries to protect. At this level, only those industries that actually apply to the ITC for regulation are used in the estimations; the regulatory decision is conditional on industries petitioning for relief. Next, I look at the set of *all* manufacturing industries in order to understand the demand for regulation. Why do some industries apply for protection while others do not? In other words, what factors best explain industry incentives to seek protection from the ITC? Finally, I use a nested logit model, (see McFadden, 1978) to incorporate both the supply and the demand sides of the regulatory issue. By applying a nested logit model, I wish to determine whether an industry's decision to apply for protection is affected by its perception of the likelihood of receiving a favorable ITC ruling. That is, are the three possible final outcomes (apply and get protection, apply and do not get protection, and do not apply), equally likely, or is an industry's decision to apply conditional on its probability of being successful? These questions will be explored in the following analysis.

A number of other regulatory studies that have focused on the ITC (see for example Shughart and Tollison, 1985 or Goldstein, 1986), have dealt only with either the demand or the supply side of the regulatory issue. In predicting regulatory behavior, however, both the decision of an industry to apply (or not) for relief and also the decision to grant that relief may be crucial factors in determining the probability of a final positive ITC decision. It is possible that

industries compare the utility from the alternative of not applying with the maximum expected utility that is possible from their applying, and choose the best available alternative accordingly. Ignoring the industry decision of whether or not to apply may result in a self-selection bias in the estimations of the supply for regulation. Thus, a nested logit model is used to test for the problem of selectivity.

Economic Theory

From existing trade and regulatory literature, several factors for each of the supply and demand sides of regulation can be identified, which, respectively, may influence the actions of the regulators and industries.

Supply:

On the supply side, general theories of regulation (e.g. Stigler, Peltzman, and Becker) predict that regulators seek to maximize their political support. To accomplish this goal, the regulator needs to satisfy key interest groups that will provide that support. In other words, the regulator will seek to satisfy politically strong groups in society at the expense of politically weak groups. The political strength of interest groups, particularly of industries seeking trade regulation, depends on several key factors which are readily identifiable in the regulation literature, and are directly linked to the hypotheses of Becker's model discussed in Chapter 3.

According to regulatory theories, in particular the Becker model, one factor that should affect the supply of regulation is the efficiency of policy alternatives. That is, both the nature of the regulation and which industries are granted regulation are decided by politicians on the basis of what offers the least costs and greatest benefits to society. Regulation will be granted to industries where the deadweight costs of the policy are lowest and the subsidies are largest. Thus the group that finally receives support is the most efficient in terms of costs and benefits,

as stated in Hypothesis 1 of Chapter 3. A good measure of the deadweight costs of a tariff on a certain good is the elasticity of demand for that good. More inelastically demanded goods have a lower deadweight loss for a given tariff rate. Tariffs on these goods are more efficient; thus industries that produce more inelastically demanded goods should be more likely to receive regulation.

The political significance of the distribution of costs and benefits is emphasized in both the regulation theories developed by Stigler, Peltzman and Becker, and the theory of collective action developed by Olson. Benefits which are distributed to a single industry with costs dispersed over a large number of taxpayers are not likely to be opposed. This is because taxpayers have little incentive to organize and oppose small dispersed costs. So regulators are more likely to supply benefits when no particular public sector bears all of the costs. That is, industries are more likely to be granted regulation as long as there is a large taxpaying group.

A second factor, then, that may affect an industry's ability to influence regulators is its size. According to Olson, it has been observed that groups that are small relative to the size of any opposing group are more effective at organizing and taking action.[26] Since industries are small relative to the taxpaying groups in society, they should be more effective at pressuring for higher tariffs than taxpayers should be at opposing such policies. However, successful pressuring of politicians also necessarily requires an ability to command power and influence; thus larger industries, which are generally more powerful and persuasive, should be more effective than smaller ones at influencing the political system and obtaining desired policies. Also, according to Becker, small groups may not be able to take advantage of economies of

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26. Olson, pp. 52.

scale in the production of pressure.[27] Yet there are diminishing returns to the size of pressure groups; if a group becomes too large, the benefits of regulation will be too dispersed to be worth their while. So political strength should increase with the size of an industry seeking protection, but at a decreasing rate, as stated in Hypothesis 2. To test the hypothesis that size affects policy outcomes, good proxies for the size of an industry are its total value of shipments or total employment. The higher an industry's value of shipments or employment, the greater should be its ability to pressure for and obtain regulation.

Related to this notion is the political significance of group organization. The degree of organization of an interest group will affect the supply as well as the demand for regulation. This is because the costs of making decisions and coordinating actions are much smaller when a group is more organized; thus the group will be more efficient at producing pressure and affecting policy outcomes. So industries that are in some way more organized will have more political strength, and thus will be more likely to affect the decisions of politicians who supply the regulation. This notion comprises Hypotheses 3, 4, and 5. Several variables will be used as proxies for measures of the degree of organization of an industry. Concentration and unionization are two good measures for the degree of organization. In general, industries with higher degrees of concentration and unionization should be more organized and better at pressuring policy makers. Higher concentration in an industry implies fewer free rider problems and more opportunities for reaching a consensus, thus a greater degree of organization. Unionization implies organization and an opportunity for collective action, thus union support should positively affect an applicants ability to pressure policy makers. A third measure of the degree of organization of an interest group is based on whether there is a single-firm or multi-firm

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27. Becker, pp. 395.

petition. If the industry pressure group is made up of a number of firms applying together as a group for protection, they have presumably overcome some of the costs and barriers to organization, and thus should be more successful, than a single firm, at applying political pressure. So the higher its degree of organization, measured in terms of concentration, unionization, and type of petitioner, the more successful an industry will be at affecting policy outcomes.

A final possible affect on a politicians' decision to supply trade regulation may be due to political pressure at a macro or national level. (Takacs, for example, focuses on cyclical national economic trends in explaining ITC behavior.) A general slump in the economy, which results in such problems as high unemployment, inflation, large deficits, or the like, may put pressure on the regulators to take some action to improve the economic conditions of the public, especially the more outspoken groups of society. So national economic trends like the U.S. trade deficit and the unemployment rate can be used as proxies for national trends that may affect the supply of regulation.

Demand:

Certain factors exist which may help to determine whether or not an industry will demand regulation. For example, loss of market share may drive an industry to seek some form of regulation which will raise profits. A good measure of this trend is the percent change in domestic market share controlled by each of the industries. In general, industries with a relatively large loss in market share should be more likely to demand regulation. Also, an industry that is forced to cut costs and lay off employees should by more likely to apply for protection. Pressure from workers or unions may drive an industry to seek regulation when employment is dropping in the industry. This trend is measured by the percentage change in employment in each industry.

Another factor affecting an industry's demand for regulation may be the industry's prior level of regulation. A highly protected industry is less likely to pressure for additional regulation than a relatively unprotected industry, since the costs of acquiring additional regulation would likely exceed the benefits. In other words, there are increasing costs and diminishing returns to acquiring additional regulation. An industry's existing tariff rate should be a good measure of its likelihood of seeking protection.

Finally, the degree of organization in an industry may affect its decision to pressure for regulation. A more organized interest group will be better at pressuring for regulatory benefits and securing desired policy outcomes. Also, an industry which is highly organized and controls free riding will face fewer costs and reap larger benefits from pursuing regulation. The degree of organization can be measured by the concentration ratio on an industry. Higher concentration implies fewer free riders and lower costs of organization, thus a greater likelihood that an industry will demand regulation.

Data

The data on regulatory decisions by the ITC in this study cover a period of a little more that ten years, from the passage of the 1974 Trade Act to the beginning of 1985. These years were chosen because the rules under which the ITC operated prior to 1974 were significantly different, enough so as to preclude pooling data from before 1974 with data from after 1974. The data include all ITC cases considered under the Escape Clause, the Antidumping Act, and the Countervailing Duty Investigations discussed earlier.

On the supply side, there were 616 investigations conducted by the International Trade Commission between 1975 and 1984. Of these 616 cases, there are 314 antidumping cases, 231 countervailing duty cases, and 71 escape clause cases. These were categorized by the four

digit Standard Industrial Classification (SIC) code corresponding to each petition. At the four digit SIC level, there are 290 industry petitions. (This number is smaller than the total number of cases because some four digit industries filed more than one petition. The outcome of the industry petitions is the dependent variable; a value of 1 is assigned to industries if any case received some form of relief through ITC action in a given year, and a 0 to those that were denied relief or protection. About 43% of the industries that filed petitions in these years were granted some form of regulatory relief.

On the demand side, there are 425 four digit SIC manufacturing industries included in this study (out of a total of approximately 450) with data for the same period, 1975 to 1984. A value of 1 is assigned in cases where at least one petition is filed for any industry in a given year, and a 0 to cases where no petitions are filed. Industries filed a petition with the ITC in only about 7% of the 4250 entries across the ten years.

Most of the data used in this study is coded at the four digit SIC level. When data are not available at the four digit level, three digit level data are used instead, with entries repeated for each corresponding four digit code. The independent variables which are used to explain the supply and demand for the regulation of international trade are as follows:

(1) The elasticities of demand are available for 122 three digit SIC industries (Shiells, Stern, & Deardorff, 1985). The elasticities were computed from estimates of cross price elasticities of U.S. import demand and measures of import share for these industries using Cournot Aggregation. See Appendix B for the method of computing the elasticities. The elasticities range from -3.86 to 1.94 with a mean of -1.06. Among those industries whose goods are more elastic are the furniture, drapery, and motorcycle industries, while clocks and watches, plastics, and footwear are among the goods with more inelastic demands. Five of the industries in the study

have positive elasticity values implying that higher prices leads to greater demand for the goods in these industries. These are the nonrubber footwear, leather gloves, fur goods, lumber, and radio and television equipment industries. The cross price elasticities for nonrubber footwear, leather gloves, and fur goods are extreme outliers; so their price elasticity values will be left out of the data analysis. It may be the case that the nature of the select market for such goods as fur coats and leather gloves makes demand for these goods increase regardless of a rise in their prices; in other words, higher prices in these markets may not discourage consumption perhaps because higher prices, in and of themselves, make these luxury items more attractive to their consumers. (See Appendix D for descriptive statistic on the variables used in this study.)

(2) The size of the industry petitioning for protection is measured by the value of total shipments or total employment, both at the four digit SIC industry level. From the theories of regulation presented here, size should be a significant factor in affecting policy outcomes. In particular, Becker's theory seems to predict that larger groups will be more successful at influencing the government (given a sufficiently large taxpaying group). Because of a high degree of correlation between the employment and shipment variables, only one will be used in the analysis. Employment was chosen over value of shipments because there were fewer missing data entries for this variable. Also, the employment variable should perform better as a proxy for size in measuring an industry's influence over policy outcomes because workers face lay-offs if domestic production drops due to increases in foreign imports and politicians tend to pay attention to the demands of unions or large organized groups of workers that pressure for legislative action. Employment at the four digit SIC level in the industries ranges from 600 in the reclaimed rubber industry to over 500,000 employees in the miscellaneous plastics and radio and television equipment industries, with a mean of 42,000 overall.

(3) The petitioners in the investigations are classified into three categories: single firms (209 cases), multiple firms (317 cases), and the administration (28 cases), which includes petitions filed by members of Congress, a committee of Congress, the President, the Special Trade Representative, or the ITC itself. A variety of industries belong to each type of petitioner category.

(4) Unions or worker associations are sometimes included among the petitioners. A value of 1 was assigned to cases that included one of these groups as petitioners, and a value of 0 to those that did not. These occurred in mostly the blast furnace and steel industries, but also included a variety of others.

(5) Several variables may be used to capture overall yearly trade related economic trends in the U.S. The two that will be used in this study are the yearly percentage change in gross national product and the U.S. trade deficit. A higher trade deficit should have a positive effect on an industry's request for protection, while the change in GNP should be negatively correlated with protectionist tendencies. This is because policy makers should be more willing to help industries when the overall economy is performing poorly than when it is prospering. The trade deficit variable ranges from a trade surplus of over $9 billion in 1975 to a deficit of over $60 billion in 1983 and $110 billion in 1984.

(6) Capacity utilization is used as a measure to capture production efficiency in an industry and is also coded at the four digit SIC industry level. The percentage of capacity utilization varies from 100 percent for certain years in such industries as butter, sugar, cooking oil, periodicals, ceramic tiles, and certain clothing and footwear industries, to 13 percent in the space vehicle and guided missile industries, with a mean of 69 percent.

(7) An industry's share of the domestic market is an important factor which should affect its demand for regulation. If an industry's percentage share of the domestic market drops from

one year to the next because of an increase in imports, then it should be more likely to seek protection from foreign competition. The change in market share is measured at the four digit SIC level and is the change in the percentage of the domestic market controlled by the industry. (The data on value of imports, exports, and shipments were made available by Clinton Shiells and Greg Schoepfle, both with the U.S. Department of Labor. See also the Bureau of the Census publications on imports, exports, and shipments by SIC code for these years.) This variable varies from -4.39 to 8.36 with a mean of -0.01 percent. The industry with the largest percentage increase in market share was the primary metals industry, while the largest decreases occurred in the fabricated rubber industry and in the primary metals industry in a different year.

(8) The existing tariff rates of industries recorded at the three digit SIC level should also be an indicator of industry demand for protection. The higher the existing tariff rate, the less likely an industry will be to demand greater protection. These rates are available from the *Tariff Schedules of the United States* for the relevant years. The tariff rates on U.S. industries range from 0 to 114 percent ad valorem with a mean of 36 percent. Since no major international trade negotiations were conducted by U.S. Presidents in the years covered by this study, the rates, as a whole, did not change significantly over this period of time. Some changes, however, did occur as a result of congressional legislation, limited presidential concessions, or ITC investigations.

(9) Finally, the concentration ratio of the industry should affect both the supply and demand for regulation. Concentration is a measure of the percentage of output by the four largest firms in an industry. The concentration ratio of an industry, recorded at the four digit SIC level, is used as a proxy for an industry's costs of organization. On the supply side, higher concentration should indicate lower costs of organization, thus a greater ability to produce pressure and

affect policy outcomes. On the demand side, a higher concentration ratio means fewer free riders and larger gains from demanding regulation. The primary lead industry had the highest concentration (100 percent), while specialized industry machinery, and certain wood, printing, and concrete industries had concentrations at or below 5 percent, with the overall industry mean at 39 percent.

Econometrics

In this section, I describe the three levels of estimation that are used to explain the supply of and demand for trade regulation. To estimate the supply and demand for regulation separately, a simple logit model is used for each. Given a binary dependent variable, I assume a logistic cumulative distribution for the error term, and use a logit model to estimate the coefficients of the independent variables.

For the supply side, we assume that $s_i^* = \beta' X_i + u_i$, where s_i^* is a latent continuous measure of the likelihood that the ITC will grant protection to some industry i and u_i is the error term. Assume

$s = 1$ if $s_i^* > 0$ and

$s = 0$ otherwise,

then prob($s_i^* > 0 \mid X_i$) = prob($u_i > -\beta' X_i$) = 1 - F($-\beta' X_i$) where F($\beta' X_i$) is a logistic distribution. The log likelihood function for the logit model is

$$\log L(\beta_1 \cdots \beta_k) = \sum_{i=1}^{T} \left[s_i \log F(\beta' X_i) + (1 - s_i) \log(1 - F(\beta' X_i)) \right].$$

Maximizing this with respect to β_i gives the coefficients for the best fit of the s_i to the independent variables. In my model, $s_i^* = \beta_1 E + \beta_2 P + \beta_3 U + \beta_4 Z + u_i$ where

> **E** is the matrix of economic variables specific to each individual industry. (These include elasticity of demand, capacity utilization, concentration ratios, employment in the industry, market share, and prior tariff rates.)
>
> **P** is a matrix of variables denoting the nature of the petitioner in each case.
>
> **U** is a vector denoting union involvement in the petition.
>
> **Z** is a matrix of national economic variables that are assumed to have an effect on the granting of protection. (This includes the yearly trade deficit or change in GNP.)

According to the theory of the supply of regulation presented in this paper, one would expect each of these variables to affect an industry's probability of getting protection for their goods.

For the demand side, $d_i^* = \gamma' y_i + \eta_i$, where d_i^* is some unobservable probability that an industry will apply for protection from the ITC and η_i is the error term. Maximizing the log likelihood function with respect to γ_i gives the coefficient for the best fit of the d_i to the independent variables. In the demand model, $d_i^* = \gamma' y_i + \eta_i$ where

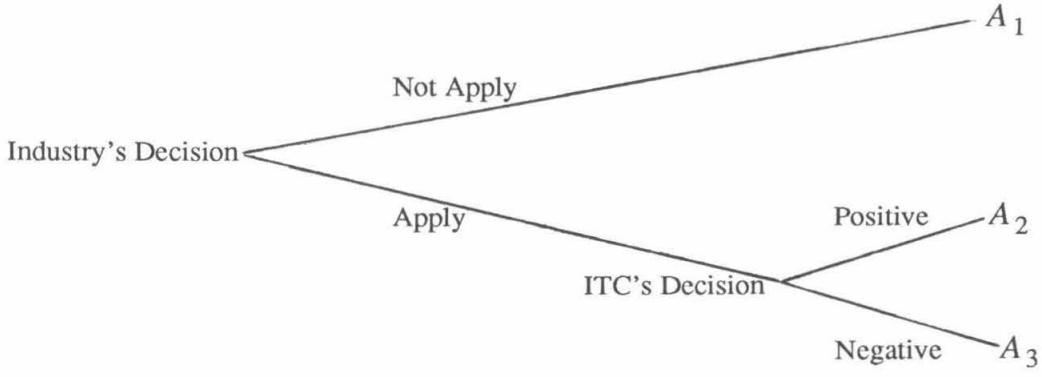
> **y** is the matrix of economic variables, specific to each individual industry, that may drive an industry to seek regulation from the ITC. (These include such variables as industry concentration ratios, percentage change in employment in the industry, change in market share, and prior tariff rates.)

According to theories of the demand for regulation, one would expect that each of these variables may affect an industry's probability of applying for protection for its goods.

Finally, a nested logit model will be applied to the study of the demand for and supply of trade regulation to determine whether industries base their decisions to apply on their perception of the expected utlity of getting protection. The demanders (industries) face the binary choice of whether or not to undergo the costs of applying and pressuring for trade regulation. The supplier, the International Trade Commission, makes the binary decision of whether or not to grant regulatory benefits to each of the applicants. Here, I want to determine whether self-selection is a problem in predicting the probability of an industry getting protection; that is, do

industries self-select themselves in choosing whether or not to apply? By comparing the utility of not applying with the maximum expected utility that can be derived from filing an application, an industry can make a rational decision as to the usefulness of his seeking protection from the ITC. By using a nested logit model, we can determine whether or not self-selection is occurring.

Diagram 5 (below) illustrates the postulated structure of the model for the actors' choices. The model assumes that the regulator's decision is conditional on an industry's choice of applying. Stage 1 is the industry's decision of whether or not to file an application for protection. Stage 2 is the ITC's decision of whether or not to grant protection to the industry. The nested logit model was chosen because it characterizes the two stage decision process well and because it allows for dependence among the attributes of the alternatives.



TWO-STAGE DECISION PROCESS

Diagram 5

Suppose the utility of final outcome ri is represented by U_{ri}. The utility can be rewritten as the sum of the observable components V_{ri} and the unobservable disturbances ε_{ri}:

$$U_{ri} = V_{ri} + \varepsilon_{ri} \quad for\ i, r = 1, 2$$

where $i \equiv$ *industry choice*

$r \equiv$ *regulator choice.*

The strict utility of alternative ri, which is defined as the component of utility that is measurable or observable, is denoted by V_{ri} and can be expressed in the form $V_{ri} = W(r \mid i) + W(i)$, where $W(r \mid i)$ is the strict utility from components that depend on both the regulator and the industry decisions, while $W(i)$ is the strict utility from components that depend only on the industry choice. The probability that outcome ri is chosen, then, is given by:

$$P_{ri} = Prob\left[U_{ri} > U_{jk} \ \ \forall\ jk \neq ri \right]. \tag{1}$$

The ε_{ri} are the unobserved characteristics and are assumed to have a generalized extreme value (GEV) distribution. I assume a GEV distribution, instead of assuming that the ε_{ri}'s are independently and identically distributed with an extreme value distribution, because it is likely that including the alternative of industries not applying with the positive and negative ITC decision alternatives would violate the independence of the irrelevant alternatives assumption of the logit model. The GEV distribution, as it will be seen below, leads to a nested logit structure in which the regulatory commission's decision on granting protection is examined, given that the industry files a petition for regulatory action.

Recall that the generalized extreme value distribution is defined as:

$$F(\varepsilon_1, \varepsilon_2, \ldots, \varepsilon_n) = exp\,[-G(e^{-\varepsilon_1}, e^{-\varepsilon_2}, \ldots, e^{-\varepsilon_n})],$$

where the generating function $G = G(Y_1, \ldots, Y_J)$ is non-negative and homogeneous of degree one with $(Y_1, \ldots, Y_J) \geq 0$. Also, $\lim_{Y_c \to +\infty} G(Y_1, \ldots, Y_J) = +\infty$ for

$c = 1, \ldots, J$, and for any distinct $(c_1, \ldots, c_k)$ from $\{1, \ldots, J\}$, $\partial^k G / \partial Y_{c_1} \cdots \partial Y_{c_k}$ is non-negative if k is odd and non-positive if k is even. It is known (see McFadden, 1978) that the probabilities derived from the GEV distribution define a choice model that is consistent with random utility maximization. These probabilities are given by:

$$P_c = \frac{Y_c \dfrac{\partial G}{\partial Y_c}(Y_1, \ldots, Y_J)}{G(Y_1, \ldots, Y_J)} \quad \textit{for } c = 1, \ldots, J. \tag{2}$$

For the case of three alternatives considered in Diagram 5 above, we can define the function G as follows:

$$G(Y_1, Y_2, Y_3) = Y_1 + \left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}. \tag{3}$$

Then from equation (2), the following conditional probabilities can then be computed.

$$P(A_2 | A_1, A_2, A_3) = \frac{Y_2 \dfrac{\partial G(Y_1, Y_2, Y_3)}{\partial Y_2}}{G(Y_1, Y_2, Y_3)}$$

$$= \frac{Y_2^{\frac{1}{1-\sigma}} \left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{-\sigma}}{Y_1 + \left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}}. \tag{4}$$

Conditional on choosing one of the alternatives A_2 and A_3 (e.g. applying for protection and

getting a positive ruling or applying and getting a negative ruling), the probabilities have the binomial logit forms:

$$P(A_2 | A_2, A_3) = \frac{Y_2^{\frac{1}{1-\sigma}}}{Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}}} \tag{5}$$

and

$$P(A_3 | A_2, A_3) = \frac{Y_3^{\frac{1}{1-\sigma}}}{Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}}} . \tag{6}$$

Furthermore, for the probability of an industry applying we have:

$$P(A_2, A_3 | A_1, A_2, A_3) = \frac{\left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}}{Y_1 + \left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}} . \tag{7}$$

Assuming that $U_{ri} = V_{ri} + \varepsilon_{ri}$ where $V_{ri} = \log Y_{ri}$ denotes the strict utility of alternative ri, we can now identify the components of the strict utility, V_{ri}. Recall, V_{ri} is the utility of the final outcome A_1, A_2, or A_3. $W(i)$ is the component of the utility that depends only on the industry choice, namely $W(Apply)$ or $W(Not\ Apply)$, while $W(r \mid i)$ is just $W(Positive \mid Apply)$ or $W(Negative \mid Apply)$. As $V_{ri} = W(r \mid i) + W(i)$, we assume the following:

$$W(Not\ Apply) = -\alpha' y$$
$$W(Apply) = 0$$
$$W(Positive \mid Apply) = (1-\sigma)\beta' X$$
$$W(Negative \mid Apply) = 0.^{28}$$

Then by substitution,

$$V_{A_1} = W(Not\ Apply) = \log Y_1 = -\alpha' y \tag{8}$$

$$V_{A_2} = W(Positive \mid Apply) + W(Apply) = \log Y_2 = (1-\sigma)\beta' X \tag{9}$$

$$V_{A_3} = W(Negative \mid Apply) + W(Apply) = \log Y_3 = 0, \tag{10}$$

where, from Diagram 5,

$A_1 \equiv$ *Industry i does not apply*
$A_2 \equiv$ *Positive ITC decision given industry i applies*
$A_3 \equiv$ *Negative ITC decision given industry i applies.*

The vector X comprises the observed characteristics that are believed to explain the regulator's choice of whether or not to grant industry i protection (the supply of regulation), and y is the vector of observed characteristics that vary with an industry's choice of whether or not to apply (the demand for regulation). Next, by substitution, it is possible to calculate the probabilities of the alternatives at the two different stages of the decision tree. See Appendix E for details of the computations of the probabilities.

Using equations (5) and (6), the probabilities for the ITC decisions on whether or not to grant protection given that an industry applies may be written as:

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28. Note that the utilities are normalized such that $W(Apply) = 0$ and $W(Negative \mid Apply) = 0$.

$$P(A_2 \mid A_2, A_3) = \frac{e^{\beta' X}}{1 + e^{\beta' X}} = \frac{1}{1 + e^{-\beta' X}} \tag{11}$$

$$P(A_3 \mid A_2, A_3) = \frac{e^{-\beta' X}}{1 + e^{-\beta' X}} \cdot \tag{12}$$

For the industry decision, using equation (7) the probabilities of applying and not applying have the following forms:

$$P(A_2, A_3 \mid A_1, A_2, A_3) = \frac{e^{(1-\sigma)INCV}}{e^{-\alpha' y} + e^{(1-\sigma)INCV}}$$

$$= \frac{1}{1 + e^{-[\alpha' y + (1-\sigma)INCV]}} \tag{13}$$

$$P(A_1 \mid A_1, A_2, A_3) = \frac{e^{-[\alpha' y + (1-\sigma)INCV]}}{1 + e^{-[\alpha' y + (1-\sigma)INCV]}} \tag{14}$$

where the inclusive value, $\text{INCV} \equiv \log\left[1 + e^{\beta' X}\right]$.

Finally, from (11) and (13), the probability of an industry getting protection, given that it applies, may be written as:

$$P_{A_2} = P_{A_2 \mid \{A_2, A_3\}} \cdot P_{\{A_2, A_3\} \mid \{A_1, A_2, A_3\}}$$

$$= \frac{1}{1 + e^{-\beta' X}} \cdot \frac{1}{1 + e^{-[\alpha' y + (1-\sigma)INCV]}} \cdot \tag{15}$$

A sufficient condition for a nested logit model to be consistent with stochastic utility maximization is that the coefficient of the inclusive value, $(1 - \sigma)$ lie between 0 and 1. (See

for example, McFadden 1978.) When the coefficient of the inclusive value is 1, we get the multinomial logit form for P_{A_2} where the three alternatives are independent. When the coefficient is 0, then the probability of an industry getting protection is the product of two logit elements. That is,

$$P_{A_2} = \begin{cases} \dfrac{e^{\beta' X}}{1 + e^{\beta' X} + e^{-\alpha' y}} & \text{if } (1 - \sigma) = 1 \\ \dfrac{1}{1 + e^{-\beta' X}} \cdot \dfrac{1}{1 + e^{-\alpha' y}} & \text{if } (1 - \sigma) = 0. \end{cases}$$

The estimation of the probability of outcome A_2, may be done in two stages. First, we estimate the parameters, β, from the conditional probability, $P(A_2 | A_2, A_3)$. After defining an inclusive value, INCV, as the log of the denominator of the estimated conditional choice model, we then estimate the parameters of α from the probability model $P(A_2, A_3)$, given INCV.

In order to include the inclusive value as an independent variable in the estimation of P_{A_2}, a value for INCV is needed for all industries--both those that apply and those that do not apply. Using the estimates of the β's from those industries that do apply, an inclusive value is computed for *each* industry. The INCV variable denotes the expected maximum utility that may be obtained by applying for protection, given one's own characteristics. Thus, in estimating the industry choice of whether or not to apply, if the coefficient of the inclusive value is zero (i.e. $\sigma = 1$), then industries choose between the alternatives by comparing the utility of

not applying with the maximum expected utility that they can derive from applying.[29]

For the nested logit model, the matrix of variables that may affect the supply of regulation is defined by

> X = (elasticity, concentration, capacity utilization, employment, percentage change in employment, percentage change in market share, U.S. trade deficit, tariff rate).[30]

The matrix of variables that may affect the demand for regulation is defined by

> y = (concentration, percentage change in employment, percentage change in market share, tariff rate)

Both the industries and regulators are faced with binary decisions. The supply and demand variables above are used as the independent variables to explain regulator and industry behavior respectively. The nested logit model, then, is used to estimate the parameters β, α, and σ.

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29. In the limit, as σ goes to 1, $e^{V_{A_1}} + \left[e^{\frac{V_{A_2}}{1-\sigma}} + e^{\frac{V_{A_3}}{1-\sigma}} \right]^{1-\sigma} = e^{V_{A_1}} + \max\left[e^{V_{A_2}}, e^{V_{A_3}} \right]$. See Appendix F for the proof.

30. Note that the variables for unionization and petitioner type were necessarily excluded from the nested logit model because the data are peculiar only to industries that have actually applied for protection, which means that an inclusive value cannot be determined for non-applicants.

Estimations

Supply Model

Table 2 below contains the results of the straight supply side estimations where the binary logit model, discussed earlier, is applied to the data on ITC decisions. The choice variable in Table 2 is the ITC's decision (1 for positive, 0 for negative) on whether or not to grant protection to a *petitioning* industry.

Table 2

LOGIT ESTIMATIONS OF THE DETERMINANTS OF ITC DECISIONS

Dependent variable: ITC decision: 1 = protection, 0 = no protection

Value	Count	Percent
0	122	60.40
1	80	39.60

total number of observations 202

Independent Variable	Estimated Coefficient	t-Statistic
Constant	-1.09	-0.94
Elasticity of Demand	-0.46	-1.49
Industry Concentration Ratios	-3.12	-0.04
Administration petition	-0.67	-1.01
Single firm petition	-0.88	-2.56**
Unionization	-0.23	-0.36
Industry Employment	3.21	2.38**
Change Industry Employment	-0.69	-0.41
Change in Market Share	6.01	1.49
Capacity Utilization	-6.04	-0.44
Tariff Rate	9.96	0.89
U.S. Trade Deficit	9.64	1.89*

percent correctly predicted = 68

* signifies a 10 % significance level.
** signifies a 5% significance level or better.

The results indicate some degree of support for the pressure group model discussed in Chapter

3. The size of the industry measured by the employment variable indicates that larger industries are more likely to get protection than smaller ones. This lends support to the hypothesis that size matters and that larger industries are better able to secure desired regulatory action, perhaps because of their greater political power relative to smaller industries. Further, the single petitioner variable indicates that there may be power in numbers; a single firm may be less likely to succeed in pressuring for protection than a group of firms that petition together. These comprise hypotheses H2 and H5 respectfully. The employment and the single petitioner variables are both significant at the 2% level.

Hypothesis H1, that industries whose goods have a more inelastic demand are more likely to get protection because of less deadweight loss, is not supported. The elasticity variable, a proxy for efficient policies, is insignificant, but has the opposite sign from that predicted by Becker's pressure group model; the negative sign on the elasticity coefficient indicates that of those industries that applied for protection in this period, those producing more inelastically demanded goods were *less* likely to get protection than industries producing goods with a more elastic demand. Thus, the notion that regulators make decisions based on the efficiency of their policy choices is not supported by this supply-side analysis.

Concentration and unionization, which are proxies for industries' costs of organization, should be good measures of an industry's ability to pressure for political outcomes. Recall hypotheses H3 and H4 which implied that the greater an interest groups' organization and the lower the costs of that organization, the greater its political power or influence should be; but both of these variables are insignificant in predicting ITC decisions. Though pressure group theory suggests that the more concentrated an interest group is, the better it should be at pressuring policy makers, an alternative hypothesis to consider is that a high degree of concentration in production is not as important in terms of political influence on trade as some other

factors like geographic concentration. Concentration ratios measure the percentage of output by the four largest firms in an industry. Though higher concentration may indicate greater organization in an industry, it may be that more political power is generated when an industry controls a number of states and congressional districts than when it is concentrated in a small number of firms and a single location. For example, it may be that the lumber industry, which has a very low concentration ratio, but is geographically concentrated and especially strong across the Pacific Northwest, will have as much political power in getting trade protection as a highly concentrated one such as the motor vehicle industry. So low concentration combined with geographic political strength may be as important as production concentration in terms of political power for industries seeking protection from foreign imports.

Besides these five variables, which correspond to the five hypotheses presented in Chapter 3, other variables were also included in the analysis to capture indicators of economic hardship and need for regulation. The variable measuring percent change in employment in the industries has the predicted sign, but is insignificant. Decreasing employment should be an indicator of a need for protection in an industry; but the percentage change in employment by industry appears to have little or no effect on ITC decisions.

Another indicator of a need for protection is the percentage change in an industry's share of the domestic market. The larger an industry's increase in domestic market share, the less of a threat that is posed by foreign imports, thus the lower should be its need (or desire) for protection. However, the results in Table 2 indicate that the larger an industry's increase in market share, the more likely the ITC is to grant it protection. But the t-statistic is insignificant.

The yearly U.S. trade deficit was used to capture national economic trends that would affect an industry's likelihood of getting protection. This variable, significant at the 90% level,

indicates that industries are more likely to get protection the greater the trade deficit is in the U.S.

Finally, additional industry-specific indicators of economic need for protection were included in the analysis; these are capacity utilization and existing tariff rates. The capacity utilization of an industry, which is a measure of the percentage of plant capacity that is being used in production, was included as an indicator of how well an industry is performing. A low capacity indicates large amounts of idle resources, hence lower production in the industry. The results in Table 2 indicate that industries with a lower capacity are more likely to get protection, but the statistic is insignificant. Though capacity is low in some industries that suffer from foreign competition, it is also the case that industries such as space vehicles and equipment, tanks, small arms and ammunition, and gasoline pumps, which all face relatively little competition from foreign imports, are among the industries with the lowest capacity utilization figures. Thus, the fact that some industries with low capacity face relatively little foreign competition may be the reason for the insignificance of this variable. So capacity appears not be an accurate measure of an industry's need (or desire) for protection.

Whether or not industries already have high tariffs also does not appear to explain ITC decisions. Though the variable for tariff rates is positively correlated with an applicant's likelihood of being granted protection, it is insignificant. However, since a wide range of tariff rates exist in the U.S., there is no reason to believe that the ITC has some sense of an "ideal" rate; thus, existing rates presumably should have little or no effect on ITC decisions.

Neither capacity utilization, percentage change in employment, percentage change in market share, nor existing tariff rates appear to be good measures of ITC behavior. None of these measures of economic hardship are significant predictors of ITC decision-making. Measures of political power or influence, namely size and petitioner type, seem to be the only

industry specific characteristics in this model that affect whether or not an industry will get protection from the ITC.

Demand Model

On the demand side, Table 3 contains the results of applying a logit model to data comprising industries' decisions of whether or not to apply for protection. The binary choice variable is the industry's decision (1 for positive, 0 for negative). The results indicate that industries that already have higher tariffs, and ones that increase their market shares and employment, are all less likely to apply.

Table 3

LOGIT ESTIMATIONS OF THE DETERMINANTS OF INDUSTRY DECISIONS

Dependent variable: Industry decision: 1 = apply, 0 = do not apply

Value	Count	Percent
0	2853	92.42
1	234	7.58

total number of observations 3087

Independent Variable	Estimated Coefficient	t-Statistic
Constant	-1.49	-8.87**
Industry Concentration Ratios	-4.08	-1.35
Percentage Change in Industry Employment	-1.56	-2.53**
Percentage Change in Market Share	-0.18	-0.49
Existing Tariff Rate	-1.53	-3.36**

percent correctly predicted = 92.42

Concentration again has the opposite sign than initially expected, if one believes that concentration implies organization and political power. Industries with lower concentration

ratios are more likely to apply than those more highly concentrated. As discussed earlier, concentration may not be a good measure of political strength.

Both the employment and tariff variables are significant with the percentage change employment significant at the 2% level and the measure of tariffs significant at the 1% level. This seems to indicate that industries do apply for protection when they are at an economic disadvantage and are doing poorly.

In summary, the demand and supply estimations indicate that industries with lower existing tariffs and decreasing employment are more likely to apply for protection via the ITC, while larger industries that apply as a group are more likely to be granted a favorable ruling by the ITC. However, by estimating the supply and demand equations separately, the potential problem of self-selectivity is ignored. It may be the case that those industries that actually apply to the ITC are a select group of all industries and that they, in general, are likely to benefit more from applying than a randomly selected set of industries. Therefore, it is important to account for any selectivity bias in the estimations and analysis.

Nested Supply and Demand Model

For the final analysis, a nested logit model is used to estimate the supply of and demand for trade regulation; the estimated coefficients of the ITC choice model are used to calculate an inclusive value, vector INCV, for all industries. As mentioned earlier, in order to create an inclusive value for all industries, it was necessary to exclude the variables for unionization and petitioner type which are peculiar only to industries that file a petition. This vector is then included as an independent variable in the estimation of the likelihood of an industry applying to the ITC for protection.

Along with the inclusive value, all of the previous variables that are believed to affect

Table 4

NESTED LOGIT MODEL

Logit Estimations of the Determinants of ITC Decisions
Dependent variable: ITC decision: 1 = protection, 0 = no protection

Value	Count	Percent
0	125	60.98
1	80	39.02

total number of observations 205

Independent Variable	Estimated Coefficient	t-Statistic
Constant	-1.42	-1.29
Elasticity of Demand	-0.42	-1.44
Industry Concentration Ratios	-3.50	-0.50
Industry Employment	2.73	2.14**
Percentage Change in Industry Employment	-1.14	-0.71
Percentage Change in Market Share	6.08	1.57
Capacity Utilization	-7.41	-0.56
Tariff Rate	1.22	1.10
U.S. Trade Deficit	1.28	2.63**

percent correctly predicted = 67

Logit Estimation of the Determinants of Industry Decisions
Dependent variable: Industry decision: 1 = apply, 0 = do not apply

Value	Count	Percent
0	2698	92.94
1	205	7.06

total number of observations 2903

Independent Variable	Estimated Coefficient	t-Statistic
Constant	-2.10	-9.37**
Industry Concentration Ratios	-3.80	-1.07
Percentage Change in Industry Employment	-1.30	-1.88*
Percentage Change in Market Share	-0.47	-1.43
Tariff Rate	-1.17	-2.54**
Inclusive Value	0.11	1.55

percent correctly predicted = 92.94

an industry's decision to apply for trade relief are included in the logit estimations. The results of the nested logit model appear in Table 4. The table shows again that the supply of trade regulation by the ITC appears to be best predicted by industry size and national economic trends rather than economic need or efficient policy choice. In the second stage, a drop in employment and lower relative tariff rates seem to be the best explanatory variables for when an industry will apply for regulation. Finally, the low coefficient on the inclusive value variable indicates that industries do self-select themselves in deciding to file applications for protection. That is, it is likely that industries base their decisions to apply on their perception of the maximum expected utility of being granted protection by the ITC.

The null hypothesis that the coefficient of the inclusive value, $1-\sigma$, equals 1 is rejected at the 5% significance level, while the alternative hypothesis that $1-\sigma$ equals 0 is accepted. Thus it is likely that some unobserved effect that makes industries successful in petitioning for protection, is correlated with the unobserved components that lead an industry to apply for regulation in the first place. It is this possibility of correlation between the unobserved characteristics that leads to a violation of the assumption of the independence of irrelevant alternatives (IIA), which makes the three alternative multinomial logit model inappropriate. For this reason, we shall consider the nested logit model a more valid representation of the observed phenomena.

Chamberlain (1980) discusses the possibility of an omitted variable bias due to a failure of controlling for group specific effects. That is, variables that are constant within a group are omitted from the regression. If variables that capture group differences are omitted and if these variables are correlated with other independent variables in the regression, then the regression function will, in general, not identify the coefficients. In both the industry decision stage and the ITC decision stage of the nested logit model used here, there is the potential

problem of an omitted variable bias which could be corrected by applying the Chamberlain methods.

Hausman and McFadden (1984) provide a means of testing if the nested logit model is the correct specification or whether the outcomes obey the property of independence of irrelevent alternatives (IIA). The purpose of the specification test is to determine if the probability of an industry getting protection from the ITC is the same whether or not the factors that led the industry to apply in the first place are considered in the model. In other words we want to test whether the coefficients on the explanatory variables affecting the outcome that industries apply and get protection (outcome A_2) are the same for the unconditional and the conditional choice models.

Recall that V_{ri} is defined as the utility of outcomes A_1, A_2, or A_3 where $V_{ri} = W(r \mid i) + W(i)$ and $W(i)$ depends only on the industry choice, while $W(r \mid i)$ depends on the ITC choice given that the industry applies. Under the conditional probability model,

$$V_{A_1} = W(Not\ Apply) = -\alpha' y$$
$$V_{A_2} = W(Positive \mid Apply) + W(Apply) = (1-\sigma)\beta' X$$
$$V_{A_3} = W(Negative \mid Apply) + W(Apply) = 0,$$

where outcome A_1 depends only on the explanatory variables that affect the industry decision (y's), while outcome A_2 depends on explanatory variables that affect both the industry decision and the ITC decision (both y's and X's). [31]

For the multinomial logit model with three alternatives, the decision to apply itself does not independently add any additional utility to the final strict utilities (V_{ri}) of any out-

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31. Note that the utilities are normalized such that $V_{A_3} = 0$. That is, $W(Apply) = 0$ and $W(Negative \mid Apply) = 0$.

come. So the utilities have the forms:

$$V_{A_1} = W(\textit{Not Apply}) = -\alpha' y$$

$$V_{A_2} = W(\textit{Positive} \mid \textit{Apply}) = (1-\sigma)\beta' X$$

$$V_{A_3} = W(\textit{Negative} \mid \textit{Apply}) = 0.^{32}$$

The purpose of the Hausman test is to determine whether the coefficients (the β's) from the conditional choice model given two alternatives, A_2 and A_3, are the same as the corresponding coefficients from the three alternative multinomial logit model (MNL). Under the unconditional multinomial logit structure, the probabilities have the form:

$$P(A_1) = \frac{e^{\alpha' y}}{1 + e^{\beta' X} + e^{-\alpha' y}}$$

$$P(A_2) = \frac{e^{\beta' X}}{1 + e^{\beta' X} + e^{-\alpha' y}}$$

$$P(A_3) = \frac{1}{1 + e^{\beta' X} + e^{-\alpha' y}}.$$

Alternatively, conditioning on an industry's decision of whether or not to apply, the probabilities of getting protection or getting turned down (i.e. a positive or negative decision by the ITC) under the nested logit structure are given by

$$P(A_2) = \frac{1}{1 + e^{-\beta' X}}$$

$$P(A_3) = \frac{e^{-\beta' X}}{1 + e^{-\beta' X}}.$$

The null hypothesis is that the coefficients of the independent variables that explain the agency's decision (the β's) are the same under both model specifications. That is

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32. Again the utilities are normalized such that $V_{A_3} = 0$.

H_o : $\beta^{MNL} = \beta^{Nested\ Logit}$. Acceptance of H_o would imply that industry decisions do not affect the final outcomes. This would mean, for example, that the unconditional probability of a positive ITC ruling (MNL) is equivalent to the conditional probability of a positive decision (Nested Logit). Hausman and McFadden show that if the IIA property holds, then $\underset{N \to \infty}{plim}(\beta^{MNL} - \beta^{Nested\ Logit}) = 0$. The standard test statistic developed by Hausman is given by $T \equiv (\beta^{MNL} - \beta^{Nested\ Logit})'[Cov(\beta^{MNL}) - Cov(\beta^{Nested\ Logit})]^{-}(\beta^{MNL} - \beta^{Nested\ Logit})$, where $Cov(\beta^{MNL})$ is the covariance matrix for the unconditional multinomial logit model and $Cov(\beta^{Nested\ Logit})$ is the covariance matrix for the conditional model of ITC choice. The statistic T is distributed χ_r^2 where r is the rank of the covariance matrices.

Table 5 shows the results under the multinomial logit model. The coefficients of the X's are compared with the coefficients from the conditional model given in Table 4. Using the Hausman test, T = 101.228 which is distributed χ_9^2. The probability of this occuring for the given data is less than .005. Therefore, H_o is rejected at the 1% level. It follows that the model based on the multinomial logit structure is not correctly specified, thus the nested logit model is accepted as the more valid representation of the observed data.

Finally, the issue of labor intensity was addressed by including the ratio of employment over value of shipments in the model. In Table 6, labor intensity is added as an explanatory variable under democratic versus republican leadership in the White House. Neither the supply nor the demand for protection appear to be significantly related to labor intensity, even when the democrats control the White House. This result supports the findings of Basevi (1966) and Cheh (1976), over earlier results, that labor intensive industries are not more likely to be protected than capital intensive ones.

Table 5

MULTINOMIAL LOGIT MODEL

Logit Estimations of the Three Alternative Choice Model
Dependent variable: final outcome: 0 = apply/no protection, 1 = not apply, 2 = apply/protection

Value	Count	Percent
0	125	4.34
1	2675	92.88
2	80	2.78

total number of observations 2880

Independent Variable	Estimated Coefficient	t-Statistic
Independent Variables (X's) Affecting ITC Decisions:		
Constant	-1.39	-1.64*
Elasticity of Demand	-0.66	-3.46***
Industry Concentration Ratios	-5.44	-0.75
Industry Employment	7.17	7.80**
Percentage Change in Industry Employment	-1.50	-1.03
Percentage Change in Market Share	0.51	0.93
Capacity Utilization	-1.32	-1.46
Tariff Rate	1.40	1.52
U.S. Trade Deficit	7.99	2.32**
Independent Variables (y's) Affecting Apply Decisions:		
Constant	-2.54	-9.15**
Concentration Ratios	-1.87	-4.20**
Percentage Change in Industry Employment	-1.19	-1.37
Percentage Change in Market Share	-0.32	-0.77
Tariff Rate	-1.57	-2.67**

percent correctly predicted = 92.88

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* signifies a 10 % significance level.
** signifies a 5% significance level or better.
*** This is significant but opposite in sign from that predicted by Becker's model.

Table 6

NESTED LOGIT MODEL (including labor intensity as a function of presidential party)

Logit Estimations of the Determinants of ITC Decisions
Dependent variable: ITC decision: 1 = protection, 0 = no protection

Value	Count	Percent
0	125	60.98
1	80	39.02

total number of observations 205

Independent Variable	Estimated Coefficient	t-Statistic
Constant	-1.04	-0.90
Elasticity of Demand	-0.41	-1.39
Industry Concentration Ratios	-5.62	-0.79
Industry Employment	2.40	1.85*
Percentage Change in Industry Employment	-1.19	-0.71
Percentage Change in Market Share	6.07	1.53
Capacity Utilization	-8.22	-0.61
Tariff Rate	1.78	1.49
U.S. Trade Deficit	1.05	2.01**
Labor Intensity-Under Democrats	-2.26	-0.96
Labor Intensity-Under Republicans	-1.99	-1.09

percent correctly predicted = 65

Logit Estimation of the Determinants of Industry Decisions
Dependent variable: Industry decision: 1 = apply, 0 = do not apply

Value	Count	Percent
0	2698	92.94
1	205	7.06

total number of observations 2903

Independent Variable	Estimated Coefficient	t-Statistic
Constant	-2.12	-9.24**
Industry Concentration Ratios	-3.48	-0.97
Percentage Change in Industry Employment	-1.09	-1.56
Percentage Change in Market Share	-0.59	-1.66*
Tariff Rate	-1.20	-2.58**
Labor Intensity-Under Democrat	-6.03	-0.94
Labor Intensity-Under Republican	4.42	1.51
Inclusive Value	0.12	1.72*

percent correctly predicted = 92.94

Results

The estimation results above demonstrate the importance not only of considering both the supply of and demand for regulation but also of accounting for the problem of self-selection among the industries. The results show that we cannot reject the hypothesis that industries may be aware of certain aspects of the regulatory commission's behavior when making their decisions and that they may use this information in a utility maximizing fashion. Thus, we adopt the nested logit model to account for the behavior of industries in choosing whether or not to file an application with the ITC.

Because of this problem of sample selection, much of the scholarly work done on predicting either the demand for or supply of protection may be biased. For example, Goldstein and Takacs each look at the supply of regulation by the ITC and claim, from their analyses, that protectionist pressures do not affect government policies. What each of these studies fails to account for is that the group of petitioners may have common unobservable characteristics that lead them to apply in the first place. For Goldstein, the fact that the acceptance rate of petitions has not changed over time may merely mean that the characteristics of the pool of applicants has not changed, not that policy makers have been unaffected by protectionist pressures. And, Takacs' claim that the government does not respond to protectionist pressures may be the result of inaccurate predictions about the demand for protection, or the factors that drive industries to file petitions. Both models can be improved upon to predict more accurately the effect of protectionist pressures on policy outcomes. On a more micro-level, the results in Table 2 above indicate that pressure groups may indeed affect outcomes; both size (measured by employment) and the type of petitioner (single firms or groups of firms) seem to be good predictors of ITC behavior.

Furthermore, by far a vast majority of the literature, both on trade regulation in general and on the ITC in particular, focuses only of one side of the problem. Many factors have been identified to explain the supply of and demand for protection, but by isolating and examining only one side of the problem at a time, many seemingly false or contestable conslusions have been drawn by the authors. A common thread in all of the ITC specific studies on trade regulation is that the agency is not affected by and does not respond to political pressures. This work challenges that result by clearly demonstrating the importance of the problem of self-selection.

Finally, recall that the theoretical groundwork for this study is Becker's pressure group model of regulation. The major theme of the Becker model is that regulators behave efficiently by choosing the most efficient outcomes; that is, they grant regulation which provides a given benefit to a subsidized group with the least deadweight loss to society. This notion of efficient policy choice drives the whole regulatory system in Becker's work.

The results presented above, however, may lead one to question the foundation of Becker's model. The analysis shows that one very important regulatory agency, the ITC, may not choose policies with the least deadweight loss to society. Indeed, we cannot reject the hypothesis that they grant protection to industries when the deadweight loss is higher than it would be from protecting those that are turned away. This result should cast doubts on the notion that regulators do not favor the desires of pressure groups over what is better for society as a whole.

CONCLUSION

The purpose of this work has been to explain the varying levels of protection across industries by focusing on factors that affect both the supply of and demand for the regulation of trade. Both circumstances that lead industries to request protection, and factors that affect the government's decision of whether or not to supply that protection have been examined. Industries and the government presumably have incentives to pursue utility-maximizing courses of action. On the demand side, when an industry seeks a higher tariff, the benefits from that tariff presumably outweigh the costs of applying and lobbying for protection. On the supply side, when the government chooses to protect an industry, the political benefits in terms of, for example, votes or contributions presumably exceed the costs in terms of the lost support from those harmed by the policy. A major problem of the literature on both the International Trade Commission and the regulation of trade in general has been a failure of scholars to account for both the supply and the demand sides of the regulatory issue. In other words, what factors best explain the actions of interest groups and the decisions of regulators? This study tests for the potential problem of industries self-selecting themselves when seeking regulation, or making their decisions by taking into account what they perceive the ITC's decision will be.

The problem of self-selection is dealt with by modeling ITC outcomes with a nested structure (the nested logit model) where the final outcome depends on both industry choice and agency choice. The industries (demanders) face the binary choice of whether or not to undergo the costs of applying and pressuring the regulators for trade protection. The International Trade Commission (the supplier) makes the binary decision of whether or not to grant regulatory benefits to each of the applicants based on industry characteristics and political factors. This work demonstrates that self-selection is a problem in predicting the probability of an

industry getting protection; that is, industries do appear to self-select themselves when deciding whether or not to apply for protective tariffs.

By comparing the utility of not applying with the maximum expected utility that can be derived from filing an application, an industry can make a rational decision as to the usefulness of its seeking protection from the ITC. By observing ITC behavior, an industry acquires some information about the value of its filing an application. This implies that those industries that believe their requests will probably be rejected will not bother to apply, since their expected utility from applying will be lower than the utility that they derive from not applying. Thus the applicant pool is not a random sample of industries. The probability that ITC outcomes are independent of industry choice (the property of independence of irrelevent alternatives or IIA) is rejected at the 1% level under the Hausman-McFadden specification test for multinomial logit. The nested logit structure is thus accepted as a representation of the observed phenomena more valid than previous models.

Self-selection by the industries demonstrates the potential problems with the existing literature on regulation by the International Trade Commission. Scholars, failing to account for the selectivity problem in modeling the agency's decisions, have drawn false or misleading conclusions about the behavior of the ITC and about the factors that influence ITC choices. Contrary to the conclusions of many ITC-specific studies on the regulation of trade, the analysis presented here indicates that pressure groups do have some influence on the decisions of policy makers. This study also shows that regulators may respond positively to the interests of pressure groups even when their policy choices are not efficient in terms of the deadweight loss to society. These findings lead to new avenues for future research into the questions of how interest groups might influence regulators and what effects their pressuring might have on policy outcomes.

Both the type of petitioner and the size of industries appear to be good predictors of ITC behavior, but none of the many industry-specific variables that measure an economic need for regulation seem to explain the agency's actions. We need to look deeper into the politics of regulation by the ITC in order to better understand what drives an industry to apply for protection and what determines whether or not an industry will be granted protection. Because the ITC is an agency created and both funded and reauthorized annually by Congress, this should necessarily entail a look at Congress and its possible influence on the behavior of the International Trade Commission.

A well-known body of literature exists that incorporates institutions, particularly Congress, into the study of regulation. See for example, the works of Shepsle and Weingast (1984) or Weingast and Moran (1983). Though their theory of "Congressional Dominance," as it is called, has not previously been given attention in this work, it is important to discuss its significance here. Typically in these studies, the influence of Congress on agency decisions has been measured by such things as the liberal-conservative voting scores of Congressmen constructed by Americans for Democratic Action (ADA scores), the ADA ratings of the relevant committee(s) and its chairman, or the political party make-up of the committee(s) that oversees the agency. (In this area, it is the Ways and Means Committee, in particular the Trade Subcommittee, which has jurisdiction over trade matters.) Also, the party of the President has been used to account for presidential influence over policy outcomes of agencies.

This type of analysis, however, presents problems in this work for two important reasons. First, because of the nature of trade legislation, it is difficult, if not impossible, to determine how a given member of Congress or the President stands on the issue of granting protection merely by considering his political party affiliation or ADA rating. Though generalizations have been made, neither party identification nor liberal-conservative measures of voting

behavior seem to accurately predict whether or not protection or free trade will be the preferred outcome. Historically, because they face a national constituency, both Democratic and Republican Presidents have favored, or at least purported to favor, free trade. Furthermore, Congressmen of both parties or political leanings have been on both sides of the protection-free trade issue. For example, in 1982, the Carribbean Basin Initiative Bill (HR 7397) came before the floor of the House of Representatives for a vote. Several amendments were allowed under the rule including one by Democrat Richard Gephart to protect tuna and one by Republican Larry Hopkins to protect tobacco.[33] Though these amendments can be interpreted as mere position-taking stances on the part of these Congressmen for the sake of satisfying constituent requests or demands, instances of such behavior abound. Thus one might question whether other factors besides party afiliation might not be better indicators of where members of Congress stand on trade issues. The difficulty of determining how congressmen stand on the issue of protectionism by their party identification is even more pronounced if one looks at congressional behavior over time. Republicans were historically more protectionist than Democrats, but factors such as the pressures of rising unemployment have blurred this distinction. In fact, it appears that Democrats take a protectionist stance more often than Republicans today.

Secondly, because many changes have been made in the legislation governing the ITC since its creation, it is very difficult to undertake a time series study that allows for variation in the make-up of relevant congressional committees and changes in committee chairmen or presidents. The rules under which the ITC operates have been fairly stable since 1974 which is why the period from 1975 to 1984 was chosen for this study. In this period, however, the Ways and Means Committee membership underwent relatively little change. By party

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33. *Congressional Quarterly Almanac*. (CQ inc. Washington D.C., 1982), pp. 151-56.

identification, the membership has only varied by a few percentage points from one year to the next--the percentage of Democrats on the committee had a range of only 65% to 67% over the ten year time period covered in this study. Also, the chairmanship was fairly stable, changing only once in the ten year period; the change occurred in 1981 when chairmanship switched from Democrat Al Ullman to Democrat Dan Rostenkowski. Because of this stability, it is difficult to draw conclusions about what effects, if any, party identification might have on trade policy outcomes. But at the same time, extending the time period of the study would not solve the problem of member stability because from 1962 to 1974 more stringent requirements for granting protection were governing the ITC. This different set of rules is probably responsible for severely restricting the number of applications that were received by the Commission in the 1960s and early 1970s. Under a different set of rules, a different set of criteria may have been used by industries in deciding whether or not to file an application. Thus, pooling data from after 1974 with data prior to that year would likely lead to biased conclusions.

Because of the difficulties of dividing Democrats and Republicans (or liberals and conservatives) on the issue of protection versus free trade, and because of the problems that emerge in studying ITC behavior over longer time periods, the traditional means of measuring Congressional or Presidential influence could not be effectively used in this work. Alternatively, incorporating political institutions into a study of the ITC requires a new or different focus and means of accounting for a possible relationship between Congress or the President and the behavior of the regulators on the Trade Commission.

On the surface, it is evident that both Congress and the President can influence the ITC and do. Congress changes the rules under which the ITC operates and the President can modify a decision made by the ITC. Focusing in particular on congressional influence, it is apparent that changes in the rules have had a great effect on how many petitions have been

filed and perhaps also on which industries have filed petitions. If, as evidence suggests, industries do base their decisions to apply (or not) on their perception of the behavior of the ITC, then the rules and changes in those rules will surely affect the final outcomes.

But besides just changing the rules or modifying the results, there may be other ways in which Congress or the President may influence the final decisions of the Commission. One possibility not covered in this work, nor explored in the literature, is to look more closely at the location of industries in relation to congressional power. For example, industries which are concentrated in districts whose congressmen have more political power or influence may apply more often to the ITC, and may be more likely to be granted protection by this regulatory agency. By looking at geographic concentration and location of industries, as well as other region-specific factors like unemployment, union activity, or industrial shipments perhaps we can better predict whether or not an industry will apply for protection and whether or not the ITC will respond favorably to its demands. My future research will examine the relationship of Congress and the President to the International Trade Commission and what effect, if any, they have on decisions that are made by the ITC. By looking at these alternative avenues of influence, perhaps we can better understand the role of political institutions in the regulation of trade by the United States.

APPENDIX A

Key Trade Legislation

1789 Tariff Act: first tariff act.

1909 Payne-Aldrich Tariff Act: maximum-minimum clause introduced.

1913 Underwood Tariff Act: maximum-minimum clause cancelled; major downward revision of tariff rates; first income tax law imposed.

1916 U.S. Tariff Commission created.

1922 Fordney-McCumber Tariff Act: Reinstated higher tariffs of 1909 level; flexible tariff provision enacted giving President power to revise tariff rates up or down by 50% following a Tariff Commission investigation; gave Tariff Commission the duty to investigate the following: flexible tariff cases (under section 313), cost of production cases (section 315), unfair practices cases (section 316), and discrimination cases (section 317).

1930 Smoot-Hawley Tariff Act: Congress enacted highest tariff rates in U.S. history.

1934 Reciprocal Trade Agreements Act: authorized the President to negotiate reciprocal trade agreements to reduce Smoot-Hawley rates by up to 50% without requiring prior Tariff Commission investigations.

1937-45 Reciprocal Trade Agreement Act was renewed with same basic structure.

1945 Trade Agreements Expansion Act replaces Reciprocal Trade Agreement Act and allows additional 50% reductions in tariff rates from existing levels.

1947 GATT created; escape clause provision agreed to by negotiating countries that signed GATT.

1948-62 Trade Agreements Extension Act renewed.

1948 Tariff Commission authorized to conduct Peril Point Investigations.

1949 Peril Point repealed. Reinstated in 1951 and continued until 1962.

1951 Tariff Commission ordered by Congress to investigate escape clause cases.

1955 Tariff Commission given duty to investigate Antidumping cases.

1962 Trade Expansion Act: Peril Point repealed; Additional 50% reductions in tariff duties allowed under Presidential negotiation; Adjustment Assistance investigations begun by

Tariff Commission under section 301 of Trade Act.

1974 Trade Act: Tariff Commission renamed ITC; Countervailing Duty Investigations begun by the ITC; Adjustment Assistance Investigations turned over to Departments of Commerce and Labor.

APPENDIX B

Derivation of Domestic Elasticities of Demand

Cournot aggregation is defined by Deaton and Muellbauer (1980) as a restriction on the derivative of the demand function. Given a demand function, $q_i = g_i(x, p)$ where i denotes the set of goods, i = 1 to n, with prices p_1 to p_n, and income x then the budget constraint implies that

$$\sum_k p_k g_k(x, p) = x.$$

Differentiating this constraint on the functions g_i with respect to p_i gives

$$\sum_k \partial/\partial p_i [p_k g_k(x, p)] = \sum_{k=1}^{n} p_k \frac{\partial g_k(x, p)}{\partial p_i} + q_i = 0.$$

It can be shown that this is equivalent to $\sum_k w_k e_{ki} + w_i = 0$ where budget shares, w_i are defined by $w_i = p_i q_i / x$ and e_{ki} is the cross-price elasticity of demand defined by $e_{ki} = \partial \log g_k(x, p) / \partial \log p_i$.

When k = i, then e_{ki} is the own price elasticity of demand for good i.

By definition,

$$\sum_k w_k e_{ki} + w_i = \sum_k \left[\frac{p_k q_k}{x} \frac{\partial \log g_k(x, p)}{\partial \log p_i} \right] + \frac{p_i q_i}{x} = 0.$$

So

$$\frac{1}{p_i} \sum_k \left[p_k q_k \frac{\partial \log g_k(x, p)}{\partial \log p_i} \right] + q_i = 0.$$

But

$$\frac{q_k}{p_i} \left[\frac{\partial \log g_k(x, p)}{\partial \log p_i} \right] = \frac{q_k}{p_i} \left[\frac{\partial \log g_k(x, p)}{\partial g_k(x, p)} \right] \left[\frac{\partial g_k(x, p)}{\partial \log p_i} \right]$$

$$= \frac{1}{p_i} \left[\frac{\partial g_k(x, p)}{\partial \log p_i} \right] = \left[\frac{\partial \log p_i}{\partial p_i} \right] \left[\frac{\partial g_k(x, p)}{\partial \log p_i} \right] = \frac{\partial g_k(x, p)}{\partial p_i}.$$

Therefore, $\sum_k p_k \frac{\partial g_k(x,p)}{\partial p_i} + q_i = 0.$

Now assume that only two goods exist, the imported good IG and the domestic good DG, where total demand is the sum of import and domestic demands and the budget shares for these goods satisfy $w_{IG} + w_{DG} = 1$. Using $\sum_k w_k e_{ki} + w_i = 0$, then the following is true for $k = IG$ and $i = DG$:

$$w_{IG} e_{IGDG} + w_{DG} e_{DGDG} + w_{DG} = 0.$$

Solving for the own price elasticity of domestic demand, e_{DGDG} gives

$$e_{DGDG} = \left[-w_{DG} - w_{IG} \frac{e_{IGDG}}{w_{DG}} \right]$$

where w_{IG} is the import share, and $e_{IGDG} \equiv e_{DGIG}$ is the cross price elasticity of DG and IG. So given the cross price elasticities and the import shares for the industries estimated by Shiells, et al. (1985) the domestic elasticities of demand can be easily calculated.

APPENDIX C

List of Variables

Variable Name	*Description*
ITC Decision	Dummy for ITC decision whether or not to grant protection
Apply Decision	Dummy for industry decision whether or not to apply for protection
Concentration Ratio	Percent of production accounted for by the four largest firms measured by industry at four digit SIC level
Capacity Utilization	Plant capacity utilization measured at four digit SIC level
Elasticity	Elasticity of Demand measured by industry at three digit SIC level
Trade Deficit	Yearly measure of the U.S. Trade Deficit
%Δ GNP	Yearly measure of the change in U.S. GNP
Union	Dummy for union involvement in a petition to the ITC for import relief
Administration	Dummy for an administration initiated or backed petition
Multiple Petitioner	Dummy for a petition by a group of firms
Single Petitioner	Dummy for a petition by a single firm
Tariff	Tariff Rate by industry measured at three digit SIC level
Employment	Number of employees by industry measured at four digit SIC level
Non-Tariff	Dummy for industries with non-tariff barriers to trade
Market Share	Share of the domestic market held by U.S. industries
Exports	Value of Exports by industry measured at four digit SIC level
Imports	Value of Imports by industry measured at four digit SIC level
Shipments	Value of Shipments by industry measured at four digit SIC level
%Δ Market Share	Percentage change in market share held by U.S. industries

%Δ Imports	$\frac{Imports(t)-Imports(t-1)}{Imports(t-1)}$
%Δ Employment	$\frac{Employment(t)-Employment(t-1)}{Employment(t-1)}$
%Δ Shipments	$\frac{Shipments(t)-Shipments(t-1)}{Shipments(t-1)}$
Ratio	$\frac{Imports}{Imports + Shipments}$
INCV	$\log(\exp(\beta' X) + 1)$

APPENDIX D

Descriptive Statistics of the Variables

Table 7

VARIABLE STATISTICS FOR ALL INDUSTRIES--2903 CASES

Variable	Mean	Minimum	Maximum	Standard Deviation
*ELAS**	-1.11	-3.86	0.08	0.45
CONS	40.79	4.0	100.0	21.03
CAP	70.37	20.0	100.0	12.87
EMP	45.49	1.30	528.3	66.18
PRCHGEMP	-0.007	-0.47	7.74	0.18
PRCHGMKT	-0.008	-4.39	8.36	0.22
TARIFF	36.05	0.0	114.5	16.51

Table 8

VARIABLE STATISTICS FOR APPLICANTS--202 CASES

Variable	Mean	Minimum	Maximum	Standard Deviation
ELAS	-1.18	-2.88	0.08	0.52
CONS	39.33	7.0	98.0	22.69
CAP	68.91	29.0	97.0	11.72
EMP	88.09	1.30	505.4	122.2
PRCHGEMP	-0.023	-0.31	0.47	0.098
PRCHGMKT	-0.012	-1.54	0.24	0.12
TARIFF	33.32	6.7	66.41	14.17
TRDEF	36.25	-9.2	110.93	32.14

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* The variable names for the abbreviations are as follows: *ELAS* ≡ elasticity, *CONS* ≡ concentration, *CAP* ≡ capacity utilization, *EMP* ≡ employment, *TRDEF* ≡ trade deficit, *TARIFF* ≡ tariff rate, *PRCHGEMP* ≡ %Δ employment, and *PRCHGMKT* ≡ %Δ domestic market share.

Table 9

CORRELATIONS AMONG VARIABLES FOR ALL INDUSTRIES--2903 CASES

	APPLY	*ELAS*	*CONS*	*CAP*	*EMP*	*PRCHGEMP*	*PRCHGMKT*	*TARIFF*
APPLY	1.00	-0.048	-0.017	-0.029	0.174	-0.024	-0.005	-0.045
ELAS		1.00	-0.023	0.011	-0.003	-0.079	0.001	-0.048
CONS			1.00	0.009	-0.145	-0.031	0.004	-0.018
CAP				1.00	0.07	0.106	-0.02	-0.04
EMP					1.00	0.048	-0.001	-0.069
PRCHGEMP						1.00	-0.004	0.00004
PRCHGMKT							1.00	-0.005
TARIFF								1.00

Table 10

CORRELATIONS AMONG VARIABLES FOR APPLICANTS--202 CASES

	DEC	*ELAS*	*CONS*	*CAP*	*EMP*	*PRCHGEMP*	*PRCHGMKT*	*TARIFF*	*TRDEF*
DEC	1.00	-0.108	-0.083	-0.056	0.156	-0.016	0.095	0.110	0.146
ELAS		1.00	-0.068	-0.084	0.069	-0.104	-0.111	-0.095	-0.002
CONS			1.00	0.080	-0.202	-0.053	-0.049	-0.109	-0.055
CAP				1.00	-0.015	0.182	-0.012	-0.030	-0.081
EMP					1.00	0.016	0.017	0.123	-0.010
PRCHGEMP						1.00	0.011	0.076	0.079
PRCHGMKT							1.00	0.14	-0.21
TARIFF								1.00	-0.092
TRDEF									1.00

APPENDIX E

Computations of the Probabilities for the Nested Logit Model

The strict utilities of the three possible outcomes specified by Diagram 5 are defined by:

$$V_{A_1} = \log Y_1 = -\alpha' y$$
$$V_{A_2} = \log Y_2 = (1-\sigma)\beta' X$$
$$V_{A_3} = \log Y_3 = 0.$$

Furthermore, we know that conditional on choosing one of the alternatives A_2 and A_3, the probability of an industry getting protection has the binomial logit form:

$$P(A_2 | A_2, A_3) = \frac{Y_2^{\frac{1}{1-\sigma}}}{Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}}}$$

which, after substitution, becomes

$$P(A_2 | A_2, A_3) = \frac{e^{\frac{(1-\sigma)\beta' X}{1-\sigma}}}{e^{\frac{(1-\sigma)\beta' X}{1-\sigma}} + 1}$$

$$= \frac{e^{\beta' X}}{e^{\beta' X} + 1} = \frac{1}{1 + e^{-\beta' X}}.$$

The probability of applying is given by

$$P(A_2, A_3 | A_1, A_2, A_3) = \frac{\left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}}{Y_1 + \left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}}.$$

Substitutions similar to those above lead to:

$$P(A_2, A_3 | A_1, A_2, A_3) = \frac{\left[e^{\frac{(1-\sigma)\beta'X}{1-\sigma}} + 1 \right]^{1-\sigma}}{e^{-\alpha' y} + \left[e^{\frac{(1-\sigma)\beta'X}{1-\sigma}} + 1 \right]^{1-\sigma}}$$

$$= \frac{\left[e^{\beta'X} + 1 \right]^{1-\sigma}}{e^{-\alpha' y} + \left[e^{\beta'X} + 1 \right]^{1-\sigma}}$$

$$= \frac{e^{(1-\sigma)\,INCV}}{e^{-\alpha' y} + e^{(1-\sigma)\,INCV}} = \frac{1}{1 + e^{-[\alpha' y + (1-\sigma)INCV]}}$$

where the inclusive value is defined as INCV $\equiv \log\left[e^{\beta'X} + 1 \right]$.

Finally, the unconditional probability of outcome A_2 can be rewritten as:

$$P(A_2 | A_1, A_2, A_3) = P(A_2 | A_2, A_3)\, P(A_2, A_3 | A_1, A_2, A_3)$$

$$= \frac{Y_2^{\frac{1}{1-\sigma}}}{Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}}} \cdot \frac{\left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}}{Y_1 + \left[Y_2^{\frac{1}{1-\sigma}} + Y_3^{\frac{1}{1-\sigma}} \right]^{1-\sigma}}$$

$$= \frac{e^{\beta'X}}{e^{\beta'X} + 1} \cdot \frac{e^{(1-\sigma)\,INCV}}{e^{-\alpha' y} + e^{(1-\sigma)\,INCV}}$$

$$= \frac{1}{1 + e^{-\beta'X}} \cdot \frac{1}{1 + e^{-[\alpha' y + (1-\sigma)INCV]}} \cdot$$

APPENDIX F

Proof of Footnote 29

We need to show that in the limit, as σ goes to 1,

$$e^{V_{A_1}} + \left[e^{\frac{V_{A_2}}{1-\sigma}} + e^{\frac{V_{A_3}}{1-\sigma}} \right]^{1-\sigma} = e^{V_{A_1}} + \max\left[e^{V_{A_2}}, e^{V_{A_3}} \right].$$

Proof:

$$\lim_{\sigma \to 1} e^{V_{A_1}} + \left[e^{\frac{V_{A_2}}{1-\sigma}} + e^{\frac{V_{A_3}}{1-\sigma}} \right]^{1-\sigma} = \lim_{\sigma - 1 \to 0} e^{V_{A_1}} + \left[e^{\frac{V_{A_2}}{1-\sigma}} + e^{\frac{V_{A_3}}{1-\sigma}} \right]^{1-\sigma}$$

$$= e^{V_{A_1}} + \lim_{z \to 0} \left[e^{\frac{x}{z}} + e^{\frac{y}{z}} \right]^{z}$$

where $z = (1-\sigma)$, $x = V_{A_2}$, and $y = V_{A_3}$.

Suppose $x \geq y$, then

$$\lim_{z \to 0} \left[e^{\frac{x}{z}} + e^{\frac{y}{z}} \right]^{z}$$

$$= \lim_{z \to 0} \left[e^{\frac{x}{z}} \cdot \left[1 + e^{\frac{y}{z}} \cdot e^{\frac{-x}{z}} \right] \right]^{z} = e^{x} \cdot \lim_{z \to 0} \left[1 + e^{\frac{y-x}{z}} \right]^{z} = e^{x}.$$

Similarly, $x < y$ implies that

$$\lim_{z \to 0} \left[e^{\frac{x}{z}} + e^{\frac{y}{z}} \right]^{z}$$

$$= \lim_{z \to 0} \left[e^{\frac{y}{z}} \cdot \left[e^{\frac{x}{z}} \cdot e^{\frac{-y}{z}} + 1 \right] \right]^{z} = e^{y} \cdot \lim_{z \to 0} \left[e^{\frac{x-y}{z}} + 1 \right]^{z} = e^{y}.$$

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