Tariff Creation and Tariff Diversion in a Customs Union:

The Endogenous External Tariff of the EEC, 1968-1983

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Revised 1/20/97

Presented at the Conference on Pressure Groups,
Self Regulation and Collective Decision Mechanisms
Milan, Italy January 10, 1997

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1. Introduction

What are the welfare effects of international trade after a customs union is formed? Viner (1950) and Meade (1955) discovered two effects, called “trade creation” and “trade diversion.” Trade creation increases welfare because intra-union trade expands with the abolition of tariffs on imports from member-

countries. Trade diversion decreases welfare because importers switch from low-priced world sources to higher priced member country sources after tariffs drop to zero on intra-union trade.

How does the common external tariff evolve after a customs union is formed? We suggest that through time, the endogenous common external tariff will rise because of "tariff creation" and fall because of "tariff diversion." While the Viner-Meade literature was about normative welfare effects, this paper is a positive analysis describing the evolution of the common external tariff after a customs union is formed.

Recent work on economic integration with endogenous protection by Bhagwati(1993), Grossman and Helpman(1995), Melo, Rodrick and Panagariya(1993), Panagariya and Findlay(1996) and Richardson(1993,1994,1995) have mixed results on whether a customs union is more protectionist than the former individual countries. Grossman and Helpman(1995) argue plausibly that free trade areas are most likely if they enhance protection. Increased protection also seems likely for a customs union.

The data analyzed in this paper indicates that the creation of the EEC led to inconsequential increases in protection against nonmembers. These results are summarized in Section 9 of the paper, page 26. This paper estimates Lee and Magee's(1996) model of endogenous free-riding, which is an extension of Brock and Magee's(1977,1978) papers on endogenous free riding and endogenous protection.[2] Lee and Magee showed how endogenous free riding in protectionist lobbies can be modelled as a mixed-strategy equilibrium. We use this model to measure the tariff-creating and tariff-diverting changes from 1968-1983 in the common external tariff following creation of the EEC in 1968. We proxy pre- and post-EEC industry conditions using data from two of the three largest countries in the EEC (France and Italy).

We define "tariff diversion," to be the post-customs union decline in the endogenous common external tariff. This can happen for two reasons. First, tariff diversion occurs because of increased free

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[1] The authors are indebted to Gyeong L. Cho for research assistance in the preparation of this paper and to Gordon Hanson, Subal Kumbhakar and Chrys Dougherty for helpful comments on earlier drafts. The authors are rresponsible for remaining errors.

[2] For a discussion of the 1977 paper on endogenous free riding, see Magee, Brock and Young, 1989, Appendix to chp. 6, pp. 278-291.

riding. Resources will be diverted away from industry lobbying for protection because import-competing firms have moved from small countries to the larger political entity of the customs union. Lobby free riding increases because of the much larger number of import-competing firms pressuring for protection. This tariff diversion effect should cause the external tariff in each industry to fall below the pre-customs union average of country tariffs. Following Richardson(1994) and others, we also expect the long-run external tariff in a customs union to be lower than the average tariff for the same countries in a free trade area.[3] Second, a customs union promotes growth, increased efficiency and prosperity. The "compensation effect" from endogenous tariff theory predicts that increased prosperity increases the opportunity cost of resources expended on lobbying so that import-competing firms will decrease their lobbying for a higher common external tariff.[4]

We define "tariff creation" to be the post-customs union increase in the endogenous common external tariff. Import-competing firms within the union face greater competition than before because tariffs have been reduced to zero on intra-union trade. This generates two tariff-creating effects. First, the competitive pressure of greater imports forces import-competing firms that are below optimum firm size to merge into larger firms in the union. This increase in firm concentration reduces lobby free riding and thus increases lobbying for protection. This provides a partial offset to the decreased concentration effect of tariff diversion discussed above. Second, the increased economic hardship from free intra-union trade will cause import-competing firms to lobby harder for political relief, again, via the compensation effect. Following Panagariya and Findlay (1996), this protectionst lobbying can only be directed toward the common external tariff of the union, since protection against intra-union trade was eliminated by the formation of the union.

Whether tariff creation or tariff diversion will predominate is an empirical question. The formation of the European Economic Community (EC) is a good experiment. The common external tariff set in 1968 was a simple average of the pre-existing tariffs of the six member countries[5,6] -- Belgium,

[3] We take as exogenous the formation of the preferential trading area itself. The next section discusses the endogeneity of customs union formation itself.
[4] See Magee, Brock, and Young (1989, chp11).
[5] See Lasok and Cairns (1983, p.143).

Netherlands and Luxembourg plus Germany, France and Italy.[7] Thus, every change in the common external tariff from the inception of the EEC is, by definition, a change relative to the preunion average of country tariffs. Recall that we measure the tariff-creating and tariff-diverting effects on the common external tariff of the EEC between 1968 and 1983, using pre-EEC data from two of the three largest countries in the EEC, France and Italy.

We turn now to a review of the literature. Custom unions and free trade areas have been discussed widely in the press in recent years because of the regionalism versus globalization debate. That discussion grew out of the broader question of what defines a "country". Mundell (1961) defined a optimum currency area as a region within which there is factor mobility and between which there is not. Friedman (1977) introduced a 't-nation' as the largest political unit within which tax policy is effectively coordinated. According to this theory, countries exist to maximize total revenue, inclusive of the tax. Magee, Brock and Young (1989, chp 6) provide a general equilibrium model of endogenous protection with some speculations on whether country mergers would increase or decrease external protection. Krugman (1991a) says that political boundaries are relevant to the study of trade only if they are effective barriers to movements of goods and factors. Hanson (1994) says in his analysis of the North American Free Trade Agreement (NAFTA) that regions rather than nations should be the unit of analysis in international trade. Carneiro (1970) provides an interesting history of country formation, based on pre-Christian anthropological evidence.

There is a growing body of literature which applies endogenous policy theory to international trade. The application of the interest-group lobbying model with an emphasis on free riding in a setting of the private provision of a public good is especially relevant here. See Magee, Brock, and Young (1989)

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[6] GATT(1955) XXIV also stipulates, "..(paragraph) 8. For the purpose of this Agreement: (a) A customs union shall be understood to mean the substitution of a single customs territory for two or more customs territories, so that (i)... (ii) ..., substantially the same duties and other regulations of commerce are applied by each of the members of the union to the trade of territories not included in the union;..."

[7] The EEC, which became the main body of the EC, was created by the Treaty of Rome in 1957. The original six members were Belgium, the Netherlands, Luxembourg, Germany, France, and Italy. In 1973, Denmark, Ireland, and the United Kingdom joined. Greece followed them in 1981 and Spain and Portugal joined the EC in 1986. With the accession of Austria, Finland, and Sweden in 1995, the EC has become the European Union (EU) of 15 members. The tariff reduction started in 1959 and ended in 1968. The first EC census was published in 1963.

and Helpman(1995) for a survey of endogenous tariff theory and Magee (1997) for a survey of the empirical evidence.

Tharakan (1991) proposes a lobbying effect hypothesis that the lobbying power of professional associations representing industries having a higher degree of concentration is likely to be greater. In his study of the anti-dumping proceedings of the EC, the hypothesis is that the more concentrated an EC industry, which is the *de facto* plaintiff, the more likely is definitive anti-dumping duty, which is disadvantageous to the defendant exporting firms, and the less likely is price undertakings, which are more advantageous to the defendant exporting firms. Schuknecht (1991) also takes a similar approach in his study of EC protectionist policy, where the number of total complaints by member countries or the approval rate of a national protective measure are explained by political economic variables such as changes in the EC unemployment rate and the GDP growth rate of the EC.

A size-of-country-factor would lead us to expect that formation of a customs union would have a common external tariff that is lower than the average of the pre-union country tariffs. The reason is that there is a trade-off between the size of a country and its level of its protection. The more distant the circumscribing boundaries from the center of a country, the greater the natural economic protection from foreign goods. Therefore, large countries should have lower protection. Since the formation of a customs union is like the formation of a large country, the size-of-country-factor alone would predict an ultimate decline of the common external tariff of a customs union. This should be particularly true for the EEC since its initial external tariff was simply the average of the pre-customs union country tariffs.

2. The Endogeneity of EEC Formation

Whether the common external tariff of a customs union will rise or fall after union formation is part of a larger picture. Creation of a customs union itself is an endogenous. The formation of any

regional trade arrangement is a major change, meaning changes must have occurred in the exogenous determinants of the pre-existing equilibrium. Since the initial common external tariff of the EEC was a simple average of the previous country tariff rates, and tariffs on intra-EEC trade were cut to zero, the EEC experienced a large decline in average protection.

Thus, the EEC could have come into existence only if there was a pre-union decline in protectionist forces relative to pro-export forces and generalist voter sentiments in the member countries. Even if the protectionists could fully anticipate the post-union movements toward freer trade described in this paper, they could not prevent them if their relative power declines.

What forces led the six initial members of the EEC to merge? The most obvious explanations are geographic contiguity and the decreases in transport and information costs which have increased optimum country size world wide since World War II. But three other forces were at work, two suggested by the theory of endogenous protection and one by Mancur Olson.

The first endogenous tariff explanation of EEC formation is capital deepening. The physical capital structures of the EEC countries were especially devastated by World War II. The rapid rebuilding of both the physical and human capital structures of these countries greatly increased the size and political clout of the abundant factors relative to the scarce factor, unskilled labor. The endowment effect from endogenous protection suggests that increases in the ratio of the abundant to the scarce factor will decrease country tariffs. The EEC was one symptom of the decline in the political power of the scarce factor, labor.

A second explanation comes from the compensation effect of the theory of endogenous protection. A decrease in the terms of trade of a country is a decrease in the price of the country's exportables relative to its importables. This increase in the price of the country's importables on world markets means that import-competing firms face less competition from imports and hence will decrease their lobby efforts for protection. As of the first draft of this paper, we know only about the terms of trade changes for the United States. The US terms of trade for manufactures increased from an index of 82 in 1948 to 89 in 1958 to 104 in 1968, the year in which the EEC adopted the common external tariff. If the United States traded only with the EEC, then the EEC index would have been the mirror image of the United States and would have displayed terms of trade declines. However, it did not, so we can say

nothing definitive about the pre-EEC terms of trade changes. We can only speculate that if the pre-EEC terms of trade did decline, the higher relative price of imports would have reduced the political opposition of protectionists to the formation of the EEC.

A third potential explanation of EEC formation can be adapted from Olson(1982). Olson argued that cataclysmic political events such as World War II largely destroy the pre-existing interest group influence over governments in war torn countries. Protectionists are usually better organized than are the opponents of protectionism, consumers and proexport interests. Thus, World War II was disproportionately disadvantageous to protectionist interests in Europe. Further, the greatest political devastation occurred in Germany and Italy, the losers in the war, and considerable physical devastation occurred in France. These countries are the three principals of the EEC. The fact that the EEC opted for a customs union rather than the weaker political affiliation of a free trade area supports the Olson thesis.

With hindsight, the formation of the EEC is no surprise. Free trade areas are the usual means of trade integration. Recall that a customs union is a preferential trading arrangement within which members enjoy free trade and maintain a common external tariff.[8] A free trade area maintains free trade within but member countries maintain their own individual tariffs vis-à-vis nonmember countries. The EEC belongs to a typical customs union while the NAFTA is a free trade area. According to de la Torre and Kelly (1992), there exist about 34 PTAs and there are 19 prospective PTAs as of the end of 1991.[9] Table 1 reports the numbers by region.

Table 1

Regional Trading Blocs

	Existing Arrangements			Prospective Arrangements		
	FTA	CU	Other	FTA	CU	Other
Europe	8	1	1	7	1	1
Western Hemisphere	9	2		2		5
Africa	5	2	1			

[8] See Whalley (1996) for the reasons that countries seek preferential trade areas.
[9] See WTO (1995) for more recent regional arrangements notified to GATT.

Asia-Pacific and Middle East	2	2	1			3
Total	24	7	3	9	1	9

Source: de la Torre and Kelly (1992) Tables 1 - 4. Arranged.

Why the dominance of free trade areas? Richardson (1994) shows that a free trade area may be chosen over a customs union. In a FTA, domestic industries only need to lobby the national government for external tariffs, whereas in customs union they need to negotiate with larger government bodies to get the same level of tariff. It is free riding on the firms' side that shapes the protection level because free riding among firms are more severe under a customs union than under a free trade area, which makes the tariff under a customs union lower than that under a free trade area. Protectionist firms clearly prefer a free trade area over a customs union. Panagariya and Findlay (1996) show rather general conditions under which a customs union Pareto dominate a free trade area.[10]

Richardson (1994) argues that preferential trading arrangements can package tariff reductions that might not be accepted by individual sectors but which are, on aggregate, welfare improving. Also, a new regime with large changes in tariffs might be possible even when small changes would not be accepted on an individual basis if there were fixed costs of participation in politics. In this case, large changes could cover the fixed political costs and yield large welfare gains.

3. The Effects of Trade Creation and Trade Diversion on the Common External Tariff

There is a welfare gain from trade creation from a customs union but we find that this will be offset by a welfare loss from the associated tariff creation. Trade creation expands trade and increases welfare for a customs union because tariffs drop to zero on trade which is already from member countries. But this increase in trade harms import-competing firms in the union. This harm stimulates the

[10] Krueger (1995) argues that a FTA is dominated by a CU for two reasons. First, a CET of a CU is set between the high pre-CU level of a member A, and the low level of another member C, so that the post-CU tariff should not be increased after the CU, while FTA members do not change their pre-FTA levels. This lowered tariff under a CU forces the production of A to reduce, which creates trade (TC). In contrast, A's production is sustained under a FTA and thus, there is less TC. Second, it is costly to implement the rules of origin (ROO) under a FTA, which is necessary to prevent export circumvention via a partner country with lower external tariff rates. Taking this into consideration leads us to conclude that a FTA is likely to incur a greater welfare loss.

compensation effect[11] from endogenous tariff theory: import-competing firms will increase their lobbying efforts against these or other imports they compete with from nonmember countries. The resulting increase in the common external tariff will lower welfare. Thus, the welfare gains from trade creation will be partially offset by welfare losses from tariff creation.

Panagariya and Findlay (1994) have a related effect. A customs union will eliminate tariff lobbying for a good previously imported from a member country. Elimination of lobbying against member countries makes lobbying against non-member countries more attractive, which results in increased protection against the rest of the world.

Contrasted with the compensation effect is the result of Hillman (1982), Cassing and Hillman (1986), van Long and Vousden (1991), and Richardson (1993) that political support for domestic industries decreases with increased import competition, because the industry becomes smaller and weaker. According to this view, politics reinforces the downfall of declining industries rather than compensating for their economic disadvantage. Cassing and Hillman (1986) argue that decreasing government support for declining industries stops abruptly at a certain point. Brainard and Verdier (1994) modify this prediction and say that government protection fades out more gradually. Richardson (1993) shows in an endogenous tariff setting model that trade diversion is less severe in the case of an free trade area than in a customs union. The reason is that declining industries will simply face tariff elimination (following the insurance argument) so that tariff diversion may not occur.

Consider now the broader welfare question of trading blocs. Krugman (1991b) extends the optimal tariff discussion to explore the welfare consequences of trading blocs where blocs produce differentiated goods and affect world prices by setting optimal tariffs on imports from other blocs. Adding additional members to the trading bloc has a different effect on intra-bloc and extra-bloc welfare. The increasing size of a bloc allows a greater variety of products to be available duty-free within the bloc, but leads to higher optimal tariffs on inter-bloc trade. As a result, the welfare consequences of a movement towards the bigger sized trading blocs will depend on just how important within-bloc varieties are relative to varieties from outside the bloc.

[11] For a detailed discussion of the compensation effect, see Magee, Brock, and Young (1989), Chapter 11.

Yi (1994) analyzes the different effects of a customs union and a free trade area on the members and non-members by maximizing the aggregate welfare of countries involved, which consists of consumer surplus, domestic and export profits, and tariff revenue. The major results are supportive of the optimal tariff argument that the common external tariff of a customs union will rise and the individual tariff of free trade area will fall. These results depend crucially on the ability to exercise collective market power in setting external tariffs.

The General Agreement on Tariffs and Trade (GATT), whose aim is global trade liberalization, reserves room for regional trade arrangements. Article XXIV of the GATT permits regional trading blocs with some conditions and suggests that after-bloc tariffs should not be increased compared with the before-bloc average level.[12]

Bhagwati (1991,1993) and Krueger (1995) mention the coercive feature of trading blocs. A trading bloc is conducive to global free trade through its power to push countries to the negotiation table for multilateral trade cooperation in order to avoid potential retaliatory trade wars. However, it reduces world trade to the extent that it is tempted to exploit its monopoly power in world trade.

They compare the welfare implications of different types of preferential trading arrangements with endogenous protection. The free riding opportunism within a customs union makes the common external tariff of a customs union lower than a trade area members' national tariff levels. Further, the level of the

[12] Article XXIV (Territorial Application-Frontier traffic-Customs Unions and Free-trade Areas) of the GATT(1955) reads, "...(Paragraph) 4. (The contracting parties) also recognize that the purpose of a customs union or of a free-trade area should be to facilitate trade between the constituent territories and not to raise barriers to the trade of other contracting parties with such territories. 5. Accordingly, the provision of this Agreement shall not prevent, as between the territories of contracting parties, the formation of a customs union or of a free-trade area...; Provided that: (a) with respect to a customs union, or an interim agreement leading to the formation of a customs union, the duties and other regulations of commerce imposed at the institution of any such union or interim agreement in respect of trade with contracting parties not parties to such union or agreement shall not on the whole be higher or more restrictive than the general incidence of the duties and regulations of commerce applicable in the constituent territories prior to the formation of such union or the adoption of such interim agreement, as the case may be; (b) with respect to a free-trade area, or ..., the duties and other regulations of commerce maintained in each of the constituent territories ...shall not be higher or more restrictive than the corresponding duties and other regulations of commerce existing in the same constituent territories prior to the formation of the free-trade area, ...; and..."

common external tariff will be lower as the number of member countries increases in a customs union. In this sense, a customs union is Pareto-superior to a free trade area.

Thus, endogenous politics predicts that free trade areas would be more common while welfare analysis suggests that there should be more customs unions. Here politics appears to dominates welfare considerations. The evidence from de la Torre and Kelly (1992) in Table 1 indicates a total of 33 free trade areas compared to only 8 customs unions.

We can summarize this section as follows. The compensation effect predicts greater protection against imports from the rest of the world with trade creation. This arouses domestic opposition against imports from non-member countries as a compensation of lowered trade barriers among member countries. Trade diversion does not generate domestic lobbying because it occurs at the expense of non-member countries.[13] The declining-industry support theory predicts the opposite. [14] Namely, as trade creation increases, some national industries decline, which leads to weaker political support and thus, to a lower external tariff. There is a second reason to expect lower tariffs from trade creation. If a tariff increases with the share of non-customs union imports in consumption,[15] then the lowered nonunion import share due to economic integration will lead to lower protection against nonmember countries.

4. Tariff Creation

Proponents of economic integration tend to emphasize the dynamic advantages over the static benefits.[16] The removal of trade barriers leads to more specialization in areas of comparative advantage. After import prices fall as a result of the elimination of intra-bloc barriers, domestic industries are forced

[13] Krueger (1995) mentions the possibility that newly grown intra firms put protectionist efforts against third countries in order to keep now established intra-market shares.
[14] See Magee, Brock, and Young (1989), Ch. 11 for a detailed discussion.
[15] Neven and Roeller (1991) have a similar position: "A high common external tariff seems to be associated with a higher import share from the rest of the world and a lower import share of EC origin. This finding is possibly explained by the 'political economy' of protectionism, such that industries that are not competitive seek protectionism more than others"(p. 1304).
[16] The Commission of the EC (1988) emphasizes the dynamic aspect of EC 1992. For example, see Chapter 5 in volume 2, Basic Findings by Smith and Venables and Chapter 8 in same volume by Cawley and Davenport.

to exit and resources focus on the areas in which they are competitive.[17] There is a reduction in the domestic production of import-substituting goods and greater specialization in export commodities. Overall, comparative advantage strengthens. The removal of trade barriers should increase the intensity of competition, leading to an increase in the share of the market by competitive producers.[18]

From a customs union perspective, concentration increases after integration[19] and the larger market allows for greater economies of scale.[20] Peck (1989) argues that a major source of the 1992 EC economic gains is a reorganization of European industry to take advantage of economies of scale, thereby allowing the number of plants and firms in the Community be reduced.

Table 2

Simulation Result for the Number of Firms after Market Integration

industry	ce-ment	phar-maceu-tical	artificial, synthetic fiber	machine tool	office mach-ines	elec-tric motors	electrical appliance	motor vehi-cles	carpet	foot wear
before	119	390	43	646	66	471	141	14	287	737
after	120	343	42	628	66	439	82	6	178	530
change	+1	-47	-1	-18	0	-32	-59	-8	-109	-207

Source : Smith and Venables (1988): Table 1 and 5, arranged.

Note. - The assumptions for this simulation are that there is no price differentiation and there is a reduction in trade barriers.

Smith and Venables (1988) estimates from simulation results that for ten industries, the number of firms in the EC should decline in all but cement and office machinery out of ten industries (Table 2). Increased industry concentration after economic integration reduces protectionist lobby free riding and thereby

[17] High concentration and larger market share per firm after integration may be argued as a good sign because competitive firms have increased their market shares at the expense of the less efficient firms even though the costs of heavy firms such as numerous X-inefficiencies are forthcoming. This consideration leads to research of the relationship between concentration and price-cost margin after economic integration. See Yamawaki et al. (1989) and Sleuwaegen and Yamawaki (1988) for this study.

[18] See Neven (1990) for these dynamic aspects.

[19] EC-wide Herfindahl index increases from 1/3 to 1/2.

[20] Smith and Venables (1988) share the same opinion: “With EC market integration, shares in ‘national’ markets are no longer of economic significance,....” (p. 304).

increases common external protection (or stronger resistance to reductions in protection), i.e., tariff creation.

5. The Endogenous Tariff and Endogenous Free Riding

We assume the endogenous tariff is determined by the size of free riding in the producer group relative to the consumer group and the relative size of production and consumption proxied by the stakes of the producer and consumer group, respectively. Denote *n*, *m*: number of producers and consumers, respectively; *S,C*: shipments, consumption; *H*: industry Herfindahl index (= 1/*n*); *a,b*,(*A*,*B*) : producer group's free riding coefficient, perceived effectiveness coefficient, (consumer group's free riding coefficient, perceived effectiveness coefficient); α,β, α': size parameters; $a + b \leq 1$, $a \geq 0$, $b \geq 0$[21].
The parameter a is the probability of free riding in the lobby mixed strategy equilibrium.

The tariff equation is as follows:

$$t = a\left[\frac{(\frac{a}{n}+b)}{(\frac{A}{m}+B)}\frac{S}{C}\right]^b = a\left[\frac{aH+b}{B}\frac{S}{C}\right]^b = a\left[(aH+b)\frac{S}{C}\right]^b * B^{-b} = a'\left[(aH+b)\frac{S}{C}\right]^b \quad (1)$$

Without loss of generality, the number of consumers, *m*, is assumed to be big enough to make the term *A*/*m* vanish. From this discussion of the tariff equation with the free riding and perceived effectiveness coefficients, we derive a theoretical specification, which links industry concentration to the tariff level as follows:

$$t = a'*\left[(aH+b)*\frac{S}{C}\right]^b \quad (2)$$

where the symbols remain the same. For empirical tractability, let α' in (2) be equal to one. we also add some variables for the political economy such as compensation effect variables. Therefore, the basic tariff equation to be estimated is as follows:

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[21] See Magee, Brock, and Young (1989) for the reason for these restrictions.
[22] Pincus (1975) says " the ratio of imports plus domestic production to production is proxy for the loss to gain" (footnote 10).

$$Tariff = [(aH + b)(S / C)]^{b} + eP, \quad (3)$$

where P denotes other control variables.

Lee and Magee(1996), following Brock and Magee(1977) and Magee, Brock and Young(1989, Appendix to chp 6) and Gawande(1994), show how the degree of free riding within industry lobbies can be estimated from industry data. They interpret a interpret a as the degree of free riding and assume that $a + b = 1$. As the Herfindahl approaches zero with large numbers of firms, the effect of the economic stake S and campaign contributions on the election will also approach zero because of free riding. If $a = 0$ and $b = 1$, then there will be no free riding and the tariff will be proportional to the economic stake of the industry, S.

We proceed with the restriction of $a + b = 1$. Therefore,

$$\begin{aligned} Tariff &= [(aH + b)(S / C)]^{b} + eP \\ &= [(aH + 1 - a)(S / C)]^{b} + eP \\ &= [(a(H - 1) + 1)(S / C)]^{b} + eP \end{aligned} \quad (4)$$

$$\frac{dTariff}{dt} = b\left(a\frac{d\{(H-1)(S/C)\}}{dt} + \frac{d(S/C)}{dt} \right)^{b-1} + e\frac{dP}{dt}. \quad (5)$$

Here, suppose linearity, then

$$\frac{dTariff}{dt} = b\left(a\frac{d\{(H-1)(S/C)\}}{dt} + \frac{d(S/C)}{dt} \right) + e\frac{dP}{dt}. \quad (6)$$

6. Endogenous Tariff Creation and Tariff Diversion in a Customs Union

The interest group model has been applied both to the United States (e.g., Snyder (1993))and to Europe (e.g., Fiorentini(1993) and Weiss(1987)).[23] Weiss (1987) argues that the interest groups in Europe are well organized, and the political economy explanatory variables can be used with confidence in regression analysis to show the direction of influence of the interest group in trade protection.

Andersen and Eliassen (1991) document increasing lobbying in Europe. The number of lobbyists increased ten times from the early 1970s to the end of 1980s, and has increased four times since 1985. After the European Customs Union proposal in 1957, pressure groups moved beyond national boundary for various EC policies. Vaubel (1994) also notes the active role of EC-wide interest groups in policies. He notes that along with EC formation, local interest groups may become weaker, but groups with EC-wide interests can increase their influence because of advantages such as lobbying cost savings; they can lobby one instead of several governments.

We apply equation (2) to economic integration. Now let $\alpha' = \beta = 1$ for simplicity, then

$$t = (a\mathrm{H}+b)\ (\mathrm{S}/\mathrm{C}) \qquad (7)$$

Suppose that there are two countries, A and B, which form a customs union. From equation (7), country A's tariff is constructed as follows:

$$t_A = (\frac{a_A}{n_A} + b_A)\frac{S_A}{C_A} \qquad (8)$$

Similarly, country B's tariff becomes

$$t_B = (\frac{a_B}{n_B} + b_B)\frac{S_B}{C_B} \qquad (9)$$

First, assume that the two countries are identical in the sense that the numbers of producers and consumers are the same and the sizes of production and consumption are the same in both countries. Also

[23] See Kirchner and Schwaiger (1981) for a detailed study of interest groups in the EC. See Magee(1996) for applications to a number of countries, incldluing the United States.

assume that the free riding and perceived effectiveness coefficients are the same: $n_{A=}\, n_B$, $S_{A=}\, S_B$, $C_{A=}\, C_B$, $a_{A=}\, a_B$, $b_{A=}\, b_B$. It follows that $t_A = t_B$. The post-customs union common external tariff will be

$$t_{CU} = \left(\frac{a_{CU}}{n_{CU}} + b_{CU}\right)\frac{S_{CU}}{C_{CU}}, \qquad (10)$$

which might vary according to the number of producers, n_{CU}, as well as S_{CU} and C_{CU}. Even though a certain level of tariffs appears in the end, we can break the resulting tariff into two effects.

From a short-term perspective, every producer is assumed to remain after the implementation of a customs union and maintain their production and consumption is assumed to remain unchanged for simplicity. In equation (10), $n_{CU}=n_A + n_B$, and

$\frac{S_{CU}}{C_{CU}} = \frac{S_A + S_B}{C_A + C_B} = \frac{S_A}{C_A} \left(= \frac{S_B}{C_B}\right)$. Let $\frac{S_{CU}}{C_{CU}} = \frac{S_A}{C_A} = \frac{S_B}{C_B} = 1$. Then

$$t_{CU,\ \text{SHORT-TERM}} = \left(\frac{a_{CU}}{n_A + n_B} + b_{CU}\right)1 \ . \qquad (11)$$

For tractability, we use $a + b = 1$. In this case, the post-customs union tariff should decrease because free riding opportunities will be stronger with more members because of tariff diversion. Figure 1 illustrates the tariff diversion and tariff diversion effects applied to the six EEC countries in 1963[24] . The initial tariff diversion phase is from the country Herfindahl $H_{C,63}$ to the European Herfindahl $H_{E,63}$.

The important point is that if there were no free riding, a would equal 0 in equation (11) and hence industry concentration would be irrelevant to the tariff level. If a = 1, free riding is complete and the tariff is also proportional to the inverse of the number of firms. Estimates by Lee and Magee(1996)

[24] The tariff reductions started in 1959 and ended in 1968. The first EEC census was published in 1963. See footnote 1.

indicate from US data that free riding over protectionist lobbying is pervasive, with estimates of the free-ride parameter of .8.

After the short term tariff, we have

$$t_{CU,\ LONG\text{-}TERM} = \left(\frac{a_{CU}}{n_{CU}} + b_{CU}\right)\mathrm{I} \quad . \qquad (12)$$

The tariff creation phase is the longer period over which the Herfindahls evolve from their value initially, $H_{E,63,}$ to $H_{E,83}$, the Herfindahl index in 1983 for the European union. In Figure 1, integrated and adjusted EEC industries can have higher long-term tariffs, $t_{CU,LONG\text{-}TERM}$, bigger than the short-term tariffs, $t_{CU,SHORT\text{-}TERM}$, if this was a period of consolidation and mergers. Comparing (11) and (12), if n_{CU} in (12) is smaller than $n_A + n_B$, then the long-term tariff rises and tariff creation occurs. If rapid growth of the EEC brings sufficient small firm growth, then the Herfindahl can decrease and tariff diversion results.

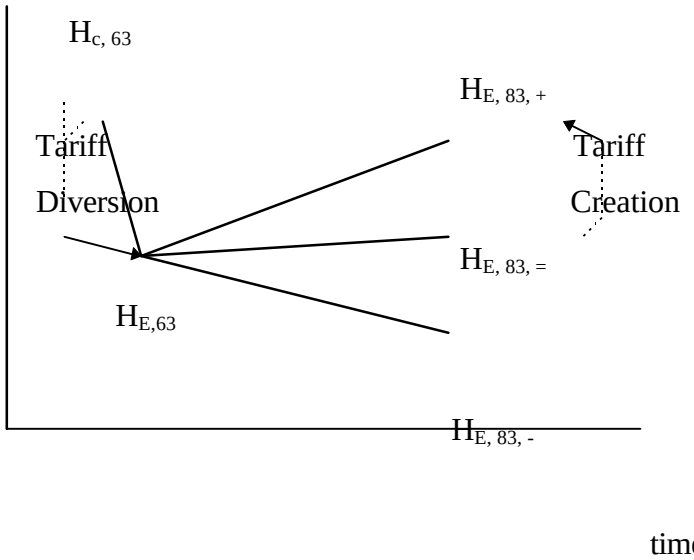

Figure 1.— Dynamics of Industry Concentration and Tariff

The common external tariff will also be affected by other variables in both pre-union countries A and B, such as shipments and consumption. If the ratio of import-competing shipments to consumption rises in a country, the stake is higher for protectionists relative to consumer groups and the endogenous common external tariff rises.

7. The Data

Recall that we use the model above to measure changes in the common external tariff of the EEC after 1968. We measure the tariff-creating and tariff-diverting changes in the common external tariff between 1968 and 1983. We proxy pre- and post-EEC industry conditions using industry data from two of the three largest countries in the EEC (France and Italy).

Yamawaki et al. (1989) studied the effect of the EC formation on EC-wide concentration and subsequently, on the effect of EC-wide concentration on the price-cost margin for EC industries. Following Yamawaki et al. we also choose 1963 as the year to represent the pre-integration year for the original member countries because it is the first year to publish comparable industry data such as the number of firms and employees from which the Herfindahl index can be calculated. In addition, as Sleuwaegen and Yamawaki (1988) note, since the tariff reduction process in the EC started in 1959 and did not end until 1968, 1963 adequately represents pre-integration characteristics.

For the post-integration era, the appropriate year should be picked immediately after the adjustment period to the EC formation because that year might minimize the effect of the addition of new members to the EC and changes in the world trade environment. France, Italy, West Germany, Belgium, the Netherlands, and Luxembourg were the original six members which formed the EC in 1957. In 1973, Ireland, Denmark, and United Kingdom joined the EC and in 1981 Greece was admitted to the EC. The year 1978 is chosen mainly because the data is available for 1978 and beyond.[25] The change in

[25] Emerson et al. (1988) mention 10 years for industry adjustment (p.201).

membership, however, complicates matters because the three new members might derogate the purity of the data. As with Yamawaki et al. (1989), this problem is minimized by excluding the new members in calculating the degree of industry concentration. Further, some data are obtained for years other than 1978 in case the data are not available for 1978 or the quality is low with so many missing values for 1978. For these reasons, post-integration data was chosen from the years 1978 to 1982.

Tariffs. It would be desirable to estimate the level of protection through import duties, but it is impossible to find data regarding EC import duties. We have to construct data on pre-integration tariffs from the 1968 EC autonomous tariff rates, "Base" rates from now on, from the Official Journal of the European Communities. Those tariff rates are assumed to represent the pre-integration status of the tariff structure of member states because the post-integration tariff levels such as 1968 are equal to the simple arithmetic average of pre-integration tariff levels.[26] The 1983 EC concession rates to the GATT members or the "conventional rates," Most Favored Nation (MFN) rates from now on, as post-integration tariff rates are from the Official Journal of 1983. The raw tariff rates data in the Official Journal by Brussels Tariff Nomenclature (BTN) has been converted to the three-digit level of EC Industrial Classification, "la Nomenclature generale des activites economiques dans les Communautes Europeennes (N.A.C.E.)," which is the classification used for the present research. For the method used to construct the concordance table used in this study, see Lee(1996). The tariff variables used in the empirical study are as follows:

$$\text{Base1968} = \frac{\sum_{i=1}^{I} t_i, 1968, Base}{n_I}, \quad \text{MFN1983} = \frac{\sum_{i=1}^{I} t_i, 1983, MFN}{n_I}$$

where t_i denotes the tariff rate by four-digit BTN and n_I denotes the number of BTN in an N.A.C.E.

The absolute tariff rates may not accurately reflect the size of the change in the protection level due to the fact that the N.A.C.E. tariff rates are the average of the composed tariff rates of the BTN. For example, suppose that there are two tariff items in the BTN also belonging to the same N.A.C.E. The

[26] Article 19 of the Treaty of Rome in 1957, reprinted in EC (1967), stipulates : "1. ..., duties in the common customs tariff shall be at the level of the arithmetical average of the duties applied in the four customs territories comprised in the Community."

tariff rate of the first item changed from 100% to 50% and that of second item changed from 2% to 1%. It is clear from this example, that the more approximate status of the tariff change would be 50% down, the mean of each tariff reduction, 50% and 50%, rather than 25.5% down, subtracting the post-CU simple mean of 25.5% from the pre-CU simple mean of 51%. Therefore, the change in tariffs was constructed based on the following formula:

$$\text{MFN1983/Base1968} = \frac{\sum \frac{t_i, 1983, MFN}{t_i, 1968, Base}}{n_I}.$$

Data shows that MFN tariff rates on average has maintained a 48% level of 1968 base tariff rates (a 52% reduction).

Trade creation and trade diversion. Kreinin (1981) estimates the TC and TD effects of enlarging the EC from six to nine members and launching free trade between the EC and the rest of the European Free Trade Association (EFTA). The enlargement is therefore viewed as a fusion of the two blocs into one. He calculates TC and TD as follows[27]:

TC: increase in total imports (= external imports + internal imports),

TD: decrease in external imports .

Alternatively, he offers an approach based on the growth rates between the pre-integration base year and the post-integration years:

TC: growth rate in the ratio of "total imports/consumption,"

TD: growth rate in the ratio of "external imports / consumption."

As Neven and Roeller (1991) indicate, the question is whether the observed decreases in non-EC imports are due to a change in the fundamental factors underlying trade patterns or whether it is induced by the formation of the EC. We assume that changes in TC and TD arise purely from the integration factor. The trade diversion does not arise from the EC integration, as proponents of integrated Europe have argued.

[27] Kamera and Ku (1994) use different methods for TC and TD, modifying Baldwin and Murray (1977). They calculate TC and TD as TCi = Mi*ni*(Δti/1+ti) and TDi = TCi*(MNi/Vi), where TCi (TDi) is TC (TD) effect for good i in a country, Mi is initial level of imports from the beneficiary country, ti is an initial level of tariffs for good i from the beneficiary country, Δti is tariff cuts in good i and MNi is imports of good i from nonbeneficiary countries, Vi is total domestic production of commodity i in a country, and ni is price elasticity of import demand for good i. We do not adopt this method because of the limitation of elasticity data.

The indicator of trade diversion - measured by the share of “External imports” in total “Consumption” - increased from 8.7% in 1963 to 10% in 1979.

Table 3

Mean of ‘External Imports / Consumption’

1963	1979	Difference
0.08685	0.10145	+ 0.01459

Trade creation, equal to “Total imports/Consumption” increases from 21.6 % in 1963 to 23.4 % in 1979.

Besides the Kreinin method, we can measure TD and TC in a different way. We measure TD as the change in external imports during the period divided by external imports in 1963 and TC as the change in internal imports during the period divided by internal imports in 1963. The potential problem with this method is that both external and internal imports should increase due to the increase of the economy and trade size. For this reason, we should pay attention to the relative size of TC and TD in different industries rather than individual numbers.

Concentration. In their study of the effects of the EC’s formation on market structure and competitive performance in member countries, Yamawaki et al. (1989) estimate EC-wide concentration by taking the average of the maximum of the four largest firms’ share in total employment and the minimum of it. First, they find that European economic integration removing intra-trade barriers has led to a more concentrated industry structure. Second, they show that the EC-wide concentration is a significant variable in explaining the price-cost margin in national markets of member countries. In their estimation of EC-wide concentration, they subtract the employment of Great Britain, Ireland, and Denmark from the total EC employment in 1978 to eliminate possible distortions related to the 1973 accession of these three countries.

We estimate concentration using the Herfindahl index because the tariff equation is better represented by this index than other indices such as the four-firm concentration ratio. Sales data is desirable but only data about the number of firms and employees of the member countries are available.

The classified categories of the raw data are different between the pre-integration period and post-integration period. This problem is handled by combining classified categories. A more serious problem is that the firms and employees data for member countries other than France and Italy have quite a few missing values in many industries, which derogate the quality of the data. To solve this problem, we only use French and Italian data, the most accurate information, to construct the Herfindahl index, which is believed to be consistent. We were only able to make a very preliminary cut at the data. We calculated the Herfindahl index using only the 100 largest firms in France and Italy. See Lee(1996, Appendix K) for a detailed method for calculating the Herfindahl index.

The degree of concentration after EC integration measured by the Herfindahl index increased very modestly from 137.5 to 140.8.[28] Out of 51 industries in the study, the number of industries with an increased Herfindahl index is 31, while 20 industries show the decreased concentration ratio. The Herfindahl indices for individual industries are presented in Lee(1996).

8. The Estimation Results

Marvel and Ray (1983) studied US tariff cuts in the Kennedy Round and found that tariff cuts were more severe in less concentrated industries. Cheh (1974) studied the exemptions from the across-the-board 50 % tariff cut imposed in the Kennedy Round awarded to US industries. He showed that reductions in tariff and non-tariff trade barriers may be explained by variables such as labor adjustment costs. In particular, declining industries with a high proportion of unskilled workers are associated with low reductions. Riedel (1977) applied the methodology of Cheh to West Germany between 1964 and 1972.

Table 4

Mean of the EC Herfindahl Index

1968	1983	Difference

[28] For reference, the average Herfindahl index of 50 firms for mid 1980 U.S.A. is about 600, which shows U.S.A. industries to be more concentrated than European ones.

137.5	140.8	+ 3.3

Note.- Unweighted means for 51 three-digit manufacturing industries

Table 5

Number of Industries by Change in Concentration

Increase (+)	Decrease (-)	Total
31	20	51

Table 6

Effect of Trade Diversion on Protection
Dependent Variable: MFN 1983 / Base 1968

Independent variable	regression 1	regression 2	regression 3	regression 4
Constant	0.4833 ***	0.4834 ***	0.4899 ***	0.4497 ***
	(25.212)	(26.505)	(21.454)	(16.174)
TD: Δ External import penetration	0.0231	-0.0662		
	(0.130)	(-0.382)		
TD: External import penetration ratio			-0.0044	-0.0063
			(-0.501)	(-0.752)
HDif:ΔHerfindahl EC index = $H_{E,83}$-$H_{E,63}$		3.4783 **		
		(2.475)		
Concentration ratio = $H_{E,83}/H_{E,63}$				0.0285 **
				(2.345)
Adj R-sq	-0.020	0.07	-0.01	0.07
F value	0.017	3.072	0.251	2.888
Sample Size	51	51	51	51

Note. - The numbers of observations may differ due to exclusion of outliers. t-values appear in parentheses below coefficients.
** : significant at the 5 percent level. *** : significant at the 1 percent level.

The analysis in this paper is of industry tariffs. However, we know that overall tariff declines could have been expected in Europe from the 1960s to the 1980s for two reasons. First, the average effective country size increased, meaning that greater natural geographic protection could have replaced policy protection. Second, there were GATT rounds during this period. The GATT effect can be seen in the US tariff reductions. The average US tariff rates in 1967 and 1968 are 7.5 and 7.1%, respectively, and in the later years of 1982 and 1983 they are 3.6 and 3.7%, respectively.[29] From this, we know that tariff reductions were 50% or so internationally[30]. The estimated constants in our regressions are around 0.4 to 0.5, which means 40% to 50% overall tariff reductions occurred in the EC.

Consider now the effects of trade creation (TC) and trade diversion (TD) on the common external EEC tariffs over this period. Kreinin estimated TD by the growth rate in the ratio of "external imports/consumption." We construct two variables, the *External import penetration ratio* between 1963 and 1979 (= IMETCON79: Imports from non-EC, 1979/ Consumption, 1979) / (IMETCON63: Imports from non-EC, 1963/ Consumption, 1963) and the difference of the two import penetrations, D*External import penetration* [= IMETCON79-IMETCON63]. We expect a weak positive sign for the TD effect. The t-values in regressions 1 to 4 are very low and show different signs except in regression 1. Recall that the dependent variable is the ratio of the 1983 tariff divided by the 1968 tariff.

In Table 7 we use different measures for TD and TC. TD here is the change in external imports during the period divided by external imports in 1963, ΔIMET/IMET63, but is insignificant. But TC as the change in internal imports during the period divided by internal imports for 1963, ΔIMIN/IMIN63, shows significance at the 5 percent level. Following the result of regression 6 that TC results in a higher external tariff or less reduction, the compensation effect hypothesis seems to be supported compared to the accelerated declining support hypothesis.

[29] Magee, Brock and Young(12989, Appendix to chp 13).

[30] Lasok and Cairns (1983) mention the several Rounds of the GATT tariff reduction: In the 1962 Dillon Round, a 20% tariff reduction was decided. The Kennedy Round starting in 1962 reached average tariff reductions of 35% and the Tokyo Round from 1973 resulted in an average tariff reduction of 30% on industrial products (pp.144-146). If tariffs were reduced according to these Rounds, the final tariff level would be 36.4 % [= ((100*0.8)*0.65)*0.7].

Table 7

Effect of Trade Diversion and Trade Creation on Protection
Dependent Variable : MFN 1983 / Base 1968

Independent variable	regression 5	regression 6
Constant	0.4924 ***	0.4226 ***
	(20.277)	(13.03)
TD: Δ External imports/ External imports$_{63}$ = ΔIMET/IMET63	-0.0009	
	(-0.58)	
TC: ΔInternal imports/ Internal imports$_{63}$ = ΔIMIN/ IMIN63		0.0038 **
		(2.268)
Adj R-sq	-0.01	0.07
F value	0.336	5.144
Sample Size	51	51

Note. - The numbers of observations may differ due to exclusion of outliers.
t-values appear in parentheses below the coefficients.
: significant at the 5 percent level. *: significant at the 1 percent level.

In Table 8, the signs of coefficients for the free-riding coefficient, *a*, and group stake, *b*, are positive as expected, significant and both considerably greater than 1. These are the coefficients appearing in equation (6), with the addition of other variables.

Table 8
Free Riding and Protection: Dependent Variable : MFN Tariffs 1983 / Base 1968

Variables	regression 7	regression 8	regression 9
Constant	0.41 ***	0.387 ***	0.605 ***
	(12.39)	(12.0)	(17.53)
Individual stake: $(H_{83}\text{-}1)(S/C)_{83}\text{-}(H_{63}\text{-}1)(S/C)_{63}$	3.53 ***	7.14 ***	2.96 ***
	(2.814)	(3.571)	(2.661)
Group stake: $(S/C)_{83}\text{-}(S/C)_{63}$	3.44 ***	6.99 ***	3.0 ***
	(2.78)	(3.551)	(2.70)
Internal imports ratio: Internal imports 83/ Internal imports 63	0.004 ***	0.005 ***	0.005 ***
	(2.69)	(3.3)	(3.464)
Compensation effect: $Shipment_{83}/Shipment_{63}$			-0.01 **
			(-2.39)
ΔExport intensity: $(Export/Shipment)_{83}\text{-}(Ex/S)_{63}$			-0.47 *
			(-1.84)
Adjusted R-square	0.18	0.26	0.24
F value	4.728	6.614	4.207
Sample Size	51	49	51

Note. - The numbers of observations may differ due to exclusion of outliers. t-values appear in parentheses below coefficients.
*: significant at the 10 percent level. **: significant at the 5 percent level.
***: significant at the 1 percent level.

The sign of the *Internal imports ratio* (= Internal imports,1983 / Internal imports,1963), needs some explanation. The imports among member countries should be the same *ex post* as the exports among member countries. Therefore *Internal imports ratio* is thought to be equal to the internal export ratio. We may interpret this as meaning that more intra-customs union exports results in a higher external tariff because the higher ratio of intra-EC exports tends to alleviate risk exposure to a foreign country's retaliatory tariff once the EC sets the higher Another regression result, with the addition of the ratio of two period shipments, S_{83}/S_{63}, and the difference of export intensity between the comparison times, $(EX/S)_{83}\text{-}(EX/S)_{63}$, is also presented. Greater shipments after integration mitigates the sentiment toward protection. Therefore, the sign of S_{83}/S_{63} is negative as expected. The *Export intensity* variable (EX/S) denotes the ratio of extra-regional exports to shipments. A higher ratio means more risk related to the

EC's import protection policy because the region's exports will be the target of retaliation. The sign of D*Export intensity* is negative as expected.

There is a possibility here of simultaneous equation bias. The change in external tariffs, MFN1983/Base1968, can affect the right-hand side variables. For example, the higher the change in tariffs, the lower the expected external import penetration. This simultaneity could explain the trade diversion and trade creation results. We address this problem in the Appendix to the paper.

Table 9 tests concentration effects on protection directly. The t-value for the coefficient of the change in the Herfindahl index, *HDif*, or the ratio of two Herfindahl indices, H_{83}/H_{63}, is significant at the 95% confidence level in the table. Both of these measures are for the EC as a whole, before and after.

Table 9

Effect of Concentration on Protection
Dependent Variable : MFN 1983 / Base 1968

Independent variable	regression 10	regression 11	regression 12	regression 13	regression 14
Constant	0.4825 ***	0.4141 ***	0.4769 ***	0.4380 ***	0.44183 ***
	(26.922)	(6.524)	(26.195)	(6.728)	(17.225)
HDif:ΔHerfindahl EC index = $H_{E,83}$-$H_{E,63}$	3.3668 **	3.0543 **	6.6412 **	5.7275 **	
	(2.471)	(2.202)	(2.811)	(2.207)	
Concentration ratio =$H_{E,83}/H_{E,63}$					0.0276 **
					(2.293)
Tariff 68		0.0045		0.0027	
		(1.123)		(0.624)	
Adj R-sq	0.0926	0.00975	0.1257	0.1142	0.0784
F value	6.105	3.7	7.903	4.095	5.256
Sample Size	51	51	49	49	51

Note. - The numbers of observations may differ due to exclusion of outliers. t-values appear in parentheses below coefficients.
** : significant at the 5 percent level. *** : significant at the 1 percent level.

Tariff Diversion

Table 10 contains all of the components of tariff diversion and tariff creation. The first component of tariff diversion is the immediate, short-term decline in industry concentration caused by the formation of the customs union. The variable representing this instantaneous change in industry concentration after integration, *HDivert*, is constructed by subtracting the simple average of Herfindahl indices of member countries before the merge, $H_{C,63}$, from the Herfindahl EC index 1963 of the now integrated economy, $H_{E,63}$. Concentration from the national view is supposed to decrease. The positive sign indicates that the higher the EC Herfindahl relative to the original country Herfindahls, the higher the EC common external tariffs in 1983 relative to the initial EC common external tariff. Only in regression 17 is *HDivert* nearly significant, at the .106 level.

The second tariff diversion variable is the *Shipments ratio* (= Shipments, 1983/Shipments, 1963), which reduces tariffs through the compensation effect. The EC experienced a dramatic expansion with formation of the union. Regression 16 indicates that industries with rapid shipment increases had a lower ratio of tariffs in 1983 relative to those in 1968. The Appendix reports Hausman tests and instrumental estimates to correct for simultaneous equation bias. Correction for simultaneity eliminated this tariff diversion effect due to the growth of shipments. The growth of shipments appears to have been affected by the tariffs changes, but only at the .0983 level of significance. Thus, simultaneity for this one variable exists at the .10 level but not at the .05 level. In all other cases, the Hausman test could not reject the null hypothesis that the independent variables were predetermined.

Tariff Creation

Table 10 also reports the contributors to tariff creation. The first is the long-term increase in industry concentration because of mergers, which should increase tariffs. This change in industry concentration from 1963 to 1983, *HDif*, is constructed by subtracting the Herfindahl EC index 1963, $H_{E,63}$, from the Herfindahl EC index 1983, $H_{E,83}$. The Herfindahl EC index 1963 is constructed as if the EC were a customs union in 1963 and the Herfindahl EC index 1983 is constructed by EC-wide

concentration. Thus, the difference between the two Herfindahl EC indices is supposed to capture the intertemporal change in industry concentration, which might create a tariff. As with previous regressions, the more concentrated industries from 1963 to 1983 have the higher level of later tariffs. Thus, we also expect *HDif* to have a positive sign. That is, we expect tariff creation. In fact, Hdif is very significant.

The second tariff-creating variable is the growth of internal imports after customs union formation. We measure this by the ratio of internal EC imports in 1983 divided by internal EC imports in 1963. Notice that the more rapid this growth, the higher the 1983 tariff. This variable is also significant.

Table 10

Regression Results of Tariff Diversion and Tariff Creation
Dependent Variable : MFN 1983 / Base 1968

Independent variable	regression 15	regression 16	regression 17	regression 18	regression 19
Constant	0.4446 *** (7.004)	0.4287 *** (13.077)	0.4112 *** (12.036)	0.4036 *** (11.122)	0.5256 *** (6.675)
Tariff 68	0.0015 (0.373)				
Tariff Diversion :Hdivert $=H_{E,63}-H_{C,63}$	0.4577 (0.331)	1.6012 ^ (1.278)	3.4104 ### (1.657)	3.5943 ## (1.622)	3.4882 # (1.611)
Tariff Diverting: Shipments Ratio = Shipments 83 / Shipments 63		-0.0081 *** (-2.158)			
Tariff Diverting: Initial internal imports share = Internal Imports 63/ Total Imports 63					-0.1713 * (-1.736)
Tariff Creation: Hdif: ΔHerfindahl EC index = $H_{E,83}-H_{E,63}$	6.8915 *** (2.949)	6.6976 *** (2.764)	7.6420 *** (3.011)	8.0836 *** (2.912)	6.7472 *** (2.412)
Tariff Creating: Internal imports ratio = Internal imports 83/ Internal imports 63		0.0063 *** (4.246)	0.0049 *** (3.303)	0.0057 *** (3.543)	0.0042 *** (2.355)
ΔExport intensity: (Exports/Shipments)83 - (Exports/Shipments)63		-0.3759 *** (-2.801)	-0.1952 * (-1.706)	-0.2326 * (-1.874)	-0.2416 * (-1.911)

Adjusted R-square	0.163	0.312	0.259	0.259	0.293
F value	4.057	5.278	4.849	5.038	4.827
Sample Size	48	48	45	47	47

Note. - The numbers of observations may differ due to exclusion of outliers. t-values appear in parentheses below coefficients.

^: significant at the 20.8 percent level. # : significant at the 11.5 percent level.
##: significant at the 11.2 percent level. ###: significant at the 10.6 percent level.
* : significant at the 10 percent level. ** : significant at the 5 percent level.
*** : significant at the 1 percent level.

9. A Summary of the Results

A summary of the overall change by cause in EEC external tariffs from 1968 to 1983 is presented in Table 11. When we apply these calculations to the means of the variables in Table 13 of the Appendix, we get the following. The common external tariff of the EEC on manufactures in our sample dropped from 15 percent in 1968 to 7.5 percent in 1983. We speculate that much of this decline is explained by GATT tariff negotiations, since US tariffs also dropped in half over this time period

Over the period from 1968 to 1983, tariff diversion caused the common external tariff of the EEC to fall by 15 percent and tariff creation caused the common external tariff of the EC to rise by 22 percent. Applying these numbers to the average 1983 tariff means that *tariff diversion* subtracted 1.1 percentage points (from 7.5 to 6.4 percent) while *tariff creation* added 1.7 percentage points (from 7.5 to 9.2 percent). Another control variable predicts a remaining negative change of approximately .6 percent.

Thus, the data indicates that the tariff creating and tariff diverting effects are (1) small and (2) largely offsetting. These results do not support fears that regional integration is inevitably accompanied by increased protection against outside countries.

Tariff diversion was caused by two factors in the EEC. One was the decline in industry concentration due to the economic integration and the other was less protectionist pressure due to general EEC prosperity spilling over to import-competing firms.

Tariff creation was caused by two other factors which would increase protectionist pressure in the EEC. One was a small increase in industry concentration from 1963 to 1983 due mergers, etc. and the other was the rapid growth of internal imports. The year 1963 rather than 1968 had to be used as the initial year for the industry data.

The coefficients used for these calculations in Table 11 are from regression 16 in Table 10. Hausman simultaneity tests, reported in Table 15 of the Appendix, indicate that none of the four tariff creation and tariff diversion explanatory variables were plagued by simultaneous equation bias at the 5 percent level and only one was significant at the 10 percent level. Recall too that the results in this paper are limited by our having industry data from only two of the three largest countries in the EEC, France and Italy.

Summary Table 11

The Change in EEC Tariffs, 1968-1983,
Caused by Tariff Diversion and Tariff Creation

Tariff Diversion	Tariff Creation
1. External tariffs fall because the EC Herfindahls are much smaller than the pre-EC country Herfindahls. Coefficient : 1.6012 HDivert = $H_{E,63}$-$H_{C,63}$ = -0.0115 Effect = -0.0185	1. External tariffs rise because firm mergers and economies of scale cause Herfindahls to rise following creation of the EC. Coefficient : 6.6976 HDif = $H_{E,83}$-$H_{E,63}$ = 0.000329 Effect = 0.0022
2. External tariffs fall the more rapid the growth of the domestic market. Coefficient: -0.0081 Shipments83/Shipments63 = 6.9372 Effect = -0.0562	2. External tariffs rise the more rapid the growth in intra-EC trade. Coefficient: 0.0063 Internal imports 83/Intern imports 63 = 16.95 Effect = 0.1068
Total Tariff Diversion : -0.0747 Total Tariff Ratio : 0.484 Percentage Effect : -15%	Total Tariff Creation : 0.1090 Total Tariff Ratio : 0.484 Percentage Effect : 22.5%

The dependent variable is the ratio of tariffs in 1983 to tariffs in 1968. The mean of this variable was .484 in 1983, from which the percentage changes were calculated.

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Appendix

The beta coefficients for selected equations are estimated in the standardized regressions. In Table 12, a change of one standard deviation in the variable *HDivert*, is expected to change the dependent variable, *MFN1983/Base1968*, by 0.1619 times the standard deviation of the dependent variable. Using the real value reported in Table 13, a change of 0.0134 in *HDivert* is expected to change *MFN1983/Base1968* by 0.0217 (= 0.1619* 0.1343). A change of 0.0133 in the variable *HDif* is expected to change the dependent variable, *MFN1983/Base1968*, by 0.0505 (= 0.3766 * 0.1343). Similarly, in regression 18, the sizes of change in the dependent variable due to a change of one standard deviation in the variables *HDivert* and *HDif* are 0.0289 (= 0.2154 * 0.1343) and 0.0570 (= 0.4249*0.1343), respectively.

Table 12

Beta Coefficients in Selected Regressions

Independent variable	regression 16	regression 18
Constant	0.0	0.0
HDivert	0.1619	0.2154
HDif	0.3766	0.4249
Internal Imports ratio	0.5913	0.4519
Shipments ratio	-0.3659	
ΔExport Intensity	-0.4711	-0.2493

Table 13

Summary Statistics for the Industries in the Regressions

Variable	N	Mean	Standard Dev.
Tariff,1968	51	15.10904	4.563298
MFN,1983	51	7.371824	4.007021
MFN,1983/ Tariff,1968	51	0.4836	0.134321
Herfindahl, France	51	0.024324	0.033628
Herfindahl,Italy	51	0.026264	0.033117
$H_{C,63}$ (= Pre-EC Herfindahl)	51	0.025294	0.031332
Herfindahl, EC, 1963	51	0.013759	0.018974
Herfindahl, EC, 1983	51	0.014087	0.015392
HDif=H,EC,83-H,EC,63	51	0.000329	0.01328
HDivert=H,EC,63-$H_{C,63}$	51	-0.011535	0.013379
Internal Imports 83/ Internal Imports 63	51	16.94468	10.8135
Shipments 83/ Shipments 63	51	6.937188	5.155767
Internal Imports 63/ Total imports 63	51	0.5648	0.1893
(Exports/Shipments) 1983 - (Exports/Shipments) 1963	51	-0.004477	0.143584

We address the simultaneity problem in two ways. We first estimate the tariff with variables predetermined before 1968 (Table 14). The signs are as expected and are not different from previous regressions. However, we still have low t-values for Tariff 68 as before and for $H_{E,63}$. Table 14 provides a list of variables that are candidates for instrumental estimation.

Table 14

Regressions Using Pre-Determined Variables Only
Dependent Variable : MFN 1983 / Base 1968

Independent variable	regression 20	regression 21	regression 22	regression 23
Constant	0.4653 ***	0.4118 ***	0.480 ***	0.5422 ***
	(4.367)	(3.475)	(4.274)	(6.560)
Tariff 68		0.004		0.0057
		(1.208)		(1.477)
$H_{E,63}$			-0.4338	
			(-0.452)	
Shipments- Consumption Ratio:	0.2703 *	0.2511 *	0.2557 *	
Shipments 63 / Consumption 63	(1.980)	(1.824)	(1.835)	
Initial internal imports share:	-0.3545 ***	-0.3443 ***	-0.3537 ***	-0.2564 ***
Internal Imports 63/ Total Imports 63	(-3.345)	(-3.236)	(-3.308)	(-2.753)
Export intensity:	-0.5554 **	-0.4988 **	-0.523 **	
(Exports/Shipments)63	(-2.307)	(-2.021)	(-2.071)	
Adjusted R-square	0.177	0.168	0.163	0.142
F value	4.583	3.204	3.430	5.130
Sample Size	51	51	51	51

Note. - The numbers of observations may differ due to exclusion of outliers. t-values appear in parentheses below coefficients.

* : significant at the 10 percent level. ** : significant at the 5 percent level.
*** : significant at the 1 percent level.

A second approach to apply the Hausman(1978) test to those variables in Table 10 with 1983 subscripts. The results indicated that the Shipments Ratio (=Shipments 83/Shipments63) was not predetermined in the tariff regression. Table 15 reports the original regression 16 in Table 10 and the estimation of regression 16 using instrumental estimates. The results reveal that there was not a tariff diverting shipments effect, but merely simultaneous equation bias.

Table 15

Regression Results of Tariff Diversion and Tariff Creation
Using Two-Stage Least Squares: Dependent Variable : MFN 1983 / Base 1968

Independent variable	regression 16	16	regression 16 A	Hausman test significance
Constant	0.4287 ***		0.3981***	
	(13.077)		(10.043)	
Tariff 68				
Tariff.Diversion :HDivert=$H_{E,63}$-$H_{C,63}$	1.6012 ^		1.9097**	
	(1.278)		(1.431)	
Tariff.Diverting: Shipments.Ratio.= Shipments 83 / Shipments 63	-0.0081 ***		-0.0011	.0983^^
	(-2.158)		(-0.192)	
Tariff Diverting: Initial internal imports share = Internal Imports 63/ Total Imports 63				
Tariff Creation: Hdif: ΔHerfindahl EC index = $H_{E,83}$-$H_{E,63}$	6.6976 ***		7.8405***	
	(2.764)		(2.367)	.7817
Tariff Creating: Internal imports ratio = Internal.imports 83/ Internal imports 63	0.0063 ***		0.0054***	.9854
	(4.246)		(3.207)	
ΔExport.intensity: (Exports/Shipments)83 - (Exports/Shipments)63	-0.3759 ***		-0.2292*	.2101
	(-2.801)		(-1.353)	
Adjusted R-square	0.312		0.237	
F value	5.278		3.924	
Sample Size	47		47	

Note. - The numbers of observations may differ due to exclusion of outliers. t-values appear in parentheses below coefficients.

^: significant at the 20.8 percent level. * : significant at the 18.3 percent level.

: significant at the 16 percent level. * : significant at the 1 percent level.

^^ significant at the 10 percent level

Equation (16 A) is a Two-Stage Least Square estimation of (16) using the predicted value of the shipments ratio. The first-stage estimations were SHCON 63, EXINT63, DHERFT, HDIF, IMINRAT, and EXINTDIJ.

Tariff Creation and Tariff Diversion in a Customs Union:

The Endogenous External Tariff of the EEC, 1968-1983

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University of Texas at Austin and University of Chicago (Spring, 1997)
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Presented at the Conference on Pressure Groups,
Self Regulation and Collective Decision Mechanisms
Milan, Italy January 10, 1997

Jan 20, 1997 Version

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Abstract

Data from the EEC from 1968-1983 do not support the view that regional trading arrangements necessarily lead to increased endogenous protectionism toward outside countries. This paper applies previous theoretical work by both authors on the theory of endogenous protection and endogenous free riding to the European Economic Community (the EEC). We use data from 51 three-digit manufacturing industries to explain endogenous changes in the common external tariff of the EEC over the period 1968-1983. We proxy pre- and post-customs union formation using data from two of the three largest countries in the EEC (France and Italy). In this sample, the common external tariff of the EEC fell from 15 percent to 7.5 percent from 1968-1983, largely due to GATT negotiations. US tariffs also fell in half over this period.

Our industry analysis indicates that the common external tariff rose by 1.7 percentage points from 1968-1983 because of "tariff creation," which was (1) increased political pressure from protectionists most harmed by the rapid growth in intra-EEC imports and (2) decreased free

riding caused by increased industry concentration due to firm mergers stimulated by plant and firm economies of scale.

We found that the common external tariff fell by 1.1 percentage points from 1968-1983 because of “tariff diversion,” caused by (1) increased free riding within protectionist industry lobbies because of their operation within the larger political arena of the EEC and (2) decreased political pressure from those protectionists whose industries had grown rapidly thanks to the movement towards optimal country size and other customs union efficiencies.

Nontechnical Abstract

Data from the EEC from 1968-1983 do not support the view that regional trading arrangements necessarily lead to increased endogenous protectionism toward outside countries. This uses data from from 51 three-digit manufacturing industries from the European Economic Community (the EEC) over the period 1968-1983 to explain changes in the common external tariff of the EEC. The common external tariff of the EEC fell from 15 percent to 7.5 percent from 1968 to 1983, largely due to GATT negotiations. US tariffs also fell in half over this period.

Our industry analysis indicates that the common external tariff rose by 1.7 percentage points from 1968-1983 because of "tariff creation," which was (1) increased political pressure from protectionists most harmed by the rapid growth in intra-EEC imports and (2) decreased free riding caused by larger firm size due to firm economies of scale.

We found that the common external tariff fell by 1.1 percentage points from 1968-1983 because of "tariff diversion," caused by (1) increased free riding within protectionist industry lobbies because of their operation within the larger political arena of the EEC and (2) decreased political pressure from those protectionists whose industries had grown rapidly thanks to the movement towards optimal country size and other customs union efficiencies.