

THE COST OF THE VOLUNTARY EXPORT RESTRAINT
OF JAPANESE AUTOMOBILE EXPORTS TO THE UNITED STATES

BY

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Thesis submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree
of

MASTER OF ARTS

in

Economics

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May, 1987

Blacksburg, Virginia

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(ABSTRACT)

At the request of the United States Government, effective as of April 1, 1981, the Japanese began voluntarily restraining exports of automobiles to the United States to provide the U.S. automobiles industry with a period of time to make the necessary adjustment to become more competitive with imports.

It is the purpose of this paper to examine the impact of the VER, particularly the costs to consumers and the benefits to U.S. producers, quota rents captured by the Japanese producer during 1981-84 will also be examined.

Between 1981 and 1984 the Voluntary Export Restraint Agreement cost the U.S. economy \$8.4 billion. In terms of increases in the cost of purchasing a car, the estimate ranges between \$95 in 1981 to as high as \$241 in 1984. During the four years of the VER, the consumer costs

amounted to \$8.9 billion. Meanwhile, the U.S. producers of automobile benefited only \$403 million as a result of the VER. If this benefit is translated to the number of jobs saved, it amounts to 29,000 jobs. Therefore, the consumer cost of creating each new job was \$334,000.

As for the impact of VER on the Japanese producers, the result shows that the price effects of the VER has increased over the four years as the restrictive effect of the VER has intensified. During 1981, the VER added \$733 to the price of each Japanese automobile, but by 1984, it was adding about \$2,000.

TABLE OF CONTENTS

I.	INTRODUCTION -----	1
II.	MODEL AND ASSUMPTIONS -----	8
	A. Assumptions	
	B. Model	
	C. Estimations of Linear Demand Curve Parameters	
	D. Estimated Japanese Supply Price During VER	
III.	COSTS AND BENEFITS -----	26
	A. Cost to Consumers	
	B. U.S. Producers' Surplus	
	C. Japanese Quota Rents	
	D. Losses to the U.S. Economy	
IV.	CONCLUSION -----	31
	Selected Bibliography -----	35
	Resume -----	36

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I. INTRODUCTION

In the late 1970's, there was an unusual development in the U.S. automobile market. Overall demand for the automobile was decreasing; however, the popularity of the Japanese automobile was increasing rapidly. As can be seen from Tables 1-1 and 1-2, the U.S. consumption of automobiles decreased from 10.5 million units in 1979 to 7.6 million units in 1982. Japanese imports rose 35 percent from 1.5 million units in 1978 to almost 2 million units in 1982. This situation led to a popular conclusion that the root cause of the deterioration within the automobile market was an economic recession. But increased demand for the Japanese cars by American consumers also contributed to the deterioration. Hindsight provides us with a clearer view of reality. During this time American consumers turned away from their gas guzzling cars in favor of smaller fuel-efficient cars. The large automobile had once been synonymous with the American lifestyle. From the late 1970's onward, however, consumer tastes were driven more by economic realities.

In June of 1980, the Ford Motor Co. and the United

Table 1-1

New Passenger Automobiles (U.S. Factory Sales, Imports,
Exports, and Apparent Consumption, 1975 -1984;
in Quantity Units)

Year	U.S. Factory Sales	Imports	Exports	Apparent Consumption
1975	6,712,825	2,074,653	642,028	8,145,477
1976	8,497,603	4,536,749	680,666	10,353,686
1977	9,198,956	2,790,144	697,925	11,291,175
1978	9,165,190	3,024,982	685,194	11,504,978
1979	8,419,226	3,005,523	781,619	10,643,130
1980	6,399,840	3,116,448	612,723	8,903,565
1981	6,255,340	2,856,286	545,164	8,566,462
1982	5,049,184	2,925,407	376,524	7,599,067
1983	6,739,223	3,131,427	550,972	9,322,552
1984	7,621,176	3,559,427	613,051	10,567,552

Source : USITC, The U.S. Automotive Industry, U.S. Factory Sales, Retail Sales, Imports, Exports, Apparent Consumption,, Suggested Retail Prices and Trade Balance with Selected Countries for Motor Vehicles, 1964-84, October, 1985.

Table 2-2

U.S. Imports of Automobiles from Japan
in quantity Units

Year	Imports	U.S. Market % Share
1975	695,573	8.50
1976	1,128,936	10.90
1977	1,341,530	11.88
1978	1,563,047	13.61
1979	1,617,828	15.20
1980	1,991,525	22.36
1981	1,911,525	22.31
1982	1,801,185	23.70
1983	1,871,192	20.07
1984	1,948,714	18.44

Source : USITC, The U.S. Automotive Industry, U.S. Factory Sales, Retail Sales, Imports, Exports, Apparent Consumption, Suggested Retail Prices, and Trade Balances with Selected Countries for Motor Vehicles, 1964-84, October, 1985

Auto Workers filed a joint petition with the United States International Trade Commission (USITC) for relief from imports. Section 201 of the Trade Act of 1974 made this relief possible.¹ Their petition stated that the U.S. automobile industry was being substantially injured by foreign car imports. In order to recover from this injury, they required temporary protection from imports either by increased import tariff or by quantity restriction. After a six month investigation, the USITC determined that automobiles were not being imported into the United States in such increased quantities as to be a substantial cause of serious injury, nor was there the threat of serious injury to the U.S. auto industry. The economic recession was viewed as the main factor in the domestic industry's downturn.

However, the calls for protection from automobile imports, especially from Japan did not subside with the USITC's negative determination. The domestic industry put pressure on the U.S. Congress and the American public. The industry argued that the failure to foresee substantial

1

Under Section 201 of the Trade Act of 1974, the USITC is empowered to recommend to the President whether the domestic industry requires a temporary protection from imports. If the USITC's determination is affirmative, the recommendation can take in the forms of increased tariff and quantity restriction. Under this statute, the President reserves the right to provide import relief.

increases in oil prices was not the industry's fault. In order to compete effectively with the Japanese imports several years of temporary protection would be required.

The domestic industry was successful in convincing Congress and the notion of limiting the quantity of Japanese automobile imports gained broad support. In 1981, Senators John Danforth (R-MO) and Lloyd Bentsen (D-TX) introduced legislation to restrict Japanese car imports to 1.6 million units a year. Rather than risk a possible political defeat President Reagan, only a few months into his first term of office, initiated an informal negotiation with the Japanese government for a Voluntary Export Restraint (VER) on automobile exports to the United States. The Japanese in turn were convinced that the VER might be beneficial in terms of maintaining a reasonable share of the U.S. market without jeopardizing their overall bilateral trade relationship.

As expected the Japanese auto makers vehemently denounced the VER, at least in public. They contested the VER on the grounds that it violated free trade principles. The Japanese Ministry of International Trade and Industry (MITI) went ahead and announced the terms of the VER on May 1, 1981. The essence of the agreement was that Japan's

auto exports to the United States were to be reduced by 7.7 percent for the Japanese fiscal year of April 1, 1981, through March 31, 1982, from the previous fiscal years level of 1.82 million units to 1.68 million units. A second year of export restraint was to be considered after observing the effect of the first year of the restraint in the U.S. market performance.

Subsequently, MITI decided to continue the VER for the second year without a change in the restraint level. But for the third year, the level was raised to 1.85 million units. For the fourth and fifth years, the level again was raised to 2.3 million units. As for the fiscal year 1987, the MITI once again decided that the VER would remain in force and the restraint level was to be the same as the previous year's.

The rationale behind any VER arrangement is to provide breathing room for the domestic industry to make the necessary adjustments to world competition; specifically, in this case the adjustment was competition in the small car market. It is anticipated that during any VER implementation period, the U.S. companies would undertake substantial changes in their manufacturing processes, such as launching major investment programs designed to lower production costs. Above all, it was hoped that after a few

years the domestic industry would be able to compete effectively once again without protection from import.

From the consumer's point of view the auto VER calls for careful examination. If the American consumer is going to be asked to pay for further import restraint on automobiles, it is essential to understand the cost they are currently paying for this sort of protectionist measure. The economic cost of the restriction must be compared with its benefits in order to evaluate the restriction's overall impact. Therefore, the major focus of this paper is to try to estimate the cost of imposing the VER to the consumer will be examined as well as the cost effect on the whole U.S. economy.

II. ASSUMPTIONS AND MODEL

ASSUMPTIONS

Japanese and U.S. Automobiles are Imperfect Substitutes

The first issue is whether to treat the Japanese automobile as homogeneous with or differentiated from domestic automobiles. In the late 1970's and early 1980's, Japanese automobiles were small, gas-efficient, and relatively inexpensive compared to domestic automobiles. But because of the continued upgrade in the product lines by the Japanese makers, the situation has reversed. In fact, some models of the Japanese cars are priced higher than equivalently sized U.S.- made cars. Nevertheless, it is a reasonable assumption to treat Japanese automobiles as differentiated from domestic automobiles. What this means is that although Japanese automobiles are good substitutes for U.S. automobiles, they are not perfect substitutes.

Cross - Elasticity of Demand Between Japanese and Non-Japanese imports is Zero

Another important assumption is the relationship between Japanese automobiles and non-Japanese automobiles. While Japanese automobiles were under the VER,

non-Japanese imports did not gain a significant amount of market share in the U.S. import market, as a result, it seems reasonable to treat Japanese and other imports as differentiated. Therefore, it is assumed that United States consumers have aggregate demand functions for Japanese imports, other imports, and domestic automobiles. For simplicity the cross elasticity of demand between non-Japanese imports and others is taken to be zero. This assumption allows us to ignore the effect on non-Japanese imports of the VER and concentrate on Japanese imports and United States sales.

Supply Schedule for Japanese and U.S. Automobile

Finally, the supply schedule for the Japanese automobile is assumed to be infinitely elastic and for the U.S. automobiles is assumed to be upwardly sloped.

MODEL

The model is depicted graphically in Figure 2-1. Panel A is the market for the domestic product and Panel B is the market for the Japanese product. Since the products are related, the demand curves depend on the price of the competing good as well as the usual own price dependence. In other words, the price of the Japanese product is a

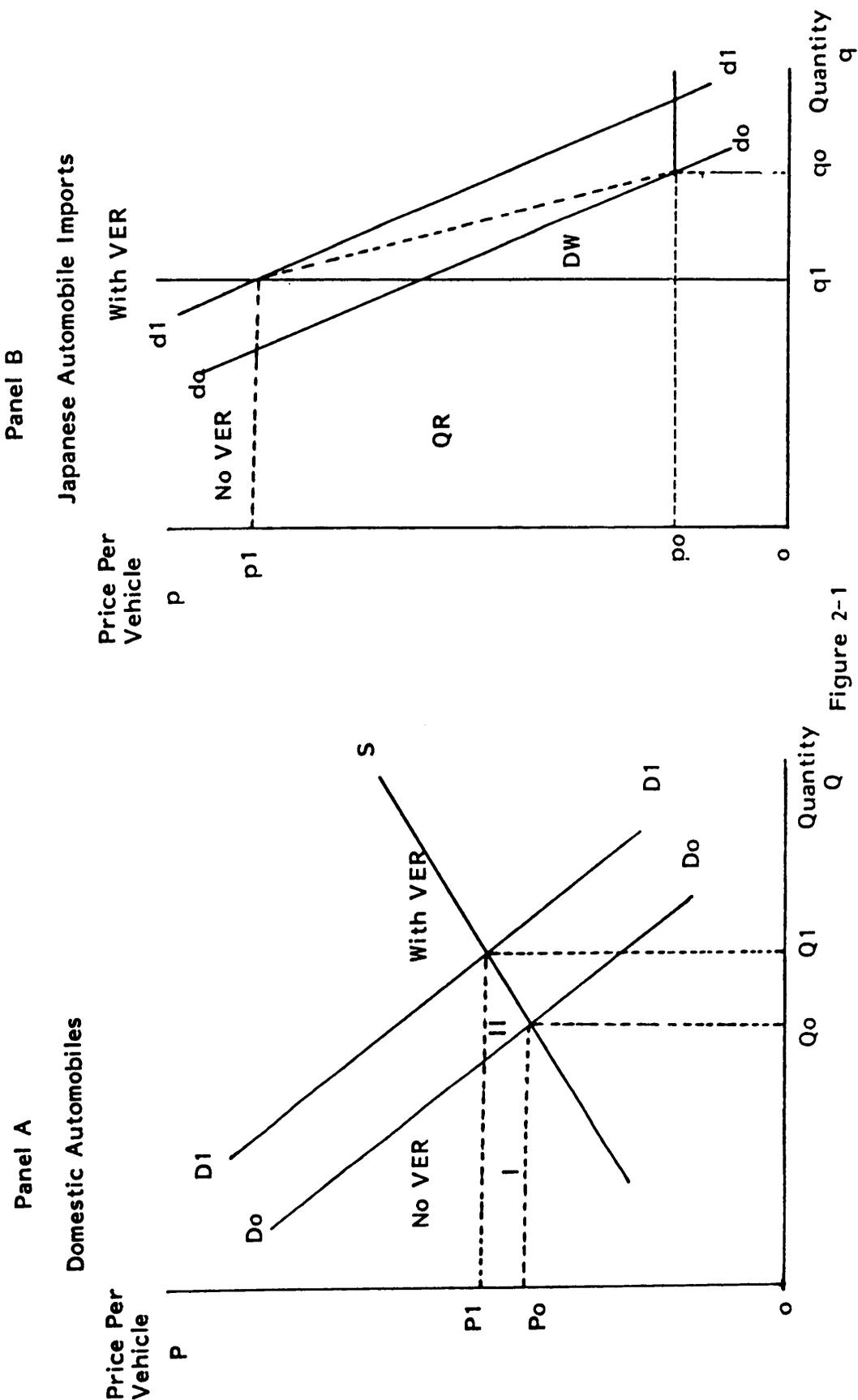


Figure 2-1

Estimated Effects of the Japanese VER on Automobiles

determinant of the demand for the domestic product and conversely.

The adjustment to a new equilibrium after the imposition of the VER may be explained as follows.² Prior to the imposition of VER, the initial equilibrium points are (Q_0, P_0) for the U.S. cars and (q_0, p_0) for the Japanese cars. The price and quantity of Japanese automobile market is determined by the intersection of supply curve, s and the demand curve, d_0 . After the VER is imposed the demand curve, d_0 shifts upward to d_1 and the quantity is fixed at q_1 . Therefore, the new equilibrium is now at (q_1, p_1) , a point where the fixed quantity, q_1 intersects the new demand curve d_1 . In the U.S. automobile market, with the VER the demand curve also shifts upward to D_1 and the new equilibrium point is now at (Q_1, P_1) .

The above interaction can be translated into a simple model that requires specification of demand and supply equations for both the U.S. automobiles and the Japanese automobiles with and without the VER. The demand equations must also incorporate the cross elasticity effect of the prices of each other. The demand and supply equations for both the Japanese and the U.S. automobiles

2

As a matter of convenience upper case letters denote the price and quantity of the U.S. automobiles and lower case letters are used for the price and quantity of the Japanese automobiles.

are assumed as follows:

$$(1) Q = a_0 + a_1P + a_2p \quad - \quad \text{Demand for U.S. Cars}$$

$$(2) q = b_0 + b_1P + b_2p \quad - \quad \text{Demand for Japanese Cars}$$

$$(3) Q = c_0 + c_1P \quad - \quad \text{U.S. supply}$$

$$(4) f(p) = \begin{cases} q_1 & p > p_0 \\ 0 & p < p_0 \end{cases} \quad - \quad \text{Japanese supply under VER}$$

$$(5) s(q) = p_0 \quad - \quad \text{Japanese supply price before VER}$$

The equations (1) and (2) are the demand curves for the U.S. and Japanese automobiles respectively. Equation (3) is the supply curve for U.S. automobiles. Equation (4) implies that the Japanese will not export automobile at a price less than p_0 , but they can only export up to the VER agreement level at the price above p_0 . Equation (5) states that the Japanese will supply any quantity of automobiles in the relevant range at the price p_0 .

The analysis here is one of comparative statics, in which all other variables such as income and taste are held constant. Therefore, other variables affecting the equilibrium prices and quantities are held constant.

The next step is to estimate the coefficients in equations (1) through (4). The best estimates available are from the Charles River Associates report which was prepared for the Department of Labor in 1976.³ Utilizing what they assess to be a consensus of estimates that the overall elasticity of demand for automobile is unity, and that their model reduces the four elasticity dependent coefficients in equation (1) and (2) to one coefficient. This coefficient, denoted e , is defined by:

$$e = (d \ln q/Q) / (d \ln p/P)$$

They call this the relative elasticity, but it is an elasticity of substitution. If it is -1, for example, it means that a ten percent increase in the relative price of Japanese automobiles results in a 10 percent decrease in the relative share of Japanese auto sales in the United States. Charles River Associates estimate the relative elasticity utilizing many different models. Their estimate $e = -2$ being the most representative. With this estimate their model implies $a_1 = -888.04$, $a_2 = b_1 = 342.8$ and $b_2 = -2,008$.

The estimate of 7,143 for c , in equation (3) is obtained from the

3

Charles River Associates, 1976. "Impact of Trade Policies on the U.S. Automobile Market", Prepared for the Department of Labor, Bureau of International Labor Affairs.

report done by the Federal Trade Commission. It is calculated from data contained in the Charles River Associates report.⁴

Substituting these estimated values into equations one through four yields:

$$(1) \quad Q = a_0 - 830.94 P + 223.63p$$

$$(2) \quad q = b_0 + 223.63P - 954.87p$$

$$(3) \quad Q = c_0 + 7143P$$

$$(4) \quad f(p) = q_0 p > p_0 \quad \text{with the VER}$$

$$(5) \quad s(q) = p_0 \quad \text{no .VER}$$

Estimation of Linear Demand Curve Parameters

The demand curve parameters used in the model are derived as explained below:

4

Tarr, David G., And Morris E. Morkre. 1984., Aggregate Costs to the United States of Tariffs and Quotas on Imports: General Tariff Cuts and Removal of Quotas on Automobiles, Steel, Sugar, and Textile, FTC, Dec. 1984.

From the basic model described earlier a general constant elasticity formulation of the set of demand curves for the U.S. and Japanese automobiles can be written as:

$$(6) \quad \log q = b \log p + c \log P;$$

$$(7) \quad \log Q = g \log p + h \log P;$$

Where, b = the own price-elasticity of Japanese car demand;

c = the cross price-elasticity of Japanese car demand;

g = the cross price-elasticity of domestic car demand;

h = the own price-elasticity of domestic car demand.

The coefficients b and h are expected to be negative, and c and g are expected to be positive.

If the ratio of Japanese to U.S. sales, (q/Q) depends only on the ratio of Japanese to U.S. car price (p/P) , (i.e., if the effect on the Japanese to U.S. car sales ratio of an x percent rise in Japanese car prices is the same as the effect of an x percent fall in U.S. car prices), then we can write

$$(8) \quad A = b - g = h - c,$$

where A is an elasticity of substitution.

Further assume that $dq/dp = dQ/dP$ (i.e., that the rate of change in Japanese car sales with respect to a one unit change in U.S. car prices is the same as the rate of change in U.S. sales with respect to a one unit change in Japanese car prices). Then, converting elasticities into slopes at current prices and output, we obtain

$$(9) \quad c = g \cdot Q_1 P_1 / q_1 p_1,$$

where Q_1 is current U.S. sales, P_1 is average current U.S. price, q_1 is current Japanese sales, and p_1 is average current import price. This follows

$$dq/dP = c q_1 / P_1 \quad \text{and} \quad dQ/dp = g Q / p_1$$

at the points q_1, P_1, Q_1, p_1 .

Then, combining Equations (8) and (9), we get

$$(10) \quad b - g = h - g \cdot Q_1 P_1 / q_1 p_1 \quad \text{or}$$

$$(11) \quad b = h + g (1 - Q_1 P_1 / q_1 p_1)$$

To obtain all four parameters of the system of equations, we need one more equation in h and g . We can obtain this extra equation by using the value of the total

U.S. market elasticity of demand for automobiles. We have assumed this to be -1.

If we let the market elasticity be equal to -1, then we can express $d(Q+q)/dp$, the change in total new car sales with respect to a given change in average new car price, P_a , at the point q_1, Q_1, p_1, P_1 as

$$(12) \quad d(q+Q)/dP_a = dq/dP_a + dQ/dP_a = -1 * (Q_1 + q_1)/P_a = - (q_1 + Q_1)/P_a$$

Linearizing the constant elasticity equations stated earlier at the values of q_1, Q_1, p_1, P_1 we obtain

$$(13) \quad q = k_1 + [(h + g - g * Q_1 P_1 / q_1 p_1) * q_1 / p_1] * p + (g * Q_1 P_1 / q_1 p_1) (q_1 / P_1) * P$$

and

$$(14) \quad Q = k_2 + g * (Q_1 / p_1) * p + h(Q_1 / P_1) * P$$

Adding the above two equations and rearranging terms yields,

$$(15) \quad (q + Q) = (k_1 + k_2) + [h * q_1 / p_1 + g * [(q_1 + Q_1) / p_1 - Q_1 P_1 / (p_1)^2]] p + Q_1 * (g / p_1 + h / P_1) * P$$

For an equal change in both p and P

$$(16) \quad d(Q + q) / dp + d(Q + q)/dP = d(Q + q)/dpa + \\ -(Q_1 + q_1)/Pa$$

Combining equations (15) and (16), and with the equation of (8) we have two equations in the unknowns g and h .

$$(17) \quad hq_1/p_1 + g * [(q + Q)/p_1 - (Q_1P_1/p_1^2)] + Q_1 [g/p_1 + \\ h/P_1] = -(q_1 + Q_1)/pa$$

$$(18) \quad h = A + g * Q_1P_1/q_1p_1$$

Substituting equation (8) into equation (17), and rearranging terms, we obtain

$$(19) \quad g = \frac{-q_1 + Q_1/pa - A * (q_1/pa + Q_1/pa)}{(q_1 + 2Q_1)/p_1 + (Q_1^2 / q_1p_1)} \quad (12)$$

Substituting the above equations into the equations for Q and P stated earlier, we get estimates of the slopes of the demand curves in terms of g and h :

$$(20) \quad a_1 = dq/dp = [h + g \{1 - (Q_1P_1/q_1p_1)\}] * q_1/p_1$$

$$(21) \quad a_2 = dq/dP = g(Q_1/p_1)$$

$$(22) \quad b_1 = dQ/dp = g(Q_1/p_1)$$

$$(23) \quad b_2 = dQ/dP = h(Q_1/P_1)$$

Using 1980 data, We let $Q_1 = 6,255,000$, $q_1 = 1,912,000$, $p_1 = 4,965$, and $P_1 = 8,912$. The average price p_a , is computed by taking sales weighted average of the both Japanese and U.S. prices. Substituting these values into equations for g , h , a_1 , a_2 , b_1 , and b_2 we obtain following:

$$a_1 = -70.2 + 411.85A$$

$$a_2 = -223.6 - 223.6A$$

$$b_1 = -223.6 - 223.6A$$

$$b_2 = -711.6 + 121.7A$$

Since A is assumed to be -2 , $a_1 < 1$, $a_2 > 0$, $b_1 > 0$, and $b_2 < 0$ for the entire range of estimated values of A .

D. Estimated Japanese Supply Price During VER

With the basic model established, the next crucial task is to develop a method from which the Japanese supply price without the VER, p_0 can be estimated. These are the hypothetical prices that would have prevailed if there were no VER in effect. There were substantial price increases during the years the VER was in effect. It would be incorrect, however, to attribute the entire rise in the prices to the VER. Clearly, there are a number of factors which have contributed to the increase in prices. In particular there are three important factors which must be incorporated in estimating hypothetical Japanese supply prices. They are: (1) rise in prices of the inputs used in manufacturing automobiles in Japan; (2) shifts in the exchange rate of the dollar against the Japanese Yen; and (3) improvement in the quality mix of Japanese cars toward more expensive vehicles. A brief discussion including the data to be used in each of the three factors are as follows:

Input price increase - Selection of this factor is self-explanatory. The Bank of Japan published Price Indexes Annual, in which input and output price indices of manufacturing industries by sector are available.

Exchange rate shift - Since the Japanese supply price is denominated in yen and converted to the U.S. dollars under the prevailing exchange rate, a change in the exchange rate would shift the supply price in terms of the U.S. dollars. This is an important factor in that there have been substantial fluctuations in the exchange rate between the yen and the dollar in recent years.

Quality upgrade - This factor is certainly subject to a controversy since it is difficult to measure the amount of price increase with respect to quality improvement, but there also is a question as to whether the quality improvement should be a factor in the increase in prices in the short-run. If the VER induced Japanese suppliers to upgrade their product mix during the VER period in order to earn larger profits on each sale in the U.S., then this factor should certainly be considered in order to prevent overestimating the effects of price increase.

Regarding this matter the USITC in their report to the Congress states that there is evidence that sales of larger Japanese automobiles equipped with more options increased while sales of smaller stripped-down models declined during the VER period. The USITC does not included this factor in their report. The reasons for exclusion are that first of all the effect of upgrading is fairly small; and

secondly, the shift toward larger, more expensive Japanese cars would have occurred even if a free market had existed during the VER period. Lastly, they also cite the evidence that sales of larger domestic models, loaded with options also increased during VER and sales of small, cheaper cars declined.⁵

The Federal Trade Commission on the other hand, included the quality upgrade as a factor in price increases for their estimate of effects of the VER. They quote the result reported by Feenstra that the Japanese increased the share of their higher priced vehicles, namely the Toyota Cressida, the Nissan Maxima, and the Toyota Supra.⁶

In order to be conservative in measuring the effects of the VER, the quality upgrade factor is included in this analysis. The estimate used here is the result of hedonic regressions reported by Feenstra that the Japanese supply price would have risen by six percent in 1980 and 1981. This six percent figure is applied as a standard for other periods of the VER.

⁵ USITC Publication 1648, A review of Recent Developments in the U.S. Automobile Industry Including An Assesment of the Japanese Voluntary Restraint Agreements, Feb. 1985

⁶ Tarr, David G., and Morris E. Morkre. 1984. Aggregate Costs to the United States of tariffs and Quotas on Imports: Gce that they received for the automobiles.

For the Japanese price data, a choice had to be made between using manufacturers suggested retail price or some measure of average price, such as unit value. Unit value was selected for two reasons. First since there is going to be an adjustment made for the quality upgrade and model mix, major problems as to the use of unit values are partially solved. Second, suggested retail price or the actual transaction price which includes dealer profits and other costs that do not go to the Japanese manufacturers, and in some estimates, the dealer's additional profit mark-up amounted to over a thousand dollars per automobile. Therefore, using the manufacturers' suggested retail price or actual transaction price would be overestimating the losses to the U.S. economy. Furthermore, in order to accurately estimate the quota rents captured by the Japanese manufacturers, it is imperative to use the unit price of imports as this is the

General Tariff Cuts and Removal of Quotas on Automobiles, Steel, Sugar, and Textile, FTC, Dec. 1984.

Table 2-1
Japanese Average Unit Price

Year	Unit Price (In Dollar)	Quantity (1,000 Units)
1980	4,132	1,992
1981	4,965	1,912
1982	5,334	1,801
1983	5,748	1,871
1984	6,337	1,949

Source : USITC

Table 2-2
U.S. Average Price (Actual Transaction Price)

Year	Unit Price (In Dollar)	Quantity (1,000 Units)
1980	7,609	6,340
1981	8,912	6,255
1982	9,865	5,047
1983	10,595	6,379
1984	11,159	7,621

Source : Department of Commerce

Table 2-3

Japanese Wholesale Price Index (Transportation)

Year	Index
(1080 = 100)	
1980	100
1981	102.6
1982	105.5
1983	105.4
1984	106.5

Source : Bank Of Japan,
Price Indexes
Annual, 1985.

Table 2-4

Exchange Rate Between U.S.Dollar and Japanese Yen
(Yens Per Dollar)

Year	Japanese Yen
1980	225.68
1981	220.11
1982	248.24
1983	237.37
1984	237.31
1985	237.70

Source : Economic Report of the
President, 1987

III. THE COSTS AND BENEFITS

Estimates of the losses to the U.S. economy, costs to the U.S. consumers, gains to the U.S. producers, and the quota rents captured by the Japanese producers are summarized in the Table 3-1.

A. Consumer Cost

With the assumption that consumers' surplus is a good measure of welfare change, the consumer costs can be estimated by measuring the changes in consumer surplus after the imposition of the VER. In the two market situation, the lost consumers' surplus is equal to the sum of rectangle (I) and triangle (II) in Panel A of Figure 2-1 plus the rectangle (I) and triangle DW in Panel B of the figure. For 1981, it is calculated as $(\$9 * 6,255,000) + (1/2) * (6,255,000 - 6,190,000) + (\$368 * 1,922,000) + (1/2) * (2,435,000 - 1,992,000) * (\$368) = \$870,570,500$.

Estimates show that the consumer costs from the VER grew substantially from 1981 through 1984. The higher prices on Japanese cars alone raised the consumer costs from \$733 millions in 1981 to \$2.2 billion in 1984.

TABLE 3-1

Estimate of the Losses to the U.S. Economy, Costs to Consumers, Gains to the U.S. Producers, and Quota Rents Captured by the Japanese as a Result of the VER

(in millions of U.S. dollars)

	1981	1982	1983	1984
	(Estimates in 1986 dollars in parentheses [*])			
Losses to the U.S. Economy	814 (981)	2,271 (2,580)	2,197 (2,418)	3,100 (3,272)
Consumers' Losses	871 (1,050)	2,379 (2,702)	2,337 (2,572)	3,200 (3,378)
U.S. Producers' Gains	56 (68)	108 (122)	139 (153)	100 (106)
Quota Rents Captured by Japanese	733 (884)	1,670 (1,897)	1,652 (1,818)	2,204 (2,327)

* The 1986 numbers are equal to 1.2056 times the 1981 estimates, reflecting a 20.56 percent increase in the consumer price index from 1981 to 1986. See the Economic Report of the President, 1987, p.307.

The effects of the import restrictions on prices of the U.S. cars are more modest in comparison to the Japanese cars as can be seen in the Table 3-2.

Table 3-2
VER Induced Price Increase
(Units in Million of dollars)

	1981	1982	1983	1984
Estimates in 1986 dollars in parentheses)				
Increased costs of Japanese cars	733 (884)	1,670 (1,897)	1,652 (1,818)	2,204 (2,327)
Increased costs of U.S. cars	56 (68)	108 (122)	139 (153)	100 (106)
Increase costs per car of all Cars	95 (144)	139 (295)	208 (229)	241 (254)
(Units in Dollar)				

B. U.S. Producers' Surplus

The areas (I) and (II) of Panel A of the figure II-1 represent the gains in the U.S. producers' surplus. for 1981, the producers' gain is calculated as

$$(\$9 * 6,255,000) + (1/2) * (6,255,000 - 6,190,000) * (\$9) = \$56,002,055.$$

A direct benefit of the VER to the domestic automobile industry is that an increase in U.S. sales and output resulting from imposition of VER increases employment in the U.S. automobile industry. This direct employment effect is measured by the estimate described in an August 1983 issue brief that was prepared by the Congressional Research Service of the Library of Congress.¹ It states that an increase in output of 14 cars during a given year results in the creation of one additional job the the automobile industry. Based on this assumption employment gains for the U.S. automobile industry are shown in Table 3-3:

Table 3-3

Employment Gain As a Result of VER

	1981	1982	1983	1984
Employment Gains	4,682	4,786	12,857	6,643
(unitd in Persons)				

¹ Congressional Research Service, "The fair Practices in Automotive Product Act (HR 5133):An Economic Assessment," in Domestic Content Legislation and the U.S. Automotive Industry, For the Subcommittee on Trade of the Committee on Ways and Means, U.S. GPO, August, 1982.

C. Japanese Quota Rents

The rectangle QR in Panel A represents rents captured by the Japanese manufacturers. In 1981, they are willing to supply at an estimated price of \$4,591, but received \$4,965 for all 1,992,000 cars. Therefore, the Japanese manufacturers captured \$733 million in quota rents from the VER for 1981. The quota rents grew significantly over the 4 year period, amounting to \$2.2 billion in 1984.

D. Losses to the U.S. Economy

If we define deadweight losses to the economy as the amount lost by consumers which is not captured or redistributed to other sectors of the economy, then the losses to the U.S. economy are the sum of the consumers' surplus change minus the u.s. producers' surplus change. In 1981 losses is totalled at \$814 million.

IV. SUMMARY AND CONCLUDING COMMENTS

A. SUMMARY

The VER Increased Prices of Japanese Cars in the United States

According to the estimates, the import prices of Japanese automobiles sold in the United States in 1984 are estimated to have averaged \$1,131 more per car as a result of the VER. The estimated VER-induced price increase of Japanese cars rose from \$368 in 1981 to over a \$1,000 in 1984

The VER-Induced Price Increase Also Effected New Domestic Car Sales Price

Although the margin of price increase was not as large as it was for Japanese cars, domestic car sales prices also increased as a result of the VER. The amount of increase in 1981 is estimated to be \$65 and it reached as high as \$150 in 1983.

It is also probable that the VER caused an increase in used-car prices, as many buyers turned to the used-car market because of the higher prices of both Japanese and domestic cars.

The Total Cost to U.S. Consumers
as a Result of the VER During 1981 - 1984
was \$9.7 billion Measured in 1986 Dollars

The estimates show that the VER cost U.S. consumers an additional \$1.0 billion in 1981, \$2.7 billion in 1982, \$2.6 billion in 1983, and \$3.4 billion in 1984, for a combined total of \$9.7 billion during 1981 - 1984.

In the Absence of the VER the Japanese Would Have
Sold 1.6 Million More Cars in 1984

Based on the estimates, if the VER was not in effect, the Japanese manufacturers would have sold 1.6 million more units of cars in the United States market.

The VER Might Have Created 29,000 New Jobs in the
U.S. Automobile Industry

It is probable that the VER added about 4,600 new jobs in 1981 and by 1984 the total new jobs created because of the VER could have been as high as 29,000. The consumer cost of creating each new job was \$334,000.

According to the USITC estimates the Japanese could probable supply 2.4 - 2.5 million units of cars to the United States. Their estimates are based on actual survey data.

B. Evaluation of Estimates

There are several reasons to believe that the estimates reported in this paper is biased in several respects. A brief discussion of these follows.

Markups Above List Price for Japanese Cars

Because of a lack of actual transaction price data for the Japanese automobiles sold in the United States, the markup above list price apparently being received by the dealers of Japanese cars in response to the VER was ignored. Some studies estimate these markups at about \$1,000 per vehicle sold. The analysis here has used the import price which only reflects the increase in revenue received by the Japanese manufacturers as a result of the VER. It does not take into account any additional increased costs to the U.S. consumers resulting from increased costs of purchasing Japanese automobiles. Therefore, the consumer cost estimate is biased downward.

Effect of the VER on Used Car Prices

According to the USITC investigation, the Bureau of Labor Statistics index of used car prices climbed more rapidly than the prices of new cars while the VER was in

effect. From 1976 through, the index increased by only 24 percent, but from 1981 through 1984, it nearly doubled, rising by 81 percent during this 4 year period. It is very likely that the increase in price was partly because of an increase in demand on the part of buyers who turned to the used car market in response to the increase in the prices of new automobiles. Not including the effects on used car price also result in underestimating the cost of the VER.

Exchange Rate Effect

One macroeconomic effect of the VER is that it tends to strengthen the currency of the restricting country as it limits the supply of currency that would otherwise have entered the foreign exchange market for purchases of goods that are under restriction. In the case of the automobile VER Agreement the exchange rate effect probably was not significant. Nonetheless it is worth noting because U.S. consumers have benefited from lower prices of imported goods as a result of the appreciation of dollar due to the VER. But at the same time the U.S. exporters would have experienced a decline in their export earnings because the strong dollar has made their products less competitive in the world markets.

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