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An empirical investigation of product variety measurement in trade

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Abstract:

The most two common methods of quantifying product variety in empirical trade include the simple count-based and the Feenstra (1994) measures. This paper compares these two measures in practice by testing the Gagnon (2007)'s specification for the Japanese imports.

It finds that for the Gagnon-type equation, the simple count measure is significant in explaining the Japanese imports while the Feenstra's measure of product variety is found to be not significant. This finding implies that although the Feenstra's measure of product variety is more sophisticated and well-recognized in empirical trade, it is not necessarily applicable to all the cases. The result also highlights the need to further investigate product variety measurement in trade.

JEL classification: C33, F14

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I. Introduction

Product variety, which plays an important role in monopolistic competition and trade, was originally examined in growth theory and marketing literatures. Recently, there has been an increasing tendency to study about product variety in international trade. A growing literature on product varieties uses highly disaggregated trade data to empirically test different aspects of product varieties.

Gagnon (2007), recently, used detailed trade data to test the Krugman (1989)'s model with the US import growth and found evidence that product variety had a strong correlation to the US imports. This finding, in fact, provides robust support for Krugman's argument that countries can grow without suffering deterioration in their terms of trade by producing new varieties of goods.

Gagnon's work, however, limits its scope within a simple measure of product variety. Specifically, it counts the categories of the US manufactured imports without exploring the well-known alternative approach to product variety in trade proposed by Feenstra (1994).

It is the purpose of this paper to seek further empirical evidence on the desirability of the two different approaches to product variety measurement, namely the count-based and Feenstra's measure of product variety by estimating Gagnon (2007)'s model for Japanese imports.

While this paper draws on Gagnon (2007), it extends Gagnon's work in the following aspects: firstly, in contrast to Gagnon's study of the US, our study extends to the case of Japan. Secondly, Gagnon carried out only cross-sectional regressions while we conduct the estimation on panel data. Lastly and most significantly, we use both the simple measure and the Feenstra's measure of product variety which enables us to have a comparison between the most two common approaches to product variety in empirical trade.

The paper proceeds as follows: Section II summarizes some previous related studies. Section III describes the research methodology and data. Section IV presents the empirical results and lastly, conclusions are presented in Section V.

II. Related Studies

Product variety exists as an integral part of a market economy for the fact that on one hand consumers' needs and requirements are diverse and changing, and on the other hand, firms, for their profit objective, look for ways to satisfy their clients' demands. The market mechanism also puts firms under competition pressures to differentiate their products from those of their opponents. As a result of this process, new varieties of both intermediate inputs and final goods are continually invented.

Product variety in the most common sense refers to either the number of product groups or, at a more detailed level, the number of variants within a specific group of product, corresponding to the number of *brands* or the number of *models*. While the concept of product variety is quantitative itself in nature, it is not easily measured in the real world. According to Feenstra and Kee (2004), only recently has the literature started to quantify product variety. To our observation, empirical studies on product variety appear to accept some level of details higher than brand names given the difficulties in collecting data at the product level. Very often, product variety is measured at a product group level in standard classifications.

Product variety is considered closely linked to economic growth. According to the endogenous growth theory (Romer 1990 and Grossman and Helpman 1991), capital accumulation alone cannot sustain economic growth in the long run because of diminishing returns. Economic growth is sustained in the long run, instead, due to technological progress which takes the form of an expansion of the number of product varieties. Product variety is often examined in relation to such microeconomic issues as competition, product differentiation and customer's demands.

While trade increases social welfare as it expands consumers' variety of choices (Lancaster 1958), this expansion in consumption choices can only be possible, after all when there are more varieties of goods. Product variety, therefore, can be regarded as one of the factors inducing trade.

Recently, a growing literature on product varieties uses highly disaggregated trade data to empirically test different aspects of product varieties. These studies, however, seem to adopt different methods of quantifying product variety. A commonly practice is to measure product variety by counting the number of categories of imported or exported goods, often at a detailed level (for example, Funke and Ruhwedel 2005). While this approach can be easily put into practice, it overlooks the nontraded goods as well as the domestically produced and consumed merchandise.

Regardless of this constraint, the trade-based product variety measures seem to have gained popularity. In practice, the studies of this strand often count the number of categories of goods exported based on highly disaggregated trade data such as SITC headings (e.g Frensch and Wittich 2009).

Feenstra's Measure of Product Variety

Another, more sophisticated, measure of product variety was developed by Feenstra (1994) under a CES function framework. For simplicity and in line with our over time comparison purpose, Feenstra's variety index is reproduced as follows:

Suppose there are two sets of inputs I_t and I_{t-1} available in a country at two periods t and t-1. I_t is the set of n inputs at period t, $I_t = (i_1, i_2 \ldots i_n)$ and I_{t-1} the set of m input at period t-1, $I_{t-1} = (i_1, i_2 \ldots i_m)$. As a result of innovation process, some old inputs become obsolete and disappear while some new inputs emerge in the next period; there are always, however, *s* common inputs available in both periods. Denote I_s as the intersection between I_t and I_{t-1}, we have $I_s = I_t \cap I_{t-1} = (i_1, i_2 \ldots i_s)$. The change in product variety over time ($\Delta \mathrm{VAR}_{t,t-1}$) is given by the following formula:

$$\Delta \mathrm{VAR}_{t,t-1} = \ln\left[\frac{\lambda_t(I_s)}{\lambda_{t-1}(I_s)}\right] = \ln\left[\frac{\sum_{j=1}^{n} p_{jt}q_{jt} \Big/ \sum_{j=1}^{s} p_{jt}q_{jt}}{\sum_{j=1}^{m} p_{jt-1}q_{jt-1} \Big/ \sum_{j=1}^{s} p_{jt-1}q_{jt-1}}\right] \qquad (1)$$

Where p_{jt} and p_{jt-1} are the prices of j^{th} input at periods t and t-1 respectively. Similarly, q_{jt} and q_{jt-1} are the quantities of the j^{th} input in the two periods.

As Feenstra's formula is somewhat complicated, Funke and Ruhwedel (2005) make it easier to understand by giving a concrete example which is reproduced as follows: Suppose there are two countries A and B producing two kinds of goods in the same year.

Table 1: Production of two goods in two countries

	Country A	**Country B**
Product 1	100	150
Product 2	50	0

Then product variety in country A relative to country B is given by:

$$\Delta \text{VAR}_{\text{Country A/Country B}} = \ln\left[\frac{\lambda_A(I_s)}{\lambda_B(I_s)}\right] = \ln\left[\frac{150/100}{150/150}\right] = \ln(1.5) \approx 0.45$$

According to Funke and Ruhwedel, this positive $\Delta \text{VAR}_{\text{Country A/Country B}}$ can be interpreted as greater product variety in country A than country B.

The Funke and Ruhwedel's above example compares product variety between two countries at a point in time. However, the Feenstra's formula, in fact, can be applied to changes in product variety in a single economy over time, as used in this paper.

While Feenstra's product variety index (1) seems to be more sophisticated than a simple count measure of varieties and popular in the international trade domain, its application in practice is still sparse. This may be due to the fact that product variety is a still new topic in empirical trade, but more importantly, the complexity involved with the calculations of Feenstra's product variety index may have hindered its application. Recent work which employs the Feenstra index includes Funke and Ruhwedel (2005) and Nguyen and Parsons (2009). They both employ highly disaggregated data trade; however, neither does a comparison of the two measures to see which one works better in practice. These papers are also not using variety for estimating an import demand function. For the purpose of contrasting the two common measures of product variety with each other, we calculate both a count-based measure and the Feenstra index of variety in this paper and test one by one with the Gagnon (2007)'s equation to see the difference between the two.

Gagnon's Approach

According to Gagnon (2007), most macroeconomic models based on Armington assumptions imply that in conducting trade, a fast-growing country tends to suffer either a reduction in its trade balance or deterioration in its terms of trade.

In contrast with standard macroeconomic models, however, Krugman (1989) argues that countries can grow without suffering deterioration in their terms of trade by producing new varieties of goods. Gagnon (2007) tests the Krugman's model with the US import growth and finds evidence that product variety has a strong correlation to the US imports. In his paper, Gagnon, however does not use the Feenstra's index. Instead, he measures product variety by counting the categories of the US manufactured imports from various countries.

In addition, Gagnon (2007) also uses the gross domestic product (GDP) as a proxy for product variety. In doing so, clearly he implicitly assumes that GDP and product variety have a close link.

While the causality running from product variety to domestic income seems to be theoretically supported by endogenous growth models whereby a country can grow by producing new varieties of goods, the inverse direction of the relationship is not very clear. Whether a country's growth leads to an expansion of varieties or not is not obvious because in theory, a country can grow simply by increasing the output of the same stock of goods.

For this reason, we do not use the GDP as a varieties variable. Instead, we employ both the count-based and Feenstra's measures of product variety.

III. Methodology

1. Econometric Model

Based on Gagnon (2007)'s specification[1], we test the following equation:

$$IM_{it} = \beta_i + \beta_1 JY_t + \beta_2 FY_{it} + \beta_3 FVA_{it} + \beta_4 XR_{it} + \varepsilon_{it} \qquad (2)$$

Where t and i index the time and source of imports respectively. IM_{it} is the real value of Japanese bilateral manufactured imports from source country i in the year t. JY_t and FY_{it} are respectively Japan's real gross national expenditures and the exporting country i's real income in the year t. FVA_{it} is a "*varieties*" variable measured by the formula (1) using Japanese SITC-2[2] manufactured imports at four-digit level. XR_{it} is the average real bilateral exchange rate between Japanese yen and the country i's currency (expressed as units of the Japanese yen per unit of a foreign currency) in the year t. ε_i is the error term, β_i, $\beta_1 \ldots \beta_4$ are parameters to be estimated. All variables are expressed in real terms and logarithmic form.

The next step is to calculate the Feenstra's measure of product variety and plug the results into equation (2). Specifically, we regress the following equation:

$$IM_{it} = \beta_i + \beta_1 JY_t + \beta_2 FY_{it} + \beta_3 SVA_{it} + \beta_4 XR_{it} + \varepsilon_{it} \qquad (3)$$

[1] Equation (6) in Gagnon (2007) is selected for our estimation.
[2] "*SITC-2*" stands for the Standard International Trade Classification, Revision 2

In which, SVA_{it} is a "*varieties*" variable measured by the number of SITC-2 manufactured goods categories at four-digit level that Japan imports from the source country i in the year t.

The sole difference between the two equations (2) and (3) is varieties variables used. In equation (3), the varieties variable is calculated from a simple count based measure of product variety while in equation (2), it is computed from the Feenstra's formula (1).

We expect signs of the parameters in equation (2) and (3) as follows. One would expect a rise in Japanese imports when the domestic income increases and when there are greater availability of foreign exports. Therefore, the coefficients β_1 and β_2 are expected to have positive signs. For the coefficient β_3 which is our main parameter of interest, we predict a positive sign.

An increase in the exchange rate, or in other words, a depreciation of the Japanese yen makes imported goods become more expensive relative to domestic goods, and should, therefore, reduce the quantity demanded for the imported goods. For this reason, a negative sign is expected here for β_4. However, the effect of the exchange rate depreciation on Japanese bilateral import values are, in fact, not always clear-cut because a rise in import prices as a result of a weaker yen inflates the import values, at least in the short-run. In other words, one cannot predict whether β_4 has a positive or negative sign nominally because the effect depends also on the price elasticities of Japanese imports. For this reason, we use real terms. With a constant price, β_4 is expected to be negative in our specification.

2. Data

We used disaggregated annual Japanese import data for the period 1982 to 2005 with 38 major exporting countries to Japan included. The data are kept in levels for 38 countries and 24 years allowing for a panel structure. The sample countries are selected based on their weight in overall Japanese imports and data availability. Altogether, they account for over 90% of Japanese aggregate imports in 1995 (Appendix A).

In order to contrast our results with Gagnon (2007)'s, we only examine bilateral Japanese imports of manufactures. These manufactured imports fall under four SITC-2 headings 5, 6, 7 and 8, namely *chemicals and related products, manufactured goods classified chiefly by materials, machinery and transport equipment and miscellaneous manufactured articles respectively*. This results in, in total, 533 SITC-2 sub-headings at the four-digit level.

A variety is defined as a category of import goods at the four-digit SITC-2 level. All the disaggregated trade data are from the UN COMTRADE database.

Other data are collected from the following sources: Real bilateral exchange rates and real gross domestic product (GDP) values are obtained from the US Department of Agriculture (USDA) databases [3]. The Japanese gross national expenditure is calculated based on the World Bank's WDI database.

As the bilateral exchange rates between the Japanese yen and trading partner's currencies are often not available, cross exchange rates are computed through the US dollar vis-à-vis other currencies exchange rates. Real bilateral manufactured imports are calculated by deflating nominal bilateral manufactured imports by the Japanese import price index which is collected from the Bank of Japan's website.

[3] US Department of Agriculture database: http://www.ers.usda.gov/Data/Macroeconomics/

IV. Results

1. Feenstra's Measure:

We use the Feenstra's formula (1) to calculate the changes in product variety in each of 38 exporting countries to Japan. The results are presented in Appendix C.

As the formula (1) is rather complicated, we draw one out of 865 results to illustrate how the Feenstra's measure of product variety is worked out. For the example, we calculate the variety of Japanese imports from the US in 1984 compared to 1983.

In 1983, Japan imported 516 SITC-2 categories of manufactured goods from the US, valued at \$11,897,666,954 (Appendix D) and in 1984, it imported 515 categories, valued at \$13,404,815,553 (Appendix E). By comparing these two sets of goods, we identify an intersection which is a set containing 512 categories of goods. In other words, there are 512 categories of manufactured goods that Japan imported from the US both in 1983 and 1984. This common set of goods was valued at \$11,895,731,599 in 1983 and \$13,404,678,106 in 1984 (Appendix F).

Applying the formula (1), we have the Feenstra's measure of product variety for the Japanese imports from the US in 1984 compared to 1983 as follows:

$$\Delta \mathrm{VAR}_{1984,1983} = \ln\left[\frac{\lambda_{1984}(I_{512})}{\lambda_{1983}(I_{512})}\right] = \ln\left[\frac{\sum_{j=1}^{515} p_{j1984}q_{j1984} \Big/ \sum_{j=1}^{512} p_{j1984}q_{j1984}}{\sum_{j=1}^{516} p_{j1983}q_{j1983} \Big/ \sum_{j=1}^{512} p_{j1983}q_{j1983}}\right]$$

$$\Delta \mathrm{VAR}_{1984,1983} = \ln\left(\frac{13{,}404{,}815{,}553 / 13{,}404{,}678{,}106}{11{,}897{,}666{,}954 / 11{,}895{,}731{,}599}\right) \approx -0.000152426$$

In 1984, Japan no longer imported four categories of goods that it had imported in 1983. However, in this year, it imported three new categories of goods that it had not imported in the previous year. As the change in the number of goods categories as well as import values is not large enough, the Feenstra's measure result is generally very small. The same procedure applies to the other results as presented in Appendix C.

The regression results for the OLS regression (no random or fixed effects) are presented in the left panel while those for the fixed effects model (FEM) are reported in the right panel of Table 3.

In contrast to using the Feenstra's measure of product variety, all the coefficients are statistically significant and have the expected signs. With cross-section fixed effects chosen for estimation, the results seem to be even greatly improved by explaining about 95 percent of the variation in Japanese bilateral imports instead of 69% in the OLS regression. Again, all the slope coefficients bear their expected sign and are significant at the 1% level of significance.

Estimating equation (2) using the Feenstra's measure of product variety, we obtain the results presented in Table 2. The results for equation (2) in the basic form (no random and fixed effects)[4] are presented in the left panel and those for the fixed effect model (FEM) are in the right panel of Table 2.

[4] We use the Hausman test (1978) to choose between the fixed effects model (FEM) and the random effects model (REM) and found that the FEM is more appropriate for the data.

In the OLS regression, all the coefficients are statistically significant at the one percent level of significance except the varieties variable which has an unexpected sign and is insignificant.

Table 2: Using Feenstra's Variety Measure

Dependent Variable: IM

Variable	OLS (1)				FEM (2)			
	Coef.	SE	t-stat.	P-value	Coef.	SE	t-stat.	P-value
Constant	-25.56*	2.34	-10.92	0.00	-26.57*	2.14	-12.39	0.00
JY	2.27*	0.28	8.02	0.00	2.71*	0.27	9.93	0.00
FY	1.27*	0.04	32.38	0.00	0.89*	0.11	7.87	0.00
FVA	-0.08	0.07	-1.11	0.27	0.01	0.10	0.11	0.91
XR	-0.23*	0.02	-11.01	0.00	-0.45*	0.07	-6.56	0.00
R^2	0.59				0.95			
Observations	865				865			

Notes: a single (*) asterisk denotes one percent significance level. "Coef." indicates coefficients, "SE" standard errors and "t-stat" t statistics.

Similarly, estimating equation (2) using the FEM, we found that varieties variable is the only one which is statistically insignificant. By employing the FEM, the results seem to improve in that the coefficient of determination R^2 increases from 0.59 to 0.95 and the sign of the varieties variable changes from negative to positive. However, the varieties variable is still statistically insignificant at even 10%.

2. Count-based Measure:

Turning to the count-based measure of product variety, we calculate the number of categories of Japanese bilateral manufactured imports at the four-digit level for 38 countries for the years 1982 to 2005. A sample of the results is presented in the Appendix B.

The data on the count-based measure are then used to test equation (3). The regression results are reported in Table 3:

Table 3: Count Measure Approach

Dependent Variable: IM

Variable	OLS (1)				Fixed Effect Model (2)			
	Coef.	SE	t-stat.	P-value	Coef.	SE	t-stat.	P-value
Constant	-23.45*	1.93	-12.14	0.00	-25.22*	2.39	-10.56	0.00
JY	1.76*	0.24	7.42	0.00	2.40*	0.36	6.75	0.00
FY	0.90*	0.04	20.70	0.00	0.44*	0.12	3.66	0.00
VA	0.81*	0.05	15.28	0.00	0.66*	0.10	6.76	0.00
XR	-0.24*	0.02	-13.02	0.00	-0.36*	0.06	-6.17	0.00
R^2	0.69				0.95			
Observations	911				911			

Notes: a single (*) asterisk denotes one percent significance level. "Coef." indicates coefficients, "SE" standard errors and "t-stat" t statistics.

Surprisingly, the β_3 coefficient on the varieties variable bears an expected sign and is statistically significant at less than 1% level of significance. This is consistent with Gagnon (2007)'s results that product varieties have a strong positive correlation with the US imports.

3. Count-based versus Feenstra's Measures:

As our results show, the count-based measure of product variety appears to explain Japan's imports better than the Feenstra's measure. Specifically, the varieties variable using the Feenstra's measure is not correlated to Japanese imports while the use of the simple count measure found Japanese imports positively correlated to product variety.

This finding motivates our further investigation into the nature of the difference between the Feenstra's measure and a simple count one.

Generally speaking, the Feenstra's measure of product variety changes only slightly over time. In other words, the variety of Japanese bilateral imports from source countries do not change much based on the Feenstra's variety index. For example, from Appendix C, we can see that the Feenstra's variety index equals to -0.00015 in 1985 and -0.00001 in 1986. It means that the Japanese import variety from the US decreased a little in 1985 compared to 1984, and again declined somewhat in 1986 compared to 1985. As this index does not measure variety in either absolute terms or in terms of percentage change, it is quite abstract and hard to interpret quantitatively.

In fact, it may be far different from a simple-count based measure of variety. In the example of Funke and Ruhwedel (2005) in Table 1, although $\Delta \text{VAR}_{\text{Country A/Country B}} \approx 0.45$, we can only say Country A produces more variety of goods than Country B based on the positive sign of the results without knowing exactly how many more it is.

Instead, by using a simple count measure, we can simply tell that Country A produces two kinds of goods twice more than the number of goods that Country B produces. Another difference is that the Feenstra's index of variety depends on prices while a simple-count measure does not. In the Funke and Ruhwedel's example, if the price of product 1 is 200 instead of 100, as in Table 4:

Table 4: Production of two goods in two countries

Category	**Country A**		**Country B**	
	Quantity	**Price**	**Quantity**	**Price**
Product 1	1	200	1	150
Product 2	1	50	0	

The result will be:

$$\Delta \text{VAR}_{\text{Country A/Country B}} = \ln\left[\frac{\lambda_A(I_s)}{\lambda_B(I_s)}\right] = \ln\left[\frac{250/200}{150/150}\right] = \ln(1.25) \approx 0.22$$

The Feenstra's index of variety falls to 0.22 while the count-based measure remains the same in that the product variety is twice as large in Country A than in Country B.

Comparing product variety based on the value of goods, Feenstra's measure differs greatly from and even conflicts with the simple count measure. Consider an economy which produces three kinds of product in both periods 1 and 2.

Table 5: Production of Goods in 2 Periods

Category	Period 1		Period 2	
	Quantity	Price	Quantity	Price
Product 1	1	50	1	100
Product 2	1	150	1	500
Product 3	1	300	0	
Product 4	0		1	100

Product 3 is produced in the period 1 but become obsolete and is not produced in the period 2. Instead, Product 4 is produced for the first time in the period 2.

$$\Delta \text{VAR}_{\text{Period 2/Period 1}} = \ln\left[\frac{\lambda_2(I_s)}{\lambda_1(I_s)}\right] = \ln\left[\frac{700/600}{500/200}\right] = \ln(0.467) \approx -0.76$$

Obviously, both periods produce three types of products. However, if we use the Feenstra's measure, the product variety will be smaller in period 2 than in period 1.

Table 6: Production of Goods in 2 Periods

Category	Period 1		Period 2	
	Quantity	Price	Quantity	Price
Product 1	1	400	1	500
Product 2	1	50	0	
Product 3	1	50	0	
Product 4	0		1	6000

Similarly, in the Table 6, two goods are produced in period 2 while three goods are produced in period 1.

However, according to the Feenstra's measure, the product variety is larger in period 2 than in period 1:

$$\Delta \text{VAR}_{\text{Period 2/Period 1}} = \ln\left[\frac{\lambda_2(I_s)}{\lambda_1(I_s)}\right] = \ln\left[\frac{6500/500}{500/400}\right] = \ln(10.4) \approx 2.34$$

For the fact that the two approaches produce contradictory results as illustrated in the above examples, it is understandable that our regressions produce two different results for the count-based and the Feenstra's measure of product variety.

It is notable that a disadvantage of the Feenstra's measure of product variety is that the Feenstra's measure cannot be used in the case in which there is no intersection between two contrasting sets of goods. If $I_s = I_t \cap I_{t-1} = \emptyset$, ΔVAR becomes indefinite.

Table 7: Japanese Manufactured Imports from Oman in 1989 and 1990

Year	No.	Code	Description	Value ($)
1989	*1*	S2-6592	Carpets, carpeting and rugs, knotted	11306
	2	S2-7415	Air conditioning machines and parts thereof, nes	3659
	3	S2-7649	Parts, nes of and accessories for apparatus falling in heading 76	1797
1990	*1*	S2-6259	Other tires, tire cases, tire flaps and inner tubes, etc	4057
	2	S2-6821	Copper and copper alloys, refined or not, unwrought	2701385
	3	S2-7432	Parts, nes of the pumps and compressor falling within heading 7431	55524
	4	S2-7723	Fixed, variable resistors, other than heating resistors, parts, nes	1414
	5	S2-8741	Surveying, navigational, compasses, etc, instruments, nonelectrical	2059

While this situation may not be encountered when considering all kinds of manufactured goods produced in an economy, it will probably happen to measuring product variety using highly disaggregated trade data. For example, in our study, in 1989 Japan imported three categories of goods from Oman.

However, in the next year 1990, Japan did not import these categories again, but instead a totally new set of goods including five new categories (Table 7).

As there is no common set of goods between the two periods, the formula (1) becomes indefinite in this case.

V. Conclusion

Recent empirical studies on product variety tend to use highly disaggregated trade data for quantification purposes. The most two common quantitative approaches are the simple count measure and the Feenstra's measure of product variety. In this paper, we study both the simple count measure and the Feenstra's measure of product variety by applying the Gagnon (2007)'s specification to Japanese imports.

Our empirical results show that for the Gagnon-type equation, a simple count measure fits better than the Feenstra's measure of product variety for the case of Japanese imports. When the Feenstra's measure is used, the product variety is statistically insignificant at even the 10% level of significant while the count-based measure indicates a significant and positive correlation between product variety and Japanese imports. Our regression results derived from the count-based approach are consistent with Gagnon's empirical evidence on the US case in that product variety is strongly correlated to import growth.

This finding implies that although the Feenstra's measure of product variety seems to be more sophisticated and well-recognized in the spectrum of empirical trade, its application to highly disaggregated trade data is not necessarily valid for all the cases. As a result, in applying this measure in the real world, attention is needed on a case-by-case basis.

Appendix A: Major Exporters to Japan in 1995

No.	Country	Code	Japanese Imports ($bil.)	Share (%)	Cumulative Share (%)
1	USA	USA	75.9	22.6	22.6
2	China	CHN	36.0	10.7	33.3
3	Rep. of Korea	KOR	17.3	5.1	38.5
4	Australia	AUS	14.6	4.3	42.8
5	Indonesia	IDN	14.2	4.2	47.0
6	Germany	GER	13.7	4.1	51.1
7	Canada	CAN	10.8	3.2	54.3
8	Malaysia	MYS	10.6	3.2	57.5
9	United Arab Emirates	ARE	10.2	3.0	60.5
10	Thailand	THA	10.1	3.0	63.5
11	Saudi Arabia	SAU	9.7	2.9	66.4
12	United Kingdom	GBR	7.1	2.1	68.5
13	Singapore	SGP	6.9	2.0	70.6
14	France	FRA	6.7	2.0	72.6
15	Italy	ITA	6.4	1.9	74.5
16	Russian Federation	RUS	4.7	1.4	75.9
17	Switzerland	CHE	4.1	1.2	77.1
18	Brazil	BRA	3.9	1.2	78.2
19	Philippines	PHL	3.5	1.0	79.3
20	Chile	CHL	3.2	0.9	80.2
21	India	IND	2.9	0.9	81.1
22	Iran	IRN	2.8	0.8	81.9
23	Kuwait	KWT	2.8	0.8	82.8
24	China, Hong Kong SAR	HKG	2.7	0.8	83.6
25	Sweden	SWE	2.6	0.8	84.3
26	New Zealand	NZL	2.5	0.8	85.1
27	Netherlands	NLD	2.2	0.7	85.7
28	Ireland	IRL	2.0	0.6	86.3
29	Denmark	DNK	1.9	0.6	86.9
30	Oman	OMN	1.9	0.6	87.5
31	Viet Nam	VNM	1.7	0.5	88.0
32	Spain	ESP	1.5	0.4	88.4
33	Mexico	MEX	1.5	0.4	88.9
34	Brunei Darussalam	BRN	1.4	0.4	89.3
35	Israel	ISR	1.3	0.4	89.7
36	Finland	FIN	1.2	0.3	90.0
37	Norway	NOR	1.0	0.3	90.3
38	Austria	AUT	0.9	0.3	90.6
	The World		336.0	100.0	

Source: Authors' calculations based on the UN COMTRADE database

Appendix B: Count-based Japanese Manufactured Import Variety by Source Countries

No.	Country	Code	1983	1988	1994	2005
1	United Arab Emirates	ARE	14	41	65	123
2	Australia	AUS	256	355	385	393
3	Austria	AUT	284	347	358	381
4	Brazil	BRA	192	255	256	293
5	Brunei Darussalam	BRN	3	4	16	14
6	Canada	CAN	328	379	393	410
7	Switzerland	CHE	394	415	414	404
8	Chile	CHL	22	36	54	66
9	China	CHN	298	428	469	508
10	Denmark	DNK	292	328	339	343
11	Spain	ESP	249	331	364	382
12	Finland	FIN	183	249	273	299
13	France	FRA	456	480	481	477
14	United Kingdom	GBR	476	490	491	482
15	Germany	GER	602	643	501	500
16	China, Hong Kong SAR	HKG	276	364	366	341
17	Indonesia	IDN	108	227	341	410
18	India	IND	163	220	294	366
19	Ireland	IRL	172	205	215	247
20	Iran	IRN	12	27	57	69
21	Israel	ISR	111	146	215	271
22	Italy	ITA	426	447	456	465
23	Rep. of Korea	KOR	397	467	475	495
24	Kuwait	KWT	10	14	17	17
25	Mexico	MEX	136	210	241	310
26	Malaysia	MYS	154	244	331	376
27	Netherlands	NLD	352	387	416	424
28	Norway	NOR	195	204	225	246
29	New Zealand	NZL	132	175	230	264
30	Oman	OMN	3	7	10	16
31	Philippines	PHL	165	191	291	356
32	Russian Federation	RUS	144	159	162	209
33	Saudi Arabia	SAU	31	48	50	59
34	Singapore	SGP	252	337	386	368
35	Sweden	SWE	355	375	375	371
36	Thailand	THA	152	300	380	428
37	USA	USA	516	518	518	517
38	Viet Nam	VNM	13	38	120	324

Appendix C: Feenstra's Measure of Product Variety Over Time (1)

No.	Country	Code	1983	1984	1985	1986	1987
1	USA	USA	0.00004	-0.00015	-0.00001	-0.00002	0.00013
2	China	CHN	0.00137	-0.00374	-0.00026	0.00436	0.01402
3	Rep. of Korea	KOR	0.00035	0.00027	0.00128	0.00140	0.00388
4	Australia	AUS	0.01174	-0.00271	-0.02030	0.01390	0.03868
5	Indonesia	IDN	0.00498	-0.00108	0.00524	0.00570	0.01302
6	Germany	GER	0.00144	0.00193	-0.00129	0.00046	0.00040
7	Canada	CAN	0.00710	0.02726	-0.00697	-0.01812	0.03481
8	Malaysia	MYS	0.00032	-0.00499	0.03927	0.01428	-0.00106
9	United Arab Emirates	ARE	0.00095	0.00038	0.01252	0.00882	-0.01912
10	Thailand	THA	0.00290	-0.00614	0.01482	0.00713	0.00447
11	Saudi Arabia	SAU	5.75949	-0.08116	0.70127	0.02294	0.03027
12	United Kingdom	GBR	-0.00026	0.00327	-0.00920	0.00019	-0.00053
13	Singapore	SGP	0.00460	0.05045	-0.10083	0.00476	0.00127
14	France	FRA	0.00020	-0.12767	0.00259	0.01825	-0.00589
15	Italy	ITA	0.00214	0.00296	-0.00013	0.00313	0.00345
16	Russian Federation	RUS	0.01266	-0.00504	0.01048	-0.00025	0.00466
17	Switzerland	CHE	-0.00116	0.00264	-0.00015	-0.00002	-0.00014
18	Brazil	BRA	0.00751	-0.00403	0.00174	-0.00081	-0.00273
19	Philippines	PHL	0.02838	-0.01414	0.01074	0.00110	-0.03215
20	Chile	CHL	0.03588	-0.02812	-0.00697	0.01401	-0.00557
21	India	IND	-0.00937	-0.01498	0.02382	-0.02296	0.00303
22	Iran	IRN	0.01550	-0.02991	0.01263	-0.00522	0.02814
23	Kuwait	KWT	-0.06436	-0.02572	1.28398	-0.24964	-0.03118
24	China, Hong Kong SAR	HKG	-0.00036	0.00241	0.00125	0.00273	0.00074
25	Sweden	SWE	0.00697	0.00345	-0.00756	-0.00288	-0.00614
26	New Zealand	NZL	0.00517	0.08192	-0.00044	0.00850	0.00172
27	Netherlands	NLD	0.01971	-0.01350	0.00099	0.00026	0.00107
28	Ireland	IRL	-0.01819	0.00045	0.01594	0.01310	-0.00106
29	Denmark	DNK	0.00134	-0.00098	-0.00084	0.00405	0.00344
30	Oman	OMN	0.00357	NA	0.00147	-0.00390	0.00946
31	Viet Nam	VNM	-0.16184	0.41162	0.03423	0.29927	0.12210
32	Spain	ESP	-0.02161	-0.00216	0.00267	0.01012	0.00622
33	Mexico	MEX	0.14577	-0.02321	-0.03820	0.01164	0.09346
34	Brunei Darussalam	BRN	NA	NA	0.07715	NA	-3.69233
35	Israel	ISR	0.00485	-0.00063	0.00546	-0.00214	0.00314
36	Finland	FIN	-0.00804	0.00508	0.00643	0.03671	-0.00110
37	Norway	NOR	0.00837	0.00474	0.01363	0.00443	-0.00461
38	Austria	AUT	0.00417	0.08822	-0.06221	-0.01730	0.00197

Source: Authors' calulations based on the UN COMTRADE database

Appendix C: Feenstra's Measure of Product Variety Over Time (2)

No.	Country	Code	1988	1989	1990	1991	1992	1993
1	USA	USA	-0.00060	-0.00001	0.00000	0.00009	-0.00009	0.00000
2	China	CHN	-0.00084	0.00012	0.00103	0.00030	-0.00013	-0.00014
3	Rep. of Korea	KOR	-0.00108	0.00002	0.00007	0.00082	-0.00052	-0.00011
4	Australia	AUS	-0.04166	-0.00912	0.00599	0.00017	0.00169	-0.00294
5	Indonesia	IDN	0.01308	0.00384	0.00078	0.00878	0.00114	-0.00450
6	Germany	GER	-0.00007	-0.00127	0.00003	-0.00015	-0.00038	0.00069
7	Canada	CAN	-0.00147	-0.00936	0.00578	-0.00293	0.00100	-0.00385
8	Malaysia	MYS	0.03503	0.00091	0.00153	0.00302	0.00009	0.00007
9	United Arab Emirates	ARE	0.00144	0.00353	0.00291	-0.00472	-0.00051	0.00055
10	Thailand	THA	-0.01452	0.00432	0.00185	0.00175	-0.00134	0.00003
11	Saudi Arabia	SAU	-0.03945	-0.00020	0.00220	0.03323	-0.02057	-0.01630
12	United Kingdom	GBR	-0.00006	0.00045	-0.00084	0.00213	0.00048	-0.00033
13	Singapore	SGP	0.00261	0.00177	0.00134	-0.00062	-0.00157	-0.00102
14	France	FRA	0.01600	0.00051	0.00365	-0.00184	0.00486	-0.00461
15	Italy	ITA	-0.00256	0.00081	-0.00050	0.00034	-0.00252	-0.00020
16	Russian Federation	RUS	0.00348	0.00065	-0.00040	0.00515	0.00847	-0.00281
17	Switzerland	CHE	0.00008	-0.00033	-0.00048	0.00015	0.00001	0.00055
18	Brazil	BRA	-0.00208	0.00267	0.00401	-0.00915	-0.00799	-0.00456
19	Philippines	PHL	0.02543	-0.00023	0.00045	0.03986	0.00562	-0.00284
20	Chile	CHL	0.02531	0.00434	-0.00247	0.00326	-0.00100	-0.03388
21	India	IND	0.00245	0.05452	-0.00143	0.00163	0.00112	0.01437
22	Iran	IRN	0.03730	-0.00449	-0.10152	0.00762	0.00860	0.37515
23	Kuwait	KWT	3.94260	0.27659	-1.46444	-3.78334	NA	0.75513
24	China, Hong Kong SAR	HKG	0.00015	0.00201	0.00222	0.00032	-0.00105	-0.00041
25	Sweden	SWE	-0.02657	-0.00130	-0.00353	0.00352	0.01876	-0.00179
26	New Zealand	NZL	0.01413	-0.01082	0.00018	-0.00109	0.00086	-0.00076
27	Netherlands	NLD	-0.02639	0.00806	0.01660	-0.01174	0.01437	-0.01525
28	Ireland	IRL	0.01501	0.00795	-0.04307	-0.01164	0.00137	0.00128
29	Denmark	DNK	-0.00427	-0.00422	0.00430	-0.00133	-0.00074	0.00186
30	Oman	OMN	-0.00113	NA	NA	0.00589	-3.43440	NA
31	Viet Nam	VNM	-0.09007	0.26421	0.01586	-0.00837	0.00517	0.02535
32	Spain	ESP	-0.01150	-0.04221	0.02404	-0.00596	-0.00575	0.11044
33	Mexico	MEX	0.02248	0.00308	-0.00545	-0.04409	-0.05400	-0.02693
34	Brunei Darussalam	BRN	NA	3.38697	2.59751	-0.55761	-1.53903	1.27653
35	Israel	ISR	0.01350	0.00200	-0.00508	0.01118	-0.01220	-0.02028
36	Finland	FIN	0.02861	-0.00333	0.00812	0.00063	0.02081	-0.00747
37	Norway	NOR	0.03075	-0.01288	0.00593	-0.00035	-0.01125	-0.00015
38	Austria	AUT	0.00868	-0.00207	0.00542	-0.00265	0.00184	-0.00249

Source: Authors' calulations based on the UN COMTRADE database

Appendix C: Feenstra's Measure of Product Variety Over Time (3)

No.	Country	Code	1994	1995	1996	1997	1998	1999
1	USA	USA	0.00001	-0.00002	-0.00006	-0.00002	-0.00007	-0.00004
2	China	CHN	0.00009	0.00120	0.00015	0.00009	-0.00007	0.00003
3	Rep. of Korea	KOR	0.00028	0.00001	0.00022	0.00001	0.00043	-0.00078
4	Australia	AUS	-0.00799	-0.00841	0.00941	-0.00654	-0.00032	0.00254
5	Indonesia	IDN	0.00436	0.00161	-0.00059	-0.00029	0.00754	0.00027
6	Germany	GER	-0.00115	-0.00036	-0.00007	0.00068	-0.00012	0.00225
7	Canada	CAN	0.00100	0.00061	0.00638	-0.00033	-0.01074	0.00819
8	Malaysia	MYS	0.00042	0.00052	-0.00001	0.00072	-0.00067	-0.00037
9	United Arab Emirates	ARE	0.00761	0.00153	0.00280	-0.00147	0.00447	-0.00140
10	Thailand	THA	0.00032	0.00031	0.00038	0.00029	-0.00032	0.00032
11	Saudi Arabia	SAU	0.00026	0.01076	-0.01331	0.01501	-0.00426	-0.04124
12	United Kingdom	GBR	0.00004	-0.00044	0.00037	0.00023	-0.00263	-0.00103
13	Singapore	SGP	0.00076	0.00069	-0.00006	-0.00014	0.00026	-0.00021
14	France	FRA	0.00010	0.00028	0.00106	0.00030	-0.00043	-0.00133
15	Italy	ITA	0.00507	0.00172	-0.00143	-0.00185	0.00150	-0.00003
16	Russian Federation	RUS	-0.00223	0.00062	-0.00036	-0.00046	-0.00761	0.00475
17	Switzerland	CHE	0.00063	0.00105	-0.00264	0.00029	-0.00043	-0.00008
18	Brazil	BRA	0.00827	0.00312	0.00520	-0.00531	-0.00096	-0.00151
19	Philippines	PHL	0.00301	-0.00300	0.00050	0.00066	0.00176	-0.00248
20	Chile	CHL	-0.00509	0.00217	0.01321	0.03187	0.00494	0.01558
21	India	IND	-0.00332	-0.00660	0.00183	0.00699	-0.01273	-0.00098
22	Iran	IRN	-0.18801	0.17963	0.01702	-0.06848	0.02510	-0.00498
23	Kuwait	KWT	-0.11876	-1.51206	0.92584	0.45251	3.02675	0.89589
24	China, Hong Kong SAR	HKG	-0.00007	0.00020	0.00003	0.00138	-0.00289	0.00086
25	Sweden	SWE	0.00024	-0.00069	0.00056	0.00009	0.04142	-0.00110
26	New Zealand	NZL	0.00206	-0.00020	-0.00003	0.00016	0.00057	0.00161
27	Netherlands	NLD	0.00438	0.01439	-0.01103	-0.00045	-0.00057	-0.00069
28	Ireland	IRL	-0.00426	-0.00310	0.00207	0.00058	-0.00018	-0.00038
29	Denmark	DNK	0.00079	0.00123	0.00010	0.00770	0.00015	-0.00118
30	Oman	OMN	-0.00075	0.01999	0.01528	0.00615	0.00205	0.11099
31	Viet Nam	VNM	0.00803	0.00643	0.00784	0.00472	0.00363	0.00441
32	Spain	ESP	0.00772	-0.01520	0.00624	0.00233	-0.00091	-0.00857
33	Mexico	MEX	-0.00215	0.04469	0.01452	-0.05449	0.00803	-0.01680
34	Brunei Darussalam	BRN	-0.77858	-0.17606	1.19726	-0.28193	-0.72454	0.78298
35	Israel	ISR	0.00138	0.00230	-0.01780	0.00041	0.00209	0.00006
36	Finland	FIN	0.09702	-0.00390	0.00002	-0.00142	0.00493	-0.00277
37	Norway	NOR	0.00197	0.00318	0.00152	0.00523	0.00840	-0.00730
38	Austria	AUT	0.00484	-0.00044	0.00506	-0.00165	0.00368	-0.00412

Source: Authors' calulations based on the UN COMTRADE database

Appendix C: Feenstra's Measure of Product Variety Over Time (4)

No.	Country	Code	2000	2001	2002	2003	2004	2005
1	USA	USA	0.00000	0.00000	-0.00001	0.00001	0.00000	0.00000
2	China	CHN	-0.00001	0.00001	-0.00001	0.00000	0.00007	0.00001
3	Rep. of Korea	KOR	0.00010	0.00002	0.00000	0.00081	-0.00005	-0.00026
4	Australia	AUS	-0.00135	0.00425	-0.00468	-0.00153	-0.00014	0.02088
5	Indonesia	IDN	0.00050	0.00093	-0.00081	-0.00123	-0.00117	0.00063
6	Germany	GER	-0.00058	0.00074	0.00030	-0.00125	-0.00002	0.00208
7	Canada	CAN	0.00496	-0.00966	0.02380	0.00000	-0.05389	0.02798
8	Malaysia	MYS	-0.00004	-0.00006	-0.00015	0.00016	0.00006	-0.00047
9	United Arab Emirates	ARE	-0.00142	0.01823	0.00265	0.07146	-0.07012	0.00102
10	Thailand	THA	0.00116	0.00033	0.00061	-0.00030	0.00072	0.00000
11	Saudi Arabia	SAU	0.00340	-0.00110	-0.00732	0.00253	-0.02237	0.00379
12	United Kingdom	GBR	-0.00763	0.00095	-0.00069	-0.00762	0.00045	0.00418
13	Singapore	SGP	0.00027	-0.00047	0.00002	0.00345	-0.00016	-0.00690
14	France	FRA	-0.00047	-0.04880	0.06275	0.00004	-0.02724	0.00854
15	Italy	ITA	-0.00054	0.00107	0.00011	-0.00164	-0.00085	-0.00024
16	Russian Federation	RUS	0.00418	0.00174	-0.00333	0.01237	0.00602	0.00303
17	Switzerland	CHE	-0.00014	0.00143	-0.00592	-0.00144	-0.00002	-0.00047
18	Brazil	BRA	0.02281	-0.00110	-0.00509	0.00602	-0.00599	0.00202
19	Philippines	PHL	0.00207	-0.00098	-0.00006	0.00001	0.00014	0.00002
20	Chile	CHL	-0.00756	-0.00360	-0.13758	0.21859	0.00547	-0.01018
21	India	IND	0.00696	0.00066	-0.00124	0.00702	0.00214	-0.00024
22	Iran	IRN	0.04564	0.18136	-0.26413	-0.07986	0.31456	-0.00129
23	Kuwait	KWT	-0.59612	-1.38161	-0.04535	2.46940	-0.15026	0.05489
24	China, Hong Kong SAR	HKG	0.00062	0.00056	0.00157	0.00084	0.00014	-0.00016
25	Sweden	SWE	-0.01018	0.00043	-0.00010	-0.00129	0.00137	-0.00041
26	New Zealand	NZL	-0.00008	0.00058	-0.00042	0.00006	0.00011	0.00140
27	Netherlands	NLD	0.00148	-0.00035	0.01104	-0.00680	0.00268	-0.00079
28	Ireland	IRL	-0.00016	0.00494	0.00016	-0.00012	-0.00074	0.00018
29	Denmark	DNK	0.00131	0.00534	-0.00104	0.00024	-0.00037	-0.00004
30	Oman	OMN	0.01539	-0.65428	-0.36076	-0.07325	0.07107	1.98787
31	Viet Nam	VNM	0.00167	-0.00144	0.00031	0.00251	0.00127	-0.00044
32	Spain	ESP	0.00110	0.00474	-0.00166	0.00194	0.00693	0.00010
33	Mexico	MEX	0.00190	-0.00245	0.01176	-0.00873	0.02420	-0.00008
34	Brunei Darussalam	BRN	-0.30298	-1.47068	0.15796	-0.02405	-0.04875	0.02182
35	Israel	ISR	0.00076	0.00000	-0.00660	0.00383	-0.00116	0.00573
36	Finland	FIN	-0.00101	0.00451	-0.00286	0.00358	-0.00363	0.00719
37	Norway	NOR	-0.00805	-0.00016	0.00168	0.01372	-0.00752	0.00106
38	Austria	AUT	-0.00248	0.04802	-0.00105	0.00062	-0.00488	-0.00363

Source: Authors' calculations based on the UN COMTRADE database

Appendix D: Japanese Manufactured Imports from US in 1983

No.	CODE	Description	Value
1	S2-5111	Acyclic hydrocarbons	2639597
2	S2-5112	Cyclic hydrocarbons	1.05E+08
3	S2-5113	Halogenated derivatives of hydrocarbons	1.02E+08
4	S2-5114	Hydrocarbons derivatives, nonhaloganeted	3592346
5	S2-5121	Acyclic alcohols, and their derivatives	83404776
6	S2-5122	Cyclic alcohols, and their derivatives	517917
7	S2-5123	Phenols and phenol-alcohols, and their derivatives	57427252
8	S2-5137	Monocarboxylic acids and their derivatives	49011008
9	S2-5138	Polycarboxylic acids and their derivatives	21848366
10	S2-5139	Oxygen-function acids, and their derivatives	6152087
11	S2-5145	Amine-function compounds	16289315
12	S2-5146	Oxygen-function amino-compounds	17707266
13	S2-5147	Amide-function compounds; excluding urea	16985428
14	S2-5148	Other nitrogen-function compounds	97757184
15	S2-5154	Organo-sulphur compounds	42989024
16	S2-5155	Other organo-inorganic compounds	15008942
17	S2-5156	Heterocyclic compound; nucleic acids	62064176
18	S2-5157	Sulphonamides, sultones and sultams	3980861
19	S2-5161	Ethers, epoxides, acetals	37131032
20	S2-5162	Aldehyde, ketone and quinone-function compounds	17249930
…	……	…………………………………………………………………	……..
499	S2-8951	Office and stationary supplies, of base metal	116767
500	S2-8952	Pens, pencils and, fountain pens	8653217
501	S2-8959	Other office and stationary supplies	4255705
502	S2-8960	Works of art, collectors' pieces and antiques	29674362
503	S2-8972	Imitation jewellery	8723203
504	S2-8973	Precious jewellery, goldsmiths' or silversmiths' wares	8708846
505	S2-8974	Other articles of precious metals or rolled precious metals, nes	1156705
506	S2-8981	Pianos, other string musical instruments	1328699
507	S2-8982	Musical instruments, nes	7987060
508	S2-8983	Sound recording tape, discs	97142448
509	S2-8989	Parts, nes of and accessories for musical instruments; metronomes	5733559
510	S2-8991	Articles and manufacture of carving, moulding materials, nes	127171
511	S2-8993	Candles, matches, combustible products, etc	4610949
512	S2-8994	Umbrellas, canes and similar articles and parts thereof	185121
513	S2-8996	Orthopaedic appliances, hearing aids, artificial parts of the body	42203504
514	S2-8997	Basketwork, wickerwork; brooms, paint rollers, etc	4456718
515	S2-8998	Small-wares and toilet articles, nes; sieves; tailors' dummies, etc	1445273
516	S2-8999	Manufactured goods, nes	1501306
		Total	**986767120**

Appendix E: Japanese Manufactured Imports from US in 1984

No.	CODE	Description	Value
1	S2-5111	Acyclic hydrocarbons	2569026
2	S2-5112	Cyclic hydrocarbons	8.80E+07
3	S2-5113	Halogenated derivatives of hydrocarbons	1.10E+08
4	S2-5114	Hydrocarbons derivatives, nonhaloganeted	4839035
5	S2-5121	Acyclic alcohols, and their derivatives	103000000
6	S2-5122	Cyclic alcohols, and their derivatives	448624
7	S2-5123	Phenols and phenol-alcohols, and their derivatives	71705240
8	S2-5137	Monocarboxylic acids and their derivatives	49163424
9	S2-5138	Polycarboxylic acids and their derivatives	22680524
10	S2-5139	Oxygen-function acids, and their derivatives	8785285
11	S2-5145	Amine-function compounds	20176688
12	S2-5146	Oxygen-function amino-compounds	17135316
13	S2-5147	Amide-function compounds; excluding urea	17705864
14	S2-5148	Other nitrogen-function compounds	86174496
15	S2-5154	Organo-sulphur compounds	48092152
16	S2-5155	Other organo-inorganic compounds	16255829
17	S2-5156	Heterocyclic compound; nucleic acids	61818732
18	S2-5157	Sulphonamides, sultones and sultams	3597834
19	S2-5161	Ethers, epoxides, acetals	38502488
20	S2-5162	Aldehyde, ketone and quinone-function compounds	12587428
…	……	………………………………………………………………	……..
500	S2-8959	Other office and stationary supplies	4520405
501	S2-8960	Works of art, collectors' pieces and antiques	41340500
502	S2-8972	Imitation jewellery	8922369
503	S2-8973	Precious jewellery, goldsmiths' or silversmiths' wares	7134595
504	S2-8974	Other articles of precious metals or rolled precious metals, nes	1985554
505	S2-8981	Pianos, other string musical instruments	1310699
506	S2-8982	Musical instruments, nes	6549342
507	S2-8983	Sound recording tape, discs	103000000
508	S2-8989	Parts, nes of and accessories for musical instruments; metronomes	5743354
509	S2-8991	Articles and manufacture of carving, moulding materials, nes	101467
510	S2-8993	Candles, matches, combustible products, etc	5031949
511	S2-8994	Umbrellas, canes and similar articles and parts thereof	50353
512	S2-8996	Orthopaedic appliances, hearing aids, artificial parts of the body	53148200
513	S2-8997	Basketwork, wickerwork; brooms, paint rollers, etc	5185167
514	S2-8998	Small-wares and toilet articles, nes; sieves; tailors' dummies, etc	1655036
515	S2-8999	Manufactured goods, nes	1213924
		Total	**1030147611**

Appendix F: Japanese Manufactured Goods Imported from US in both 1983 and 1984

No.	Code	Description	Value	
			1983	1984
1	S2-5111	Acyclic hydrocarbons	2639597	2569026
2	S2-5112	Cyclic hydrocarbons	1.05E+08	88016712
3	S2-5113	Halogenated derivatives of hydrocarbons	1.02E+08	1.10E+08
4	S2-5114	Hydrocarbons derivatives, nonhaloganeted	3592346	4839035
5	S2-5121	Acyclic alcohols, and their derivatives	83404776	1.03E+08
6	S2-5122	Cyclic alcohols, and their derivatives	517917	448624
7	S2-5123	Phenols and phenol-alcohols, and their derivatives	57427252	71705240
8	S2-5137	Monocarboxylic acids and their derivatives	49011008	49163424
9	S2-5138	Polycarboxylic acids and their derivatives	21848366	22680524
10	S2-5139	Oxygen-function acids, and their derivatives	6152087	8785285
11	S2-5145	Amine-function compounds	16289315	20176688
12	S2-5146	Oxygen-function amino-compounds	17707266	17135316
13	S2-5147	Amide-function compounds; excluding urea	16985428	17705864
14	S2-5148	Other nitrogen-function compounds	97757184	86174496
15	S2-5154	Organo-sulphur compounds	42989024	48092152
16	S2-5155	Other organo-inorganic compounds	15008942	16255829
17	S2-5156	Heterocyclic compound; nucleic acids	62064176	61818732
18	S2-5157	Sulphonamides, sultones and sultams	3980861	3597834
19	S2-5161	Ethers, epoxides, acetals	37131032	38502488
20	S2-5162	Aldehyde, ketone and quinone-function compounds	17249930	12587428
…	……	…………………………………………………	……..	……..
498	S2-8960	Works of art, collectors' pieces and antiques	29674362	41340500
499	S2-8972	Imitation jewellery	8723203	8922369
500	S2-8973	Precious jewellery, goldsmiths' or silversmiths' wares	8708846	7134595
501	S2-8974	Other articles of precious metals or rolled precious metals	1156705	1985554
502	S2-8981	Pianos, other string musical instruments	1328699	1310699
503	S2-8982	Musical instruments, nes	7987060	6549342
504	S2-8983	Sound recording tape, discs	97142448	1.03E+08
505	S2-8989	Parts, nes of and accessories for musical instruments;…	5733559	5743354
506	S2-8991	Articles and manufacture of carving, moulding materials	127171	101467
507	S2-8993	Candles, matches, combustible products, etc	4610949	5031949
508	S2-8994	Umbrellas, canes and similar articles and parts thereof	185121	50353
509	S2-8996	Orthopaedic appliances, hearing aids, artificial patrs…	42203504	53148200
510	S2-8997	Basketwork, wickerwork; brooms, paint rollers, etc	4456718	5185167
511	S2-8998	Small-wares and toilet articles, nes; sieves;	1445273	1655036
512	S2-8999	Manufactured goods, nes	1501306	1213924
		Total	**973741431**	**1025627206**

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