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FORECASTING SHIFTS IN THE WORLD TRADE OF CHEMICALS

by

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INTRODUCTION

Is it possible to develop a model which reliably predicts commodity imports and exports of a country? This question will be examined with respect to the world trade of chemicals. After an analysis of the chemical trade flows among groups of nations at different stages of economic development an attempt is made to model the flow of specific groups of chemicals an a country by country basis.

Scope and Limitations of Study

The commodity of interest was chemicals, as defined by Standard International Trade Classification (SITC)[1] group five. The first part of the project examined the trade flows of chemicals between market economies (ME's) and their subgroups, developed market economies (DdME's) and developing market economies (DgME's). This part was limited to market economies only because of the difficulty of obtaining trade information for nonmarket economies; furthermore, it examined only the aggregate trade flows of all chemicals. No attempt was made to examine subgroups of chemicals in this part of the project. Trade flows were examined in terms of both current and absolute dollars in order, to isolate the influence of inflation in the share and distribution of chemical trade flows. The time horizon under observation was the years 1960 to 1976; more recent information could not be obtained from the available secondary sources.

The second part of the project attempted to develop models to predict a country's imports and exports of subgroups of chemicals on the basis of the economic variables of this country. One model was developed for imports and

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[1]"Commodity Indexes for the Standard International Trade Classification, Revised," Statistical Papers Series M, Vol. 1, No. 38 (New York: United Nations, 1963).

exports of each of the sixteen subgroups of chemicals listed in Table 1. These groups of chemicals were the dependent variables in cross-sectional regression analyses in which countries constituted the cases. The twelve economic and demographic variables listed in Table 2 were selected as candidate predictor variables. In addition, interaction between some variables was suspected, and therefore four interaction terms were included. They are listed in Table 3. The predictor variables were lagged two years in order to increase the practical relevance of the models. A two-year lag was chosen because only predictors lagged two years or more would be available in time to use the model before the year for which the prediction is made. Lack of more current information for some variables made it necessary to use 1975 data for the dependent and 1973 data for the independent variables. Analysis was performed using the stepwise regression routine, with the option of backward regression, of the MIDAS statistical package of The University of Michigan. Minimum acceptable significance levels for all variables were selected .05 for the F-test and .10 for the t-test.

Data

Time and resource constraints made it necessary to use data from available secondary sources. All data about trade of chemicals, the time series of the first part of the project, and the information about exports and imports of countries by 3-digit SITC code were obtained from the Yearbook of International Trade Statistics,[2] published by the U.N. The predictor variables (GNP per

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[2]Yearbook of International Trade Statistics 1977, Vols. I and II, New York: United Nations, 1978).

capita, gross domestic investment, percentage of gross domestic product [GDP] generated in manufacturing and services, energy consumption, value added per worker, and total labor force) were obtained from World Tables,[3] a World Bank publication. GDP (absolute and per capita) and national income (absolute and per capita) were obtained from the Statistical Yearbook,[4] a U.N. publication. Finally, the population data were obtained from the Demographic Yearbook,[5] also a U.N. publication. For the cross sectional study the sample included all of the countries (usually forty) for which imports and exports on a 3-digit SITC level were listed in volume 2 of the Yearbook of International Trade Statistics;[6] but because of incomplete data for some of the countries, the actual used sample size ranged from about twenty-five to thirty-six cases. It should be kept in mind that these samples are by no means random samples and therefore could be biased; however, time and resource constraints, as well as lack of data (especially for less developed countries), prohibited either the use of proper random sampling procedures or a census of all countries. More recent and complete data can be obtained from the U.N., World Bank, and OECD for a fee.

Hypotheses

It was expected that chemicals as a group did not change their share of international trade and that developed or developing countries neither

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[3]World Tables 1976 (Washington, D.C.: International Bank for Reconstruction and Development/World Bank, 1976.

[4]Statistical Yearbook (New York: United Nations, 1979 and earlier years).

[5]Demographic Yearbook (New York: United Nations, 1979 and earlier years).

[6]Yearbook of International Trade Statistics 1977, Vols. 1 and 2 (New York: United Nations, 1978).

improved nor worsened their position as sources or receivers in the overall trade of chemicals between market economies.

H_1: Chemicals retained a constant share of all trade between market economies and between developed and developing market economies between 1960 and 1976, regardless of whether trade is measured in constant or current dollars.

H_2: The percentage distribution of chemical trade flows between market economies and between developed and developing market economies remained constant between 1960 and 1976, regardless of whether this distribution is based on constant or current dollars.

In the next part of the project, exports and imports of 3-digit SITC subgroups of chemicals were examined on a country-by-country basis. It was expected that a country's exports and imports of chemicals could be predicted by the economic variables listed in Tables 2 and 3 and the lagged dependent variable.

H_3: The variability of a country's imports and exports of subgroups of chemicals on a 3-digit SITC level can be explained with better than 90 percent confidence by this country's economic and demographic variables (listed in Tables 2 and 3) and the lagged dependent variable.

Results

Magnitude and Direction of All Trade of Chemicals

The first analysis examined the constancy of the share of chemicals in all trade flows between market economies. The time series analyses and the results of the trend line analyses are shown in Tables 4 and 5, and the time series are plotted in Figures 1 and 2. Table 4 and Figure 1 are based on current dollars, while Table 5 and Figure 2 are based on constant dollars (1970 = 100). On the basis of current dollars, only the change over time in trade

flows from ME's to DgME's and from DdME's to DgME's are not significantly different from zero; all other shares are significant at better than the .05 level. On the basis of constant dollars, only the slope of the trade flow from DdME's to DgME's is not significant at the .05 level (but is significant at the .10 level); all other slopes are significant at better than the .05 level. This means that the hypothesis of no change over the sixteen years under observation can be accepted only for trade flows from ME's and DdME's to DgME's if the analysis is based on current dollars. In all other cases H_1 has to be rejected. Looking at the slope coefficients, though, it becomes clear that the change over time was very slight. On the basis of current dollars, the strongest average yearly change occurred for trade flows from DdME's to DdME's, but amounted to only 0.14075% percent. A comparison of the slopes of the time series based on constant and current dollars shows constantly steeper average yearly increases if the analysis is based on constant dollars; but in this case the strongest average increase amounts to only 0.22689 percent per year for the trade flow from DgME's to DgME's. This leads to the conclusion that, for the time span under observation, trade of chemicals suffered slightly less from inflation than did all trade between market economies.

The next step was the analysis of changes in distribution of all chemical trade among ME's, DdME's, and DgME's. The time series and results are shown in Tables 6 and 7 and the time series are plotted in Figures 3 and 4. Table 6 and Figure 3 are based on current dollars and Table 7 and Figure 4 on constant dollars. As could be expected, DdME's are the major participants in world trade of chemicals. When the analysis was based on current dollars, the only cases in which changes over time were not significantly different from zero where those of DgME's exports to DdME's and DgME's. When the analysis was based on constant dollars, only changes in exports from ME's to DgME's were

not significantly different from zero. For all other time series, changes were significant at better than the .05 level. Therefore H_2 has to be rejected in all cases except those specified above.

In Tables 6 and 7, columns 1/2, 3/4, 5/6, and 7/8 have to sum to 100 for every year. Therefore, the slope coefficient of one column of each pair has to be positive while the other one has to be negative by exactly the same amount. In neither Table 6 nor Table 7 do the slopes of each pair have exactly the same absolute value; differences tend to be larger in Table 7 than in Table 6. This is because of errors in recording international trade which occur frequently, especially in developing countries. In Table 7, another source of error is the price index used to arrive at constant dollar terms. Because of problems in obtaining complete and correct information, price indices for international trade are at best close approximations.

Cross-Sectional Study of Imports and Exports of Subgroups of Chemicals by Country

Part two of the project was concerned with the exports and imports of subgroups of chemicals by country. The groups of chemicals of interest and the variables chosen as candidate predictor variables were already introduced above (Tables 1 to 3). The analysis will be explained, for the example of imports of organic chemicals (SITC 512); the results for the other groups will then be summarized.

Complete data for the analysis of imports of organic chemicals could be obtained for N = thirty-four countries. Stepwise regression identified four highly significant models with high explanatory power.

Model 1

This model results from a stepwise regression analysis in which all variables listed in Tables 2 and 3 in their original and logarithmic forms were

candidate predictors. Out of these, twenty variables were retained, some in their original and logarithmic forms, pointing to higher order nonlinear relationships. This model is shown in Table 8.

Model 2

This model differs from model 1 only in that, in addition to the variables in model 1, the dependent variable lagged by two years was included in its original and logarithmic forms. This model retained twenty-two variables, among them the lagged dependent variable in both forms. The model is shown in Table 9.

Model 3

Given a total of only thirty-four valid cases, the number of retained variables in models 1 and 2 is very large. However, it was expected that a model including variables only in their original form would not lose much explanatory power. Model 3 includes all variables from Tables 2 and 3 as candidate predictor variables. A look at Table 10 confirms that, despite the fact that model 3 retains only eleven predictor variables (as compared with twenty and twenty-two in models 1 and 2, respectively), the loss of explanatory power is very slight.

Model 4

This model differs from model 3 only in, that the dependent variable lagged by two years was included as a candidate predictor. This change, as can be seen in Table 11, not only increased the explanatory power of model 4 vis-a-vis model 3, but also reduced the number of predictor variables to only five.

Model Selection

The choice among the models listed above has to be model 4. Not only does this model have the second lowest standard error (36,620), but it also has the lowest number of predictor variables, all of which are intuitively appealing. Even the negative coefficients of variables 4 (GDP) and 17 (value added per worker x total labor force) make sense intuitively. High GDP and value added could indicate higher and more capital-intensive domestic production, thus implying a reduced need to import such capital-intensive goods as chemicals. Some variables have coefficients which differ in sign across the four models, pointing to a high degree of multicollinearity and possible interaction among variables. All variables of model 4 show consistency in the sign of their coefficients in all models where they are included. The large number of variables, as well as coefficients which are not always intuitively appealing, make models 1 and 2 least appealing among the four models.

In the same way, imports and exports of all subgroups of chemicals under observation were analyzed. Tables 12 and 13 show the results obtained by stepwise regression for imports and exports, respectively. The dependent variable lagged by two years was included as a candidate predictor variable, but logarithmic terms were excluded. Table 12 shows that more than 90 percent of the variability in a country's imports of chemicals for all groups except 561 and 571 could be accounted for. The import model of group 571 proved to be the only model which did not include the lagged dependent variable as predictor variable and for which H_3 did not hold. In the case of group 561, the model in Table 12 also accounted for less than 90 percent of the variation in imports; however, as can be seen in Table 14, an analysis which did not include the lagged dependent variable as candidate predictor performed slightly better and accounted for more than 90 percent of the variation in imports of this

group of chemicals. This case was also the only one in which the inclusion of the lagged dependent variable as predictor did not produce the best model.

Table 13 shows that in all cases, more than 90 percent of the variability in a country's exports of chemicals could be accounted for; in all but two cases, the figure was better than 99 percent. A comparison of Tables 12 and 13 shows that in all cases except that of group 513, more variability in exports than in imports can be accounted for. Comparisons of Tables 12 with 14 and 13 with 15, respectively, show that the inclusion of the lagged dependent variable is in general more important for the export than for the import models.

The models of exports and imports differ widely, with respect to both the variables they include and the magnitude and signs of their coefficients. This was expected because of the heterogeneity of the subgroups of chemicals. Some groups, like 561 (fertilizers), will be more important to the trade of less industrialized countries, while others, like 581 (plastic materials), will be more important to the trade of industrialized countries. The models for these groups will thus require either different economic indicators as predictors, or different coefficients for the same indicators.

Summary

The major purpose of this article is the development of models predicting the exports and imports of chemicals by country. The question to be answered was: Is it possible to account for a large part of the variability of a country's exports or imports of chemicals with easily accessible economic and demographic indicators and the lagged dependent variable? On the basis of this study, this question has to be answered with yes. In all but one case it was possible to develop a model accounting for more than 90 percent of a country's exports or imports. The project suffered considerably from lack of

data; out of a potential sample of 106 cases, only 25 to 36 could be used in any analysis because of missing data. One possibility for future research would be to repeat the study with a larger, more complete database in order to verify the results of this exploratory project. Another possibility would be to repeat this study for other groups of commodities, in order to determine whether similar results can be obtained for commodities other than chemicals.

References

1) Business Week, January 14, 1980, pp. 54-58.

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3) Standard Industrial Classification Manual 1972. Washington, D.C.: Executive Office of the President, Office of Management and Budget, 1977.

4) Commodity Indexes for the Standard International Trade Classification, Revised, Statistical Papers Series M, No. 38, Vol. 1. New York: United Nations, 1963.

5) Standard & Poor's industry surveys, Chemicals, Basic Analysis, 1979 and earlier years.

6) Statistical Abstracts of the United States 1978. Washington, D.C.: U.S. Department of Commerce, Bureau of the Census, 1979.

7) Yearbook of International Trade Statistics 1977, Vols. 1 and 2, New York: United Nations, 1978.

8) 1977 World Trade Annual, Vol. II. New York: Walker and Company, 1979.

9) The Chemical Industry 1977. Paris: Organization for Economic Co-Operation and Development, 1979.

10) Concentration Ratios in Manufacturing, 1972 Census of Manufactures, Special Report Series. Washington, D.C.: U.S. Deparment of Commerce, Bureau of the Census, 1973.

11) World Tables 1976. Washington, D.C.: International Bank for Reconstruction and Development/World Bank, 1976.

12) Statistical Yearbook. New York: United Nations, 1979 and earlier years.

13) Demographic Yearbook. New York: United Nations, 1979 and earlier years.

Table 1: Groups of Chemicals Under Investigation

SITC	Section 5. Chemicals
512	Organic chemicals
513	Inorganic chemicals: elements, oxides and halogen salts
514	Other inorganic chemicals
515	Radioactive and associated materials
521	Mineral tar and crude chemicals from coal, petroleum and natural gas
531	Synthetic organic dyestuffs, natural indigo and colour lakes
532	Dyeing and tanning extracts, and synthetic tanning materials
533	Pigments, paints, varnishes and related materials
541	Medicinal and pharmaceutical products
551	Essential oils, perfume and flavour materials
553	Perfumery and cosmetics, dentifrices and other toilet preparations (excepts soaps)
554	Soaps, cleansing and polishing preparations
561	Fertilizers, manufactured
571	Explosives and pyrotechnic products
581	Plastic materials, regenerated cellulose and artificial resins
599	Chemical materials and products, n.e.c.*

*n.e.c. = not elsewhere classified.

Source: Commodity Indexes for the Standard International Trade Classification, Revised, Statistical Papers Series M, No. 38, Vol. 1. New York: United Nations, 1963.

Table 2: Candidate Predictor Variables

Variable	Variable Number Original	Logarithm
Gross National Product (GNP) per capita in U.S. dollars	V3	V21
Gross Domestic Product (GDP) in millions of U.S. dollars	V4	V22
Gross Domestic Product per capita in U.S. dollars	V5	V23
Gross Domestic Investment in percent of GDP	V6	V24
Percent of GDP generated in manufacturing	V7	V25
Percent of GDP generated in services	V8	V26
Energy Consumption in million metric tons of coal equivalent	V9	V27
Value added per worker in U.S. dollars*	V10	V28
Total labor force in thousands**	V11	V29
National Income in millions of U.S. dollars	V12	V30
National Income per capita in U.S. dollars	V13	V31
Population in millions	V14	V32

*In 1972 U.S. dollars

**Figures from 1970

Table 3: Interaction Terms

Variable	Variable Number Original	Logarithm
Gross National Product per capita x population	V15	V33
Percent of GDP generated in manufacturing x percent of GDP generated in services	V16	V34
Value added per worker x total labor force	V17	V35
Energy Consumption/Population	V18	V36

Table 4: Chemicals As Percent of All Trade

Year	1	2	3	4	5	6	7	8	9
1960	6.01	7.57	1.08	5.44	6.95	0.86	7.63	9.27	1.80
1963	6.24	7.73	1.19	5.63	7.07	0.79	8.27	9.93	2.54
1964	6.53	8.00	1.33	5.90	7.37	0.76	8.68	10.24	3.29
1965	6.68	8.14	1.39	6.06	7.48	0.88	8.86	10.47	3.15
1966	6.90	8.33	1.46	6.21	7.60	0.96	9.36	10.95	3.40
1967	7.07	8.53	1.52	6.40	7.83	0.92	9.55	11.11	3.71
1968	7.26	8.74	1.48	6.60	8.12	0.90	9.74	11.32	3.65
1969	7.25	8.63	1.64	6.67	8.05	0.92	9.55	10.94	4.30
1970	7.13	8.45	1.69	6.57	7.87	1.05	9.39	10.83	4.06
1971	7.06	8.35	1.70	6.51	7.78	1.05	9.21	10.65	4.00
1972	7.12	8.39	1.85	6.56	7.81	1.14	9.44	10.89	4.38
1973	7.25	8.70	1.82	6.74	8.18	1.12	9.39	10.93	4.30
1974	7.75	10.32	1.65	7.27	9.85	1.13	9.44	11.98	3.44
1975	7.15	9.11	1.80	6.74	8.77	1.21	8.35	10.09	3.41
1976	7.05	9.26	1.46	6.88	9.25	0.91	7.58	9.33	3.14
Slope Coefficient	.075503	.11369	.039440	.094613	.14075	.021995	.025423	.04164	.087541
t-Statistic	5.0284	4.8635	5.0745	8.3402	5.8126	4.2862	.62220	1.0116	2.6493
Significance	.0002	.0003	.0002	.0000	.0001	.0009	.5446	.3302	.0200

1. From ME's to ME's.
2. From DdME's to ME's.
3. From DgME's to ME's.
4. From ME's to DdME's.
5. From DdME's to DdME's.
6. From DgME's to DdME's.
7. From ME's to DgME's.
8. From DdME's to DgME's.
9. From DgME's to DgME's.

urce: Yearbook of International Trade Statistics 1977, Vols. 1 and 2, New York: United Nations, 1978.

Table 5: Chemicals As Percent of All Tradein Prices of 1970

Year	1	2	3	4	5	6	7	8	9
1960	4.78	5.83	1.32	4.31	5.34	1.14	6.26	7.47	1.93
1963	5.39	6.62	1.40	4.87	5.98	1.00	7.39	8.78	2.70
1964	5.83	7.05	1.59	5.20	6.43	0.98	7.93	9.23	3.45
1965	5.91	7.20	1.53	5.47	6.67	1.01	7.87	9.28	3.18
1966	6.36	7.60	1.52	5.72	6.99	1.02	8.55	10.03	3.30
1967	6.71	8.10	1.52	6.07	7.43	0.96	9.09	10.55	3.48
1968	6.81	8.28	1.53	6.13	7.45	0.93	9.52	10.95	3.58
1969	6.88	8.19	1.68	6.39	7.64	0.95	9.16	10.28	4.31
1970	7.13	8.45	1.69	6.57	7.87	1.05	9.39	10.83	4.06
1971	7.41	8.68	1.85	6.77	8.09	1.16	9.66	11.05	4.27
1972	7.64	9.01	2.07	6.99	8.32	1.30	8.83	12.01	4.70
1973	7.79	9.16	2.01	7.30	8.67	1.23	9.82	8.91	4.75
1974	7.83	9.07	3.02	7.45	8.73	2.14	9.08	10.20	5.75
1975	7.39	8.45	3.36	7.04	8.17	2.37	8.50	9.46	5.73
1976	7.73	8.98	2.74	7.43	8.73	1.76	8.73	9.75	5.40
Slope Coefficient	.19156	.19555	.11049	.20195	.21307	.066895	.14158	.11268	.22689
t-Statistic	12.194	9.2068	5.4599	18.333	13.950	3.4852	3.5131	1.9422	14.053
Significance	.0000	.0000	.0001	.0000	.0000	.0040	.0038	.0741	.0000

1. From ME's to ME's.
2. From DdME's to ME's.
3. From DgME's to ME's.
4. From ME's to DdME's.
5. From DdME's to DdME's.
6. From DgME's to DdME's.
7. From ME's to DgME's.
8. From DdME's to DgME's.
9. From DgME's to DgME's.

ource: Yearbook of International Trade Statistics 1977, Vols. 1 and 2, New York: United Nations, 1978.

Table 6: Percent Distribution of Chemical Trade FlowsBetween Market Economies

Year	1	2	3	4	5	6	7	8
1960	95.68	4.32	67.13	32.87	67.42	32.58	60.71	39.29
1963	95.65	4.35	69.44	30.56	70.26	29.74	51.43	48.57
1964	95.44	4.56	69.99	30.01	71.22	28.78	44.19	55.81
1965	95.51	4.49	70.65	29.35	71.67	28.33	48.94	51.06
1966	95.43	4.57	70.28	29.72	71.25	28.75	50.00	50.00
1967	95.52	4.48	71.17	28.83	72.29	27.71	47.37	52.63
1968	95.84	4.16	71.76	28.24	72.81	27.19	47.54	52.46
1969	95.53	4.47	73.35	26.65	74.72	25.28	44.00	56.00
1970	95.37	4.63	73.78	26.22	74.93	25.07	48.86	51.14
1971	95.34	4.66	73.66	26.34	73.91	25.09	47.96	53.06
1972	94.87	5.09	74.17	25.83	75.59	24.41	47.66	52.34
1973	94.70	5.30	74.47	25.53	75.99	24.01	47.34	52.66
1974	93.70	6.30	72.88	27.12	74.20	25.80	53.24	46.76
1975	93.24	6.76	70.16	29.61	71.64	28.36	50.14	47.18
1976	94.12	5.88	73.85	26.12	75.53	24.47	47.43	52.29
Slope Coefficient	-.13173	.13133	.34987	-.35508	.40599	-.41283	.28726	.23510
t-Statistic	-4.6635	4.6357	4.2776	-4.4858	4.8423	-4.8221	-1.2982	1.0049
Significance	.0004	.0005	.0009	.0006	.0003	.0003	.2168	.3333

1. Percent of all ME's exports accounted for by DdMe's.
2. Percent of all ME's exports accounted for by DgME's.
3. Percent of all ME's imports accounted for by DdME's.
4. Percent of all ME's imports accounted for by DgME's.
5. Percent of all DdME's exports absorbed by DdME's.
6. Percent of all DdME's exports absorbed by DgME's.
7. Percent of all DgME's exports absorbed by DdME's.
8. Percent of all DgME's exports absorbed by DgME's.

ource: Yearbook of International Trade Statistics 1977, Vols. 1 and 2,
New York: United Nations, 1978.

Table 7: Percent Distribution of Chemical Trade Flows Between Market Economies

(based on prices of 1970)

Year	1	2	3	4	5	6	7	8
1960	94.82	6.22	67.70	32.82	67.94	32.60	66.67	33.33
1963	94.63	5.75	69.44	30.56	70.27	29.73	55.56	42.22
1964	95.35	5.84	69.95	29.73	71.20	28.46	48.15	48.15
1965	95.53	5.47	72.07	28.53	73.05	27.47	50.91	45.45
1966	95.42	5.09	70.98	28.84	71.95	27.96	50.85	45.76
1967	95.54	4.62	71.90	27.71	73.01	26.59	50.00	48.33
1968	94.83	4.32	71.05	28.81	72.86	28.04	48.48	50.00
1969	95.56	4.62	73.35	26.94	74.68	25.57	44.30	54.43
1970	95.37	4.63	73.78	26.22	74.93	25.07	48.86	51.14
1971	95.34	4.80	73.67	26.09	74.92	24.77	48.48	50.51
1972	94.84	5.29	74.17	26.09	75.62	24.65	48.78	50.41
1973	94.67	5.03	75.59	24.60	77.17	22.99	47.37	53.38
1974	94.18	7.24	74.76	25.20	76.12	23.76	53.66	45.85
1975	93.22	8.43	71.91	28.13	73.42	26.71	51.40	45.33
1976	94.12	6.61	73.85	26.12	75.53	24.47	47.74	50.75
Slope Coefficient	-.077312	.077228	.38814	-.39794	.45280	-.46518	-.59280	.67028
t-Statistic	-2.3582	1.2229	5.5945	-5.8408	6.3844	-6.2183	-2.3264	2.7885
Significance	.0347	.2431	.0001	.0001	.0000	.0000	.0368	.0154

1. Percent of all ME's exports accounted for by DdMe's.
2. Percent of all ME's exports accounted for by DgME's.
3. Percent of all ME's imports accounted for by DdME's.
4. Percent of all ME's imports accounted for by DgME's.
5. Percent of all DdME's exports absorbed by DdME's.
6. Percent of all DdME's exports absorbed by DgME's.
7. Percent of all DgME's exports absorbed by DdME's.
8. Percent of all DgME's exports absorbed by DgME's.

Source: Yearbook of International Trade Statistics 1977, Vols. 1 and 2, New York: United Nations, 1978.

Table 8: Selection of Regression (model #1)
Analysis at Step 11 for 37.V37 N = 34 out of 46

Source	DF	Sum of Sqrs	Mean Square	F-Stat	Signif
Regression	19	.45689+13	.24047+12	146.44	.0000
Error	14	.22989+11	.16421+10		
Total	33	.45919+13			

Multiple R = .99749 R-Sqr = .99499 SE = 40523.

Variable	Partial	Coefficient	Std Error	T-Stat	Signif
Constant		-.67585 +7	.20549 +7	-3.2889	.0054
3.V3	.96155	1008.3	76.966	13.100	.0000
4.V4	-.62640	-28.513	9.4829	-3.0067	.0094
5.V5	-.95963	-893.55	69.993	-12.766	.0000
6.V6	-.73396	-43981.	10877.	-4.0434	.0012
7.V7	-.89692	-96366.	12698.	-7.5893	.0000
8.V8	-.88002	-.11277 +6	16265.	-6.9329	.0000
12.V12	.91004	81.943	9.9757	8.2143	.0000
14.V14	-.91081	-1289.7	156.23	-8.2549	.0000
15.V15	-.92770	-39.326	4.2294	-9.2981	.0000
16.V16	.91575	1674.5	196.34	8.5287	.0000
17.V17	-.71663	-.56404 -2	.14671 -2	-3.8446	.0018
18.V18	.84680	64507.	10829	5.9568	.0000
21.V21	-.94631	-.82815 +6	75608.	-10.953	.0000
24.V24	.79114	.11639 +7	.24049 +6	4.8398	.0003
25.V25	-.68665	-.22195 +7	.62804 +6	-3.5341	.0033
29.V29	-.92172	-.59822 +6	67280.	-8.8916	.0000
30.V30	-.69654	-.42900 +6	.11811 +6	-3.6323	.0027
33.V33	.91441	.11533 +7	.13645 +6	8.4522	.0000
34.V34	.77872	.29285 +7	.63056 +6	4.6443	.0004

Remaining	Partial	Signif
9.V9	.02246	.9367
10.V10	-.07075	.8022
11.V11	.43112	.1086
13.V13	-.26042	.3486
22.V22	-.09481	.7368
23.V23	.05547	.8444
26.V26	-.00000	1.0000
27.V27	.05500	.8457
28.V28	-.16573	.5550
31.V31	.29321	.2889
32.V32	.00000	1.0000

Regression of 37.V37 using backward selection

Step	R-Sqr	Std Error	# Var	Variable		Partial	Signif
0	.99742	62814.	30		In		
1	.99742	54398.	29	26.V26	Out	-.00000	1.0000
2	.99742	48655.	28	32.V32	Out	-.00000	1.0000
3	.99742	44453.	27	9.V9	Out	.04085	.9307
4	.99727	42350.	26	22.V22	Out	.23583	.5739
5	.99721	40002.	25	11.V11	Out	.13886	.7216
6	.99687	39948.	24	23.V23	Out	-.32965	.3523
7	.99660	39499.	23	10.V10	Out	-.28188	.4010
8	.99643	38593.	22	28.V28	Out	.21848	.4951
9	.99618	38241.	21	27.V27	Out	-.25765	.3954
10	.99542	40204.	20	13.V13	Out	-.40601	.1497
11	.99499	40523.	19	31.V31	Out	.29321	.2889

Table 9: Selection of Regression (Model #2)
Analysis at Step 9 for 37.V37 N = 34 out of 46

Source	DF	Sum of Sqrs	Mean Square	F-Stat	Signif
Regression	23	.45896+13	.19955+12	861.08	.0000
Error	10	.23174+10	.23174 +9		
Total	33	.45919+13			

Multiple R = .99975 R-Sqr = .99950 SE = 15223.

Variable	Partial	Coefficient	Std Error	T-Stat	Signif
Constant		.12187 +8	.17853 +7	6.8260	.0000
38.V38	.96597	1.1514	.97491 -1	11.811	.0000
4.V4	-.93685	-53.564	6.3231	-8.4712	.0000
6.V6	.89178	38515.	6179.6	6.2326	.0001
7.V7	.64240	10321.	3893.5	2.6508	.0243
8.V8	.86248	54131.	10044.	5.3892	.0003
9.V9	-.66756	-801.06	282.54	-2.8352	.0177
10.V10	.80829	33.296	7.6698	4.3412	.0015
12.V12	.91619	53.532	7.4046	7.2295	.0000
14.V14	-.77169	-341.03	88.880	-3.8370	.0033
15.V15	.92411	13.074	1.7096	7.6475	.0000
16.V16	-.75826	-335.64	91.257	-3.6780	.0043
17.V17	-.91929	-.60191 -2	.81493 -3	-7.3861	.0000
18.V18	-.61355	-26486.	10780.	-2.4570	.0338
21.V21	.83233	.33643 +7	.70848 +6	4.7486	.0008
24.V24	-.90165	-.10048 +7	.15240 +6	-6.5929	.0001
26.V26	-.87114	-.23943 +7	.42678 +6	-5.6102	.0002
27.V27	.90696	.29221 +6	42915.	6.8089	.0000
28.V28	-.85746	-.27272 +6	51752.	-5.2698	.0004
29.V29	-.80529	-.23142 +6	53878.	-4.2952	.0016
30.V30	.81963	.29837 +7	.65949 +6	4.5243	.0011
31.V31	-.83406	-.32975 +7	.68971 +6	-4.7809	.0007
33.V33	-.82385	-.31932 +7	.69473 +6	-4.5963	.0010
40.V40	.89297	.13882 +6	22128.	6.2734	.0001

Remaining	Partial	Signif
3.V3	-.09442	.7824
5.V5	-.11565	.7349
11.V11	.09910	.7719
13.V13	-.04549	.8943
22.V22	-.27359	.4156
23.V23	-.26523	.4306
25.V25	.07161	.8343
32.V32	.00001	1.0000
34.V34	.07161	.8343

Regression of 37.V37 using backward selection

Step	R-Sqr	Std Error	# Var	Variable		Partial	Signif
0	.99968	38310.	32		In		
1	.99968	27090.	31	25.V25	Out	.00000	1.0000
2	.99968	22119.	30	32.V32	Out	.00001	1.0000
3	.99968	19174.	29	34.V34	Out	-.04465	.9432
4	.99968	17168.	28	23.V23	Out	-.04570	.9315
5	.99967	15822.	27	3.V3	Out	-.13750	.7688
6	.99965	15221.	26	22.V22	Out	.27173	.5150
7	.99960	15128.	25	11.V11	Out	.33789	.3738
8	.99950	15939.	24	13.V13	Out	.44636	.1960
9	.99950	15223.	23	5.V5	Out	-.11565	.7349

Table 10: Selection of Regression (Model #3)

Analysis at Step 5 for 37.V37 N = 34 out of 46

Source	DF	Sum of Sqrs	Mean Square	F-Stat	Signif
Regression	11	.42958+13	.39053+12	29.019	.0000
Error	22	.29607+12	.13458+11		
Total	33	.45919+13			

Multiple R = .96722 R-Sqr = .93552 SE = .11601 +6

Variable	Partial	Coefficient	Std Error	T-Stat	Signif
Constant		.18536 +7	.45637 +6	4.0617	.0005
3.V3	.60661	475.25	132.79	3.5790	.0017
4.V4	-.83785	-103.82	14.422	-7.1987	.0000
7.V7	-.56913	-64347.	19820.	-3.2465	.0037
8.V8	-.66291	-43291.	10424.	-4.1529	.0004
9.V9	-.56308	-2483.6	777.15	-3.1959	.0042
11.V11	-.67554	-3.4859	.81115	-4.2974	.0003
12.V12	.84643	131.32	17.613	7.4555	.0000
13.V13	-.70664	-617.21	131.76	-4.6842	.0001
16.V16	.56230	1468.0	460.28	3.1894	.0042
17.V17	-.49394	-.91935 -2	.34503 -2	-2.6645	.0142
18.V18	.63901	.11708 +6	30047.	3.8965	.0008

Remaining	Partial	Signif
5.V5	.10511	.6331
6.V6	-.20266	.3537
10.V10	.23782	.2745
14.V14	.11350	.6061
15.V15	-.28095	.1941

Regression of 37.V37 using backward selection

Step	R-Sqr	Std Error	# Var	Variable		Partial	Signif
0	.94645	.12027 +6	16		In		
1	.94640	.11693 +6	15	5.V5	Out	-.03069	.9007
2	.94606	.11417 +6	14	14.V14	Out	.07896	.7407
3	.94477	.11261 +6	13	10.V10	Out	.15301	.5079
4	.94061	.11396 +6	12	6.V6	Out	-.26462	.2340
5	.93552	.11601 +6	11	15.V15	Out	-.28095	.1941

Table 11: Selection of Regression (Model #4)

Analysis at Step 12 for 37.V37 N = 34 out of 46

Source	DF	Sum of Sqrs	Mean Square	F-Stat	Signif
Regression	5	.45543+13	.91087+12	679.25	.0000
Error	28	.37548+11	.13410+10		
Total	33	.45919+13			

Multiple R = .99590 R-Sqr = .99182 SE = 36620.

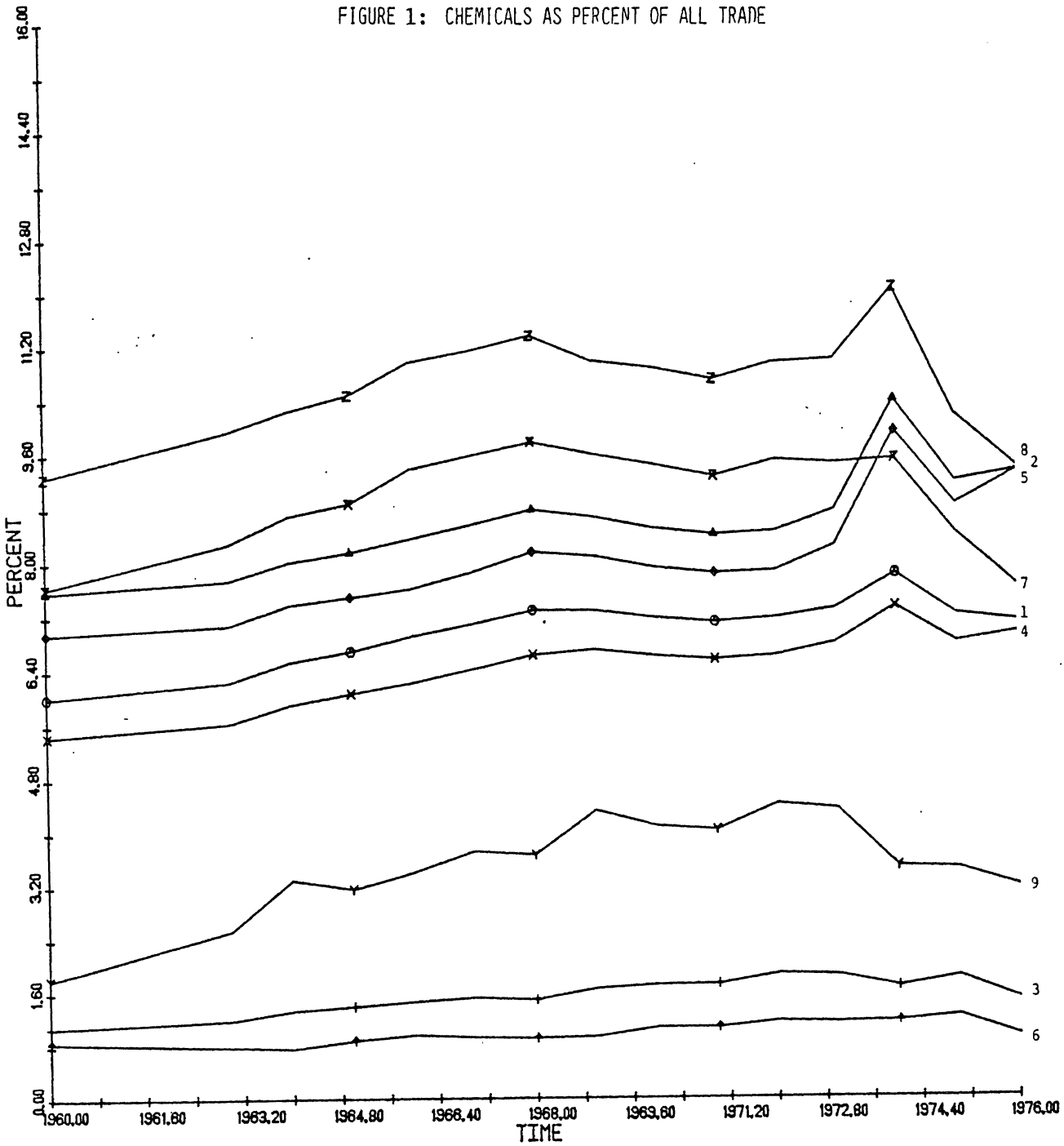
Variable	Partial	Coefficient	Std Error	T-Stat	Signif
Constant		8998.6	8628.0	1.0429	.3059
4.V4	-.63057	-8.9100	2.0726	-4.2991	.0002
9.V9	.55087	800.21	229.12	3.4926	.0016
15.V15	.65405	10.905	2.3835	4.5752	.0001
17.V17	-.60682	-.38720 -2	.95846 -3	-4.0398	.0004
38.V38	.99010	1.6971	.45458 -1	37.333	.0000

Remaining	Partial	Signif
3.V3	-.17769	.3564
5.V5	-.17799	.3556
6.V6	-.31086	.1007
7.V7	-.12126	.5309
8.V8	-.34795	.0644
10.V10	-.17012	.3776
11.V11	.23996	.2099
12.V12	.13755	.4768
13.V13	-.18133	.3465
14.V14	.26021	.1728
16.V16	-.30480	.1079
18.V18	-.18417	.3389

Regression of 37.V37 using backward selection

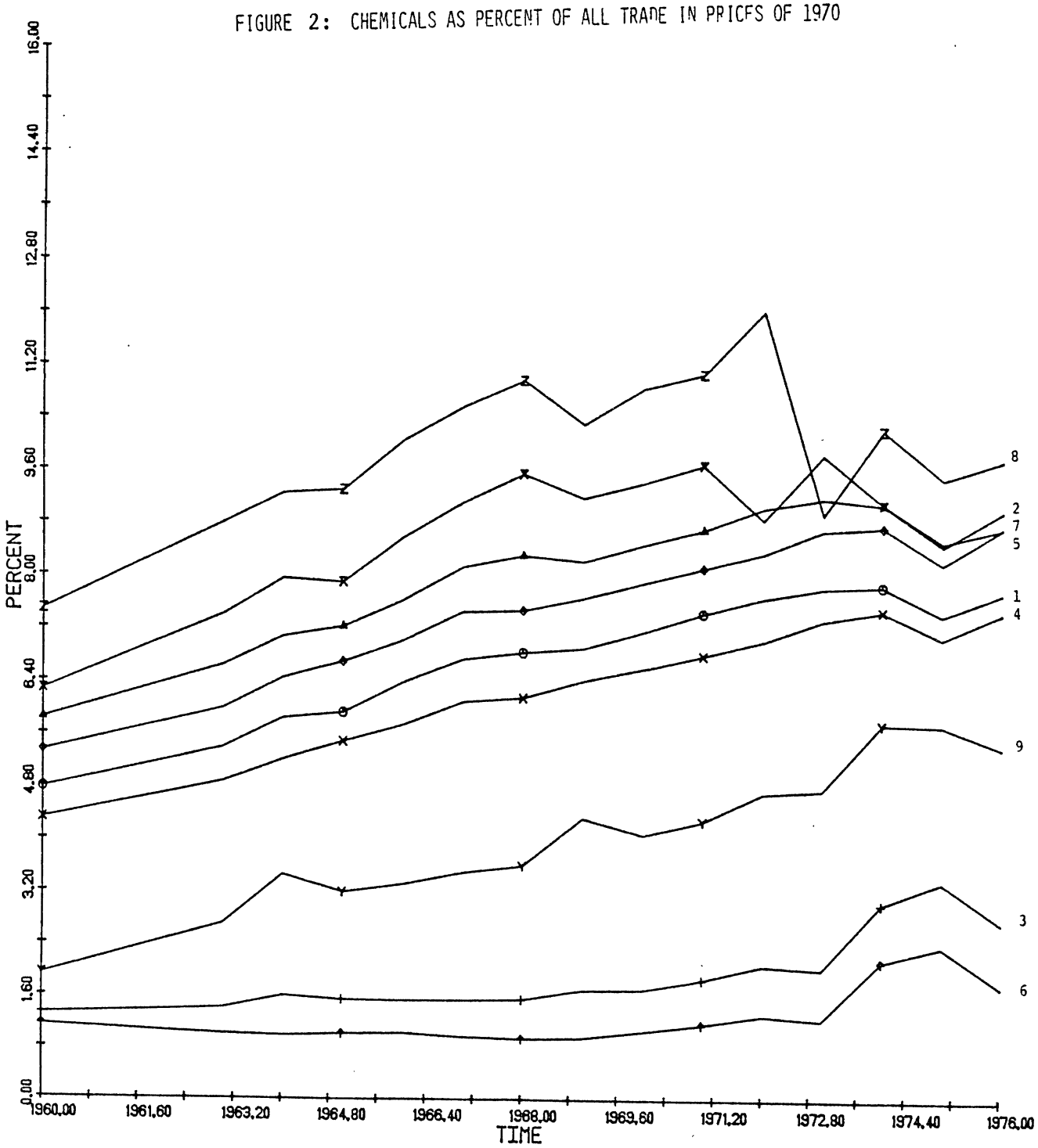
Step	R-Sqr	Std Error	# Var	Variable		Partial	Signif
0	.99484	38492.	17		In		
1	.99484	37344.	16	12.V12	Out	.00798	.9749
2	.99483	36309.	15	18.V18	Out	-.03096	.8999
3	.99481	35431.	14	3.V3	Out	-.07113	.7657
4	.99478	34610.	13	13.V13	Out	-.06651	.7745
5	.99477	33812.	12	5.V5	Out	.04633	.8378
6	.99465	33406.	11	11.V11	Out	-.14866	.4984
7	.99438	33501.	10	14.V14	Out	.22113	.2991
8	.99419	33340.	9	8.V8	Out	.18000	.3892
9	.99361	34255.	8	6.V6	Out	-.30094	.1352
10	.99320	34643.	7	10.V10	Out	.24477	.2185
11	.99258	35517.	6	7.V7	Out	.28955	.1350
12	.99182	36620.	5	16.V16	Out	-.30480	.1079

FIGURE 1: CHEMICALS AS PERCENT OF ALL TRADE



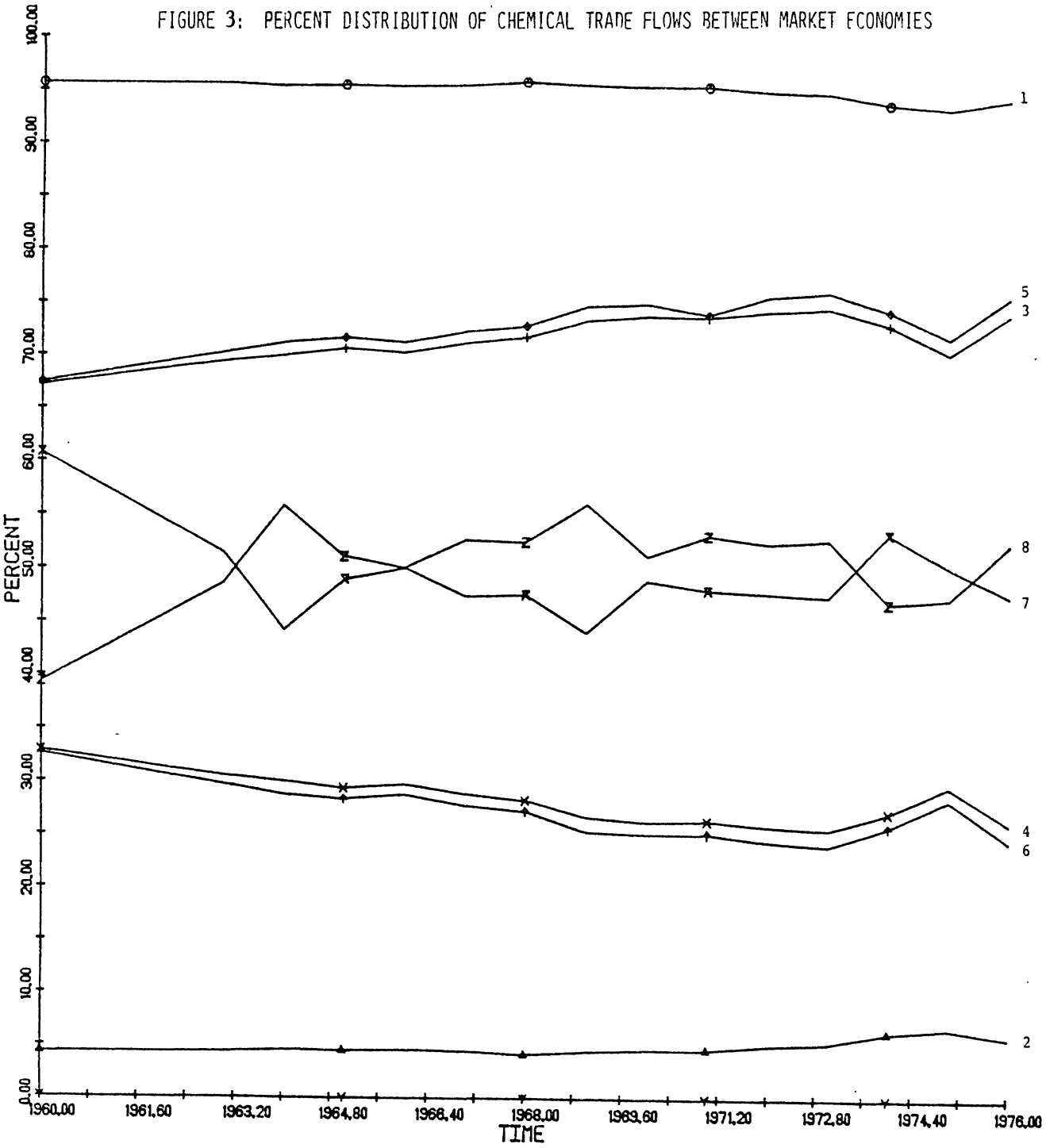
1. From ME's to ME's
2. From DdME's to ME's
3. From DgME's to ME's
4. From ME;s to DdME's
5. From DdME's to DdME's
6. From DgME's to DdME's
7. From ME's to DgME's
8. From DdME's to DgME's
9. From DgME's to DgME's

FIGURE 2: CHEMICALS AS PERCENT OF ALL TRADE IN PRICES OF 1970



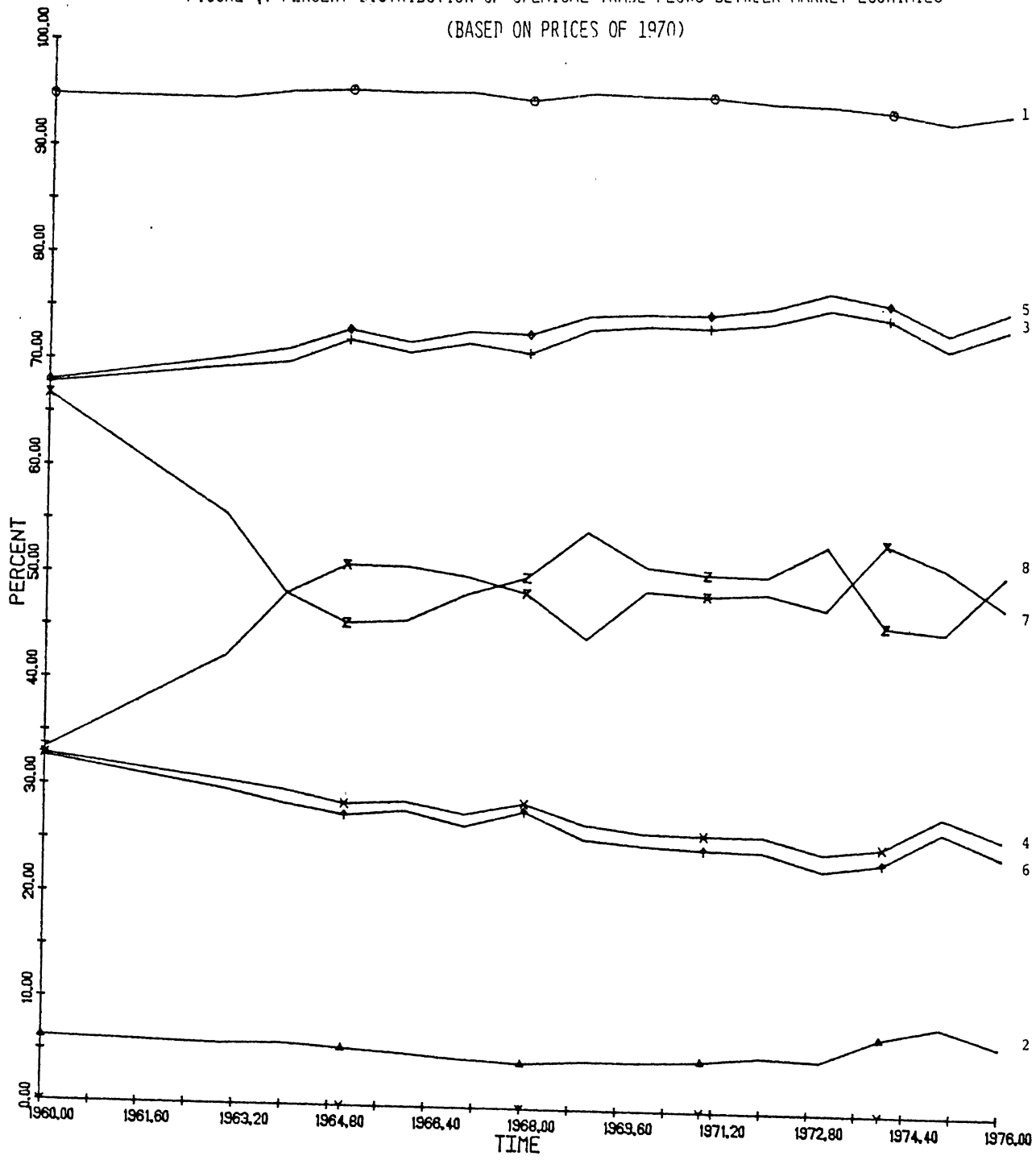
1. From ME's to ME's
2. From DdME's to ME's
3. From DgME's to ME's
4. From ME's to DdME's
5. From DdME's to DdME's
6. From DgME's to DdME's
7. From ME's to DgME's
8. From DdME's to DgME's
9. From DgME's to DgME's

FIGURE 3: PERCENT DISTRIBUTION OF CHEMICAL TRADE FLOWS BETWEEN MARKET ECONOMIES



1. Percent of all ME's exports accounted for by DdMe's
2. Percent of all ME's exports accounted for by DgME's
3. Percent of all ME's imports accounted for by DdME's
4. Percent of all ME's imports accounted for by DgME's
5. Percent of all DdME's exports absorbed by DdME's
6. Percent of all DdME's exports absorbed by DgME's
7. Percent of all DgME's exports absorbed by DdME's
8. Percent of all DgME's exports absorbed by DgME's

FIGURE 4: PERCENT DISTRIBUTION OF CHEMICAL TRADE FLOWS BETWEER MARKET ECONIMIES
(BASED ON PRICES OF 1970)



1. Percent of all ME's exports accounted for by DdMe's
2. Percent of all ME's exports accounted for by DgME's
3. Percent of all ME's imports accounted for by DdME's
4. Percent of all ME's imports accounted for by DgME's
5. Percent of all DdME's exports absorbed by DdME's
6. Percent of all DdME's exports absorbed by DgME's
7. Percent of all DgME's exports absorbed by DdME's
8. Percent of all DgME's exports absorbed by DgME's

Table 12: Models of Imports of Chemicals including the Lagged Dependent Variable as Predictor

Dependent Variable (SITC)	Coefficients						
	V3	V4	V5	V6	V7	V8	V9
512		-9.6070		-2281.8	4702.7		736.27
513		-4.3273			-3626.3		420.88
514	20.992	-2.0866					
515	95.822	-9.2789				-1489.7	
521						-385.00	
531	34.189			-581.56		-694.25	
532		-.00244					
533	6.6754				-430.78		
541	95.530		-85.173			-1221.2	588.72
551	18.027					-197.83	-28.881
553	9.5076	-.96021		-300.80	-1014.0	-597.51	
554	18.910		-12.935			-343.40	-50.298
561							
571		-3.2749	40.202				-133.99
581	162.95	-15.477				-3010.5	
599	45.997	-9.0516		-1697.3	-1073.2	-1235.5	-377.27

Table 12--Continued

Dependent Variable (SITC)	Coefficients						
	V10	V11	V12	V13	V14	V15	V16
512	6.1530					11.726	125.43
513			5.6090				91.266
514			2.3054	-23.396			
515	-9.5149		15.660	101.52		-4.8799	
521	4.3597				77.423		
531			1.6174	-33.779	114.59	-1.4631	
532				-.22725			
533	-4.4905	-.47035					
541		-.29970	5.1493			-3.3695	-31.178
551	-1.8385		1.2011	-19.615		-1.0157	
553			1.4378	-12.901	-61.932		29.008
554	-3.4319	-.94569	.12336		265.25		
561		-6.1144			3359.7		
571	-3.0610	-.97927	2.9723	-43.383	278.54	.89800	
581		-7.8901	19.278	-147.80	2234.1		-70.140
599		-.31062	10.879	-59.616			

Table 12--Continued

Dependent Variable (SITC)	Coefficients V17	Coefficients V18	Lagged Dependent Variable	Constant	F-Statistic (Significance)	R^2	Standard Error
512	-0.0039		1.7135	63497	450.90 (.0000)	.99412	33539.
513	-0.0015	-7098.1	1.2224	21262	166.12 (.0000)	.98299	20708
514			1.3225	13168	63.348 (.0000)	.92956	11852
515		15047	2.4053	55082	26.199 (.0000)	.91822	21775
521		-5557.6	1.9592	13983	155.28 (.0000)	.96880	3577.4
531			.58952	48477	51.144 (.0000)	.94459	7060.3
532			1.5034	376.53	128.54 (.0000)	.93230	1011.3
533	.00004		1.2785	20870	112.90 (.0000)	.96441	7397.4
541	-.0025		1.2722	80487	119.95 (.0000)	.98522	19602
551		3078.5	.70515	11531	210.27 (.0000)	.98954	3023.5
553	-.00036	2200.9	1.0481	29764	158.74 (.0000)	.99374	2710.5
554		2530.8	1.1952	15530	80.868 (.0000)	.97587	5202.5
561			1.0333	14710	67.241 (.0000)	.89367	59668
571		3210.2		7736.3	9.2175 (.0000)	.82171	3699.9
581	-.00185		1.1746	181830	315.49 (.0000)	.99339	27367
599		18982	1.0467	117150	211.80 (.0000)	.99107	16200

Table 13: Models of Exports of Chemicals including the Lagged Dependent Variable as Predictor

Dependent Variable (SITC)	Coefficients						
	V3	V4	V5	V6	V7	V8	V9
512	-121.15	-9.3434		2893.3	-30717	-12853	-861.25
513*	120.81		-123.22				
514*		2.4035			-3456.6	-1338.8	-59.919
515	-47.802	4.8434			-1588.9		-913.71
521	-18.898	-4.3799	11.768	671.87	-1264.5		-249.63
531					-1236.2		-312.79
532*	1.3224	.09137	-1.5992		252.77	164.28	
533	-9.2855	-.46414			-557.99		-116.90
541					-2580.8		-571.14
551*		.95575		-329.79			
553		3.7714			-3162.7	1307.4	
554	12.574		-8.9710		-3920.9	-1733.6	-198.95
561		5.5769		1780.5	-8394.0	-3572.3	-781.48
571					-285.65		-49.177
581		-3.7308			-24673	-11571	-910.36
599		-4.2956				1359.0	-535.92

*Only partial results are shown, further exclusion of variables would lead to near singular matrix.

Table 13--Continued

Dependent Variable (SITC)	Coefficients						
	V10	V11	V12	V13	V14	V15	V16
512		9.1795		92.722	-3582.6	11.011	679.12
513*							
514*		.71016	-2.3235	-6.4933	-257.95		87.377
515			-6.5315	48.816			52.173
521			3.3829			1.7295	14.499
531	-8.3953	1.2999			-497.71	-.68739	34.403
532*		-.06763			27.937	-.08368	-6.0500
533		.06860		8.3172			18.020
541	-10.461					-1.9346	62.566
551*	-4.6521		-1.1293				10.261
553	-2.3979	-1.3630	-3.5815		530.33	-1.0464	73.253
554	-8.2245				-25.184	-.47674	89.181
561	-16.405		-8.9739	20.321			225.50
571	-1.4006		-.26352	2.1858			8.4251
581	-14.746	5.6174			-2246.5	3.9749	573.70
599		3.4051	3.7924		-1331.6		-20.060

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.

Table 13--Continued

Dependent Variable (SITC)	Coefficients V17	Coefficients V18	Lagged Dependent Variable	Constant	F-Statistic (Significance)	R^2	Standard Error
512		16319	1.4918	547280	2810.5 (.0000)	.99964	19068
513*	.00007		1.5430	20964	109.18 (.0000)	.94997	41714
514*	-.00018	3449.4	1.1792	53434	390.48 (.0000)	.99639	7741.3
515	.00249		3.1760	-10551	228.70 (.0000)	.99324	8409.6
521		4826.7	2.2853	862.57	48.309 (.0000)	.97612	3465.0
531	.00139	9707.6	.95089	2728.2	1585.3 (.0000)	.99887	4920.4
532*	-.00001	406.93	1.2409	-7510.9	379.5 (.0000)	.99693	667.99
533	.00073	1932.2	1.2323	-6583.7	1453.0 (.0000)	.99890	4222.9
541	.00329	12350	1.3621	8966.0	960.09 (.0000)	.99727	17900
551*	.00006	5014.8	1.1003	3735.3	261.72 (.0000)	.99101	4175.6
553	.00053	2058.1	1.5069	61007	988.94 (.0000)	.99874	3534.2
554	.00092	7945.2	1.5099	84063	695.51 (.0000)	.99797	4175.7
561	.00465		1.7995	102360	549.18 (.0000)	.99752	16901
571	.00037		1.5743	213.09	354.89 (.0000)	.99231	1683.0
581	.00148	18107	1.2263	515020	1659.7 (.0000)	.99910	22298
599	.00219		1.4435	-43957	2546.7 (.0000)	.99913	12832

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.

Table 14: Models of Imports of Chemicals

Dependent Variable (SITC)	Coefficients						
	V3	V4	V5	V6	V7	V8	V9
512	472.24	-103.63			-64247	-43359	-2500.2
513		-16.622	210.78		-12035	-4196.4	
514	90.815	-10.700			-6460.1	-4066.0	
515*	178.03			-2458.4	883.47		
521	46.377	-2.9618				-698.07	
531	58.840		-63.017			-843.54	-255.95
532	-1.8879						-86.369
533	117.52		-101.26			-1653.5	-479.14
541	404.75	24.005	-598.41				
551	46.202					-426.03	-212.81
553		-12.510			-4325.5	-1916.3	-184.38
554*	43.090		-43.159				-339.62
561		.27224					
571		-3.2347	37.550				-129.14
581	760.20	-36.269		-10492		-15259	-1580.4
599	289.06		-312.01		-11095	-5314.8	-1874.7

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.

Table 14--Continued

Dependent Variable (SITC)	Coefficients						
	V10	V11	V12	V13	V14	V15	V16
512		-3.4872	131.09	-617.56			1469.3
513		-.44041	20.224	-245.07			337.56
514		-3.6096	14.208	-100.98	1085.4		146.26
515*	-16.203	6.5075	10.072	-176.99	-2126.1	-9.5219	
521			5.8566	-47.750		-1.7836	
531			3.7586		244.10	-3.6217	
532						-.08245	
533	-13.087	-4.5369	5.0578		1494.3	-4.7708	
541		-.63175		246.39		-23.903	
551	-6.0145		3.3628	-48.044		-3.1484	
553		-.65897	10.539	-11.132		5.1400	102.21
554*		-2.2888	1.9274		756.13	-1.6231	
561		-13.320		45.091	6389.7		
571	-2.9035	-.90163	2.9432	-40.048	260.90	.87358	
581			78.205	-765.09		-31.045	
599	-21.431	-10.859	17.695		3922.7	-15.565	268.41

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.

Table 14--Continued

Dependent Variable (SITC)	Coefficients V17	Coefficients V18	Constant	F-Statistic (Significance)	R^2	Standard Error
512	-.00915	118950	1854600	29.042 (.0000)	.93557	115960
513	-.00103		164920	56.401 (.0000)	.95846	33086
514	-.00214	9416.4	188320	11.880 (.0000)	.87306	18095
515*	.00062	13563	34414	11.752 (.0000)	.87185	28657
521	-.00053		28294	16.318 (.0000)	.82637	8669.4
531	.00079	9171.4	43830	19.921 (.0000)	.88194	10512
532	.00027	1403.7	2452.6	9.5651 (.0000)	.63916	2401.3
533	-.00125	20550	67402	9.0498 (.0000)	.82579	18074
541			55369	18.221 (.0000)	.82618	60481
551	.00064	8379.4	22454	41.986 (.0000)	.94735	6677.8
553	-.00184	8387.0	89439	27.909 (.0000)	.95937	6634.0
554*	.00057	7902.1	-4250.1	8.2631 (.0000)	.77171	15426
561		-24284	10852	47.607 (.0000)	.90153	57031
571		2796.1	7027.9	8.8674 (.0000)	.80852	3809.4
581		58822	772680	29.791 (.0000)	.92099	91295
599	.00351	77881	216270	24.170 (.0000)	.94016	43518

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.

Table 15: Models of Exports of Chemicals

Dependent Variable (SITC)	Coefficients						
	V3	V4	V5	V6	V7	V8	V9
512	478.06			-26501	-267220	-170760	2503.3
513							
514	166.90				-12066	-7586.5	
515							-563.87
521		-1.6956			-9723.3	-5984.0	
531	261.54			-7746.2	8718.8		
532	10.773	-1.8044			3996.1	1626.1	
533	171.15	-31.132					648.44
541	707.55			-14883	-47603	-35728	
551							-412.62
553	180.51		-157.96		5929.8		-897.21
554	244.11		-232.40				760.14
561*	-75.485	-18.682					-1469.5
571	42.357	-3.7722					
581	428.59			-24516	-228250	-152420	
599	504.98	-75.717		-11845		-11135	

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.

Table 15--Continued

Dependent Variable (SITC)	Coefficients						
	V10	V11	V12	V13	V14	V15	V16
512	149.98		27.322	-732.33	-2354.4		6278.3
513			3.3542				
514			10.354	-190.68	-263.71	-7.5091	269.40
515			3.4218			-5.1129	
521			2.1987	-5.7975	-83.039		218.56
531			17.734	-338.46	-365.14	-11.787	-227.36
532			2.2927	-10.921			-84.932
533		12.910	40.710	-179.64	-5252.6		
541			45.045	-727.30	-1367.5	-39.520	1116.5
551			2.2457			-2.9127	
553			11.661		-265.37	-13.078	168.79
554			13.897		-191.48	-10.451	
561*						23.887	72.197
571	-3.2016	1.1910	5.9255	-38.607	-519.32	-1.4722	
581	138.44		22.831	-627.94	-2052.9		5408.0
599		22.005	96.378	-498.72	-9711.0		

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.

Table 15--Continued

Dependent Variable (SITC)	Coefficients V17	Coefficients V18	Constant	F-Statistic (Significance)	R^2	Standard Error
512	-.03003		7724000	38.684 (.0000)	.95942	176360
513	-.00297	20107	-10584	17.872 (.0000)	.68200	102020
514	-.00167	13730	332810	31.356 (.0000)	.94004	29276
515	.00369		-5771.2	29.619 (.0000)	.84339	32573
521	-.00025	5538.3	267020	11.324 (.0000)	.84990	7582.7
531	-.00461	63737	164800	11.934 (.0000)	.85036	52653
532	-.00026		-76236	9.9589 (.0000)	.77598	4544.6
533	-.00698		-24022	12.082 (.0000)	.82152	47835
541			1877500	14.630 (.0000)	.86245	127900
551	.00193		3143.7	8.4685 (.0000)	.58531	25369
553	.00486		21721	6.1109 (.0000)	.74324	44940
554	-.00359		-11434	14.106 (.0000)	.80446	34811
561*	-.00222	80219	-73205	26.716 (.0000)	.89474	93062
571			1171.5	18.187 (.0000)	.86865	6955.8
581	-.02158		6837900	21.754 (.0000)	.91196	204900
599	-.01038		725030	18.943 (.0000)	.88113	141750

*Only partial results are shown; further exclusion of variables would lead to near singular matrix.