Y4
W36
So 8/4
1028
DOCUMENTS
JAN 2 1977
FARRELL LIBRARY
KANSAS STATE UNIVERSITY
GOVERNMENT
Storage

94th Congress
2d Session

COMMITTEE PRINT

COMMITTEE ON WAYS AND MEANS
U.S. HOUSE OF REPRESENTATIVES

SPECIAL REPORT TO THE CONGRESS AND THE EAST-WEST FOREIGN TRADE BOARD

On

SOVIET IMPORTS OF MANUFACTURED GOODS FROM THE INDUSTRIAL WEST: AN ECONOMETRIC FORECAST

Submitted to the Congress by the

Chairman, U.S. International Trade Commission

On

JULY 28, 1976



AUGUST 11, 1976

Printed for the use of the Committee on Ways and Means

U.S. GOVERNMENT PRINTING OFFICE

75-564 O WASHINGTON : 1976 WMCP : 94-144

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

COMMITTEE ON WAYS AND MEANS

AL ULLMAN, Oregon, *Chairman*

WILBUR D. MILLS, Arkansas
JAMES A. BURKE, Massachusetts
DAN ROSTENKOWSKI, Illinois
PHIL M. LANDRUM, Georgia
CHARLES A. VANIK, Ohio
OMAR BURLESON, Texas
JAMES C. CORMAN, California
WILLIAM J. GREEN, Pennsylvania
SAM M. GIBBONS, Florida
JOE D. WAGGONNER, JR., Louisiana
JOSEPH E. KARTH, Minnesota
OTIS G. PIKE, New York
RICHARD F. VANDER VEEN, Michigan
J. J. PICKLE, Texas
HENRY HELSTOSKI, New Jersey
CHARLES B. RANGEL, New York
WILLIAM R. COTTER, Connecticut
FORTNEY H. (PETE) STARK, California
JAMES R. JONES, Oklahoma
ANDY JACOBS, JR., Indiana
ABNER J MIKVA, Illinois
MARTHA KEYS, Kansas
JOSEPH L. FISHER, Virginia
HAROLD FORD, Tennessee

HERMAN T. SCHNEEBELI, Pennsylvania
BARBER B. CONABLE, JR., New York
JOHN J. DUNCAN, Tennessee
DONALD D. CLANCY, Ohio
BILL ARCHER, Texas
GUY VANDER JAGT, Michigan
WILLIAM A. STEIGER, Wisconsin
PHILIP M. CRANE, Illinois
BILL FRENZEL, Minnesota
JAMES G. MARTIN, North Carolina
L. A. (SKIP) BAFALIS, Florida
WILLIAM M. KETCHUM, California

JOHN M. MARTIN, JR., *Chief Counsel*
J. P. BAKER, *Assistant Chief Counsel*
JOHN K. MEAGHER, *Minority Counsel*

CONTENTS

	Page
Letter of transmittal to the Speaker of the House of Representatives from the Chairman of the U.S. International Trade Commission, July 28, 1976	v
Foreword	VII
Prospects for Soviet imports of manufactured goods from industrial West	1
Appendix:	
Selection of variables	6
Assimilation of data	8
Functional relationships of data	11
Analysis of data	13
A test of the model:	
Description of the test	15
Collation of the data	17
Evaluation of the test	18

APPENDIX TABLES

1. Soviet industrial production indexes, 1961–73	23
2. Explanation of SITC codes used in this study	24
3. Selected Soviet imports from the industrial West, 1961–74	27
4. Best functional relationship between Soviet production and SITC categories	28
5. Soviet planned industrial production in index form	43
6. Soviet imports predicted for 1971–74 on the basis of equations with estimation of accuracy	44
7. Projected Soviet industrial production indexes for 1976–80	46
8. Predicted Soviet imports of selected manufactured goods from the industrial West, 1976–80	47
Sources	49

LETTER OF TRANSMITTAL

U.S. INTERNATIONAL TRADE COMMISSION,
Washington, D.C., July 28, 1976.

Hon. CARL ALBERT,
Speaker of the House of Representatives,
House of Representatives,
Washington, D.C.

DEAR MR. SPEAKER: The United States International Trade Commission is pleased to submit to the Congress, pursuant to section 410 of the Trade Act of 1974, a special report on the prospects for Soviet imports of selected manufactured goods from Western industrial countries. The report is being submitted simultaneously to the East-West Foreign Trade Board.

It is believed that this report will be of particular interest to the Committee on Ways and Means.

Sincerely,

WILL E. LEONARD, *Chairman.*

Enclosure.

FOREWORD

This report to Congress and the East-West Foreign Trade Board has been prepared pursuant to section 410 of the Trade Act of 1974 (19 U.S.C. 2440). It is an econometric forecast of imports of selected manufactured goods by the U.S.S.R. from the Western industrial nations during the current Soviet 5-year plan, 1976–80. The importance of this trade is highlighted by the Soviet emphasis in the current plan on economic modernization and the assignment of highest priority to intensive growth of industry.

Any estimates of a country's future imports are subject to revision over time. However, the estimates contained in this paper for the U.S.S.R. have a more solid foundation than estimates that might be made for market economies, because they proceed from firm plans for Soviet industrial production over the next 5 years. Nevertheless, the figures in this paper are intended as order-of-magnitude trends rather than as precise forecasts.

A summary of the findings in this report is followed by a technical appendix and tables explaining the methodology used. The report was prepared by James C. Hartigan.

Prospects for Soviet Imports of Manufactured Goods from the Industrial West

The increasing interest by the Soviet Union in modernizing its economy has resulted in expanded trade with the Industrial West 1/ over the past decade. The prospect for further increases in this trade point up the need to examine the likely Soviet demand for imports in as much detail as possible. This report provides an estimate of Soviet needs for imports of selected manufactured goods from the West through 1980. The estimate is based on statistical relationships between Soviet industrial production and Soviet imports from the Western countries during the period 1960-74. These relationships are combined with Soviet planned industrial output over the current five-year plan 2/ to derive an estimate of Soviet imports from the West during 1976-80.

It is recognized that political factors often affect Soviet trade with Western countries. They are not considered in this report because they are difficult to predict and cannot readily be incorporated in an econometric model. Political considerations would be more important in estimating Soviet imports on an individual country basis, but are less significant in this report which considers the industrial West as a whole. No attempt has been made to allocate Soviet imports during 1976-80 by individual Western countries; to do so would require

---

1/ The countries considered in this report are Austria, Belgium-Luxembourg, Canada, Denmark, France, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States, and West Germany.

2/ Pravda. Draft by CPSU Central Committee, "The Main Directions in the Economic Development of the USSR for 1976-1980." December 14, 1975.

75-564 O - 76 - 2

a prediction of price trends by country and commodity, a task beyond the scope of this report. Because the Soviet industrial production index is based on 1968 ruble values, all trade data in this report are expressed in 1968 dollar values.

Chemical products are expected to be among the most promising exports by the West to the U.S.S.R. in the next 5 years. Soviet demand should also increase for Western industrial materials, including ferrous and nonferrous metals, forest products, and construction materials. Exports of metalworking machinery from the West to the U.S.S.R. should double in 5 years, and a similar gain is in prospect for nonelectrical machinery and parts, for railway vehicles, and for office machines. Export volume of scientific and measuring instruments from the West should increase substantially. Prospects are also good for increased exports to the U.S.S.R. of some textile fabrics and yarn and thread.

On the other hand, some Western products exported to the U.S.S.R. are likely to show little or no gain or even to decline over the next 5 years. Included in this category are paper articles, steel ingots, power-generating machinery (other than electrical), agricultural machinery, textile and leather machinery, electric power machinery and switchgear and road motor vehicles.

The table on the following page highlights products with the greatest export potential and includes items that are expected to increase by one-third or more in volume from 1976 to 1980 and that will

---

1/ The countries considered in this report are Austria, Belgium-Luxembourg, Canada, Denmark, France, Italy, Japan, Netherlands, Norway, Sweden Switzerland, United Kingdom, United States, and West Germany.

The most promising Soviet imports from the industrial West, 1976-80

(In millions of 1968 dollars, f.o.b.)

Soviet import category	1976	1977	1978	1979	1980	Percentage increase 1980 over 1976
Inorganic chemicals: Oxides elements, and halogen salts	61.2	68.9	77.4	86.9	97.0	58
Plastics materials, regenerated cellulose, and artificial resins	150.5	181.0	219.2	263.7	311.1	106
Pigments and paints	30.6	34.5	39.4	45.4	51.9	70
Chemical products not elsewhere specified	81.6	149.7	275.9	468.8	806.1	887
Textile yarn and thread	152.5	163.4	175.3	188.0	202.5	33
Textile fabrics woven (not including narrow or special fabrics) other than cotton fabrics	248.8	292.8	344.1	403.6	463.9	86
Special textile fabrics and related products	92.3	111.2	133.4	159.4	185.9	101
Mineral manufactures	27.6	34.0	41.4	50.2	60.8	120
Ceramic materials and manufactures	108.4	164.4	244.5	370.3	589.3	444
Iron and steel bars, rods, angles, shapes and sections (including sheet piling)	213.9	245.4	279.9	317.7	353.4	65
Universals, plates, and sheets of iron or steel	362.5	404.1	449.3	498.7	545.1	50
Hoop and strip of iron or steel	65.6	74.7	84.6	95.4	105.6	61
Tubes, pipes and fittings of iron or steel	703.6	789.6	883.6	985.8	1,081.9	54
Office machines	119.3	151.9	1933.3	247.4	314.7	64
Metalworking machinery	491.0	601.7	732.3	885.3	1,094.4	123
Machinery and appliances (other than electrical) and machine parts not elsewhere specified	586.1	622.8	670.6	726.5	1,233.7	110
Railway vehicles	38.6	48.0	59.3	73.1	88.7	130
Scientific, medical, optical, measuring and controlling instruments and apparatus	66.6	74.6	83.4	93.5	104.3	57
Copper	17.7	23.1	30.2	38.2	49.4	179
Nickel	10.5	14.7	20.2	26.4	35.1	234

amount to $35 million or more in 1980. Since the values are expressed in 1968 dollars (in order to match Soviet industrial production plans), the current dollar value of these exports will actually be much higher. As the table shows, the largest increases in Western exports to the U.S.S.R. will be in certain chemical products, plastics materials, special textile fabrics, ceramic materials and manufactures, metal-working machinery, other nonelectrical machinery, railway vehicles, copper, nickel, and mineral manufactures all of which are expected to increase by more than 100 percent in volume between 1976 and 1980. The items with the highest value of exports in 1980 (a half billion dollars or more, expressed in 1968 dollars) are certain chemical products; woven textile fabrics; ceramic materials and manufactures; universals, plates, and sheets of iron or steel; tubes, pipes, and fittings of iron or steel; metalworking machinery; and other non-electrical machinery. Table 8 in the appendix provides more detail, showing the changes through 1980 that are expected to occur in Soviet imports from the West for 77 categories of manufactured goods.

The changes in Soviet imports that are estimated in this paper reflect, of course, the relative priorities of the current 5-year plan. The Soviets are making a concerted effort to expand their chemical sector, concentrated in synthetic products and basic chemical products. The industrial materials sector--comprising ferrous and nonferrous metals, forest products, and construction materials--will be expanded steadily under the plan. This is to

be expected, since these sectors form the backbone of any industrialization efforts. Nonferrous metals production is planned to increase somewhat faster than production of ferrous metals, which is consistent with economic modernization. Imports of these products, therefore, will also increase though not at the same high rate as Soviet domestic production. The Soviet interest in modernizing the economy also translates into increasing emphasis on machinery production and larger imports of machinery and machine tools.

It is generally though by Russian scholars in the West that Soviet imports will mount during the last year or two of each 5-year planning period because of the Soviets' inability to meet their domestic production targets. The evidence from this study tends to refute that suggestion, as pointed out in the appendix. Therefore, no expectation that imports by the Soviets will rise above the trend in 1979 or 1980 is warranted.

Appendix

Selection of variables

The model to be employed for the purpose of predicting Soviet imports from the industrial West is one based on demand factors. It is important in the specification of a demand relationship to include an activity variable. The activity variables utilized in this analysis are Soviet industrial production indexes.

Relative prices, also deemed important in the determination of import demand, are excluded from this analysis. For one thing, past research appears to indicate that income elasticities are of considerably greater significance than price elasticities in the determination of import demand. 1/ Since the model will be attempting to predict only total imports from the industrial West for each category of trade selected, the omission of relative prices from the equations specified will not seriously undermine the analysis. (If the model was intended to predict trade by the Soviet Union with each industrial West country within each product category, its efficacy would be dubious.) In addition, the function of prices in the Soviet economy lessens the seriousness of this exclusion. Prices in the Soviet Union are much more important for purposes of measurement and control than they are for allocation. The manner in which foreign trade is conducted is another attenuating factor in the significance of not including a proxy for price in the trade equations. The existence of a foreign-trade

---

1/ See Hendrik S. Houthakker and Stephen P. Maggee, "Income and Price Elasticities in World Trade," Review of Economics and Statistics, LI No. 2, May 1969, pp. 111-125.

monopoly in the Soviet Union and the concomitant removal of Soviet enterprises from the formulation of trade policy have resulted in the development of a dichotomous system of pricing wherein foreign-trade prices bear no consistent relationship to domestic prices.

Supply factors in the 14 industrial West countries are beyond the scope of this study. There are two elements of supply in the Soviet economy that could be incorporated into the model. One of these is the level of factor utilization. However, the taut supply system operating in the Soviet economy implies that a high level of factor utilization is the norm. Furthermore, deviations from full capacity should be reasonably obscured in a period of the length under consideration. This implies that this variable can be safely excluded from the analysis. The other possibility is the level of inventories in each production category. However, data on inventory accumulation would be virtually impossible to obtain. In fact, the accuracy of such data at the disposal of the Soviet planners is questionable, in view of the managerial responses that a system of taut planning elicits. That is, in order to insure that they are able to meet their targets the enterprise managers are induced to disguise inventory levels so as to exert more leverage on planning authorities for supplies.

Noneconomic factors are often cruical as a determinant of trade, but they are not considered here in view of the inherent difficulties involved in their prediction. Their absence would be more costly

were an attempt made to forecast on a country-by-country basis. Because the Soviets prefer to satisfy their needs internally or from Eastern Europe, and because the Western countries are treated as a whole, the noneconomic factors have a minimum influence on the estimates in this report.

In essence, this is a single equation specification of demand as a determinant of import flows. Simultaneity occuring through the impact of Soviet exports on the activity variable is not considered. The importance of this factor depends on Soviet supply elasticities. If they are fairly high, it reduces the probability of bias in the estimates of the demand elasticities. However, this study offers no conclusions on that aspect of the relationship.

Assimilation of data

Indexes of Soviet industrial production for the period 1960-73 are used for growth of the Soviet manufacturing sector. 1/ These indexes are disaggregated to approximately the industry level and are based on 1968 data. They are for the period 1961-73, except for

---

1/ These indexes are compiled by the Central Intelligence Agency. They are generally calculated by the Kaplan-Moorsteen method for formulating indexes from incomplete information. For a comparison of this approach with the newer Field index, see Robert Michael Field, "Civilian Industrial Production in the People's Republic of China" in China: A Reassessment of the Economy, U.S. Congress, Joint Economic Committee, Washington, U.S. Government Printing Office, July 10, 1975, pp. 146-174. For an explanation of the formulation of the particular index used in this study, wee Rush V. Greenslate and Wade E. Robertson, "Industrial Production in the USSR" in Soviet Economic Prospects for the Seventies, U.S. Congress, Joint Economic Committee, U.S. Government Printing Office, June 27, 1973, pp. 270-290.

chemicals, for which data at this level of disaggregation were available only through 1972. The series are presented in table 1.

Soviet import data from the industrial West are required for the same period. For this purpose, export data from the industrial West countries to the U.S.S.R. are used. The three-digit SITC format 1/ was chosen because it most closely corresponds to the level of disaggregation of the Soviet industrial production indexes. The particular product categories selected for consideration in the analysis are those within sectors 5, 6, 7, and 8 of the SITC system, which correspond to manufactured goods. An explanation of the SITC codes is given in table 2.

Since the trade statistics are in current dollars and the industrial production indexes are formulated on the basis of 1968 ruble values, it is necessary to express the import figures in terms of constant dollars. Because the production indexes are based on 1968, the import data have been adjusted to reflect 1968 dollars.

1/ The SITC format was revised in 1961. This precluded an earlier beginning for the period of analysis. A problem emerges, however, in that Japan did not begin to publish trade statistics according to the new format until 1962. This required concording the original and revised classifications and adjusting the Japanese data accordingly. See United Nations, Department of Economic and Social Affairs, Standard Industrial Trade Classification, revised, New York: United Nations Publishing Service, 1961, and United Nations, Department of Economic Affairs, Commodity Indexes for the Standard Industrial Trade Classification, New York: United Nations Publications, April 1953. For situations where there is not an exact concordance, the 1961 data have been prorated on the basis of the 1962 distributions. The calculations are not reproduced here.

75-564 O - 76 - 3

The selection of an appropriate deflator merits considerable attention. Ideally, the statistics should be deflated by export price indexes for each product for each country, but such indexes were not available. Since an aggregate or summary index must be used, it would be most appropriate to employ an export price index for each country. However, export price indexes were not available for every country and year of the analysis. Therefore, wholesale price indexes were used to deflate the trade data. 1/ This approach has several inadequacies. An obvious one is the possibility that the aggregate price indexes will misstate the price at which one of its components is sold. Another is that wholesale price indexes may overstate the prices at which exports are actually sold, because of the expectation that the products a country exports will be it most competitively priced and will therefore be exaggerated by a wholesale price index. In addition, the existence of a Soviet trade monopoly bargaining with individual corporations could be an analogue of the monopsony case of the theory of input markets, in that it could gain price concessions from Western enterprises through exploiting market power. Alternatively, it is possible that in some cases Western suppliers have tended to mark up their exports to the Soviet Union. 2/ These opposing tendencies may counterbalance one another to some extent.

1/ The indexes used for 1961-67 are those given in International Monetary Fund, International Financial Statistics: 1972 Supplement; and International Monetary Fund, International Financial Statistics, Washington, D.C.: Vol. XXVIII, No. 8, August 1975, was utilized for 1968-74.

2/ For a discussion of discriminatory pricing with regard to Soviet foreign trade, see Franklyn D. Holzman, Foreign Trade Under Central Planning, Cambridge, Mass.: Harvard University Press, 1974.

Following deflation of the data, the subsequent step is to sum the data across each trade category for each year to arrive at total Soviet imports in each commodity class on an annual basis. These summations are presented in table 3.

Functional relationships of data

An attempt to predict Soviet imports from the industrial West on the basis of historical trends requires a format for relating the import data to the industrial production statistics. In essence, it necessitates the determination of the appropriate functional form of the relationship. As previously mentioned, the model is a single equation system. It is unfortunate that a simultaneous system of demand equations could not have been used. Since an economy is an interdependent organism, it is obvious that a series of equations purporting to represent an aspect of its interrelationships will have correlated disturbances. However, data limitations precluded such a system at the level of disaggregation used. To have used such a system would have required the development of a considerably more aggregated model.

The following functions were selected for testing the model: 1/

1. linear: $Y = \alpha + BX + e$

   elasticity: BX/Y

2. doublelog: $\log Y = \log \alpha + B \log X + \log e$

   elasticity: B

3. semilog: $Y = \alpha + B \log X + \log e$

   elasticity: B/Y

4. hyperbolic: $Y = \alpha - B/X + e$

   elasticity: B/XY

1/ In the equations on the following page: Y represents and X represents industrial production indexes. Where there are more production categories than one in an equation, they are expanded accordingly.

5. loghyperbolic: $\log Y = \alpha - B/X + e$

elasticity: BY/X^2

6. quadratic: $Y = \alpha + BX + \gamma X^2 + e$

elasticity: $\frac{BX + 2\gamma X^2}{Y}$

In addition to the functional forms enumerated above, an equation was specified that depends both on the absolute level of the production indexes and on the rate of increase in the indexes over the previous year. The rate of expansion of industrial production is likely to affect imports, as bottlenecks begin to occur where attempts to augment production temporarily exceed domestic capacity. This rate effect should should be sufficiently independent of the absolute level as to avoid excessive multicollinearity among the regressors.

7. $Y_t = \alpha + BX_t + \gamma \left(\frac{X_t - X_{t-1}}{X_{t-1}} \right) + e$

elasticity: $\left(B + \frac{\alpha}{X_{t-1}} \right) \frac{X_t}{Y}$

The nature of the Soviet business cycle suggests another functional orm. The taut planning system extant in the Soviet economy and the existence of explicity delineated planning periods lead to a business cycle that is supply determined. To the extent that this is the case, it would be expected that Soviet imports would increase during the last year or two of each planning period, as the planners resort to foreign markets as one means by which to meet planned output targets. 1 With

---

1/ Other alternatives are to adjust the plan so as to reduce final demands or interindustry demand for the deficit commodity, drawing upon strategic reserves, or ordering an increase in the production of the deficit commodity. The last alternative is at the risk of throwing the plan out of balance.

this in mind, two equations were specified that incorporate dummy variables. One of the equations omits the last 2 years of each planning period from the regressions, while the other equation omits the last year only. The objective of this exercise is to determine whether the significance of the statistics pertaining to the equations appears to be appreciably modified and to test the significance of the dummy variable. The functions are as follows:

8. $Y = \alpha + BX = \gamma Z_1 + e$ $Z_1 = 0$ when year is 1964, 1965, 1969, 1970
$Z_1 = 1$ otherwise

elasticity: BX/Y and $\gamma Z_1/Y$

9. $Y = \alpha + BX + \gamma Z_2 + e$ $Z_2 = 0$ when year is 1965, 1970
$Z_2 = 1$ otherwise

elasticity: BX/Y and $\gamma Z_2/Y$

Analysis of data

Pilot regressions, employing the relationships specified in the previous section, suggest that a nonlinear format best approximates the historical pattern of industrial production and import movement. 1/ The quadratic function performed well with the greatest degree of consistency, while the equation for rate of change plus absolute level of production also did farily well. The results with the other functions did not indicate any marked degree of superiority.

The equations specifying dummy variables for the last year or last 2 years of the planning periods did not prove significant in any case.

1/ The pilot regressions were for SITC categories 682, 683, 674, 678, 691, 698, 719, 729, 861, and 863.

Moreover, there was no discernible pattern to the signs of these variables, but the equations suffered from considerable autocorrelation. Since the quadratic function was generally the most effective, a dummy variable was specified within that format in order to determine whether or not there was a change in trade policy as the end of a planning period approached:

$$10. \quad Y = \alpha + BX + \gamma X^2 + \delta Z_1 + e$$

Z_1 = 1 when year is 1964, 1965, 1969, 1970

Z_1 = 0 otherwise

Even with the quadratic function, the dummy variable did not prove significant, with one exception. 1/ Furthermore, it did not improve the fit of the regression line relative to the unmodified quadratic function. However, the autocorrelation was eliminated, and interpretations can therefore be deemed more accurate. An identifiable pattern did appear. All but two of the signs were positive, but only one was significant, thus casting doubt on the proposition that imports are increased as a planning period nears completion. Moreover, the coefficients, standard errors, and significance levels of the other variables were not appreciably altered. This suggests that the planners are able to monitor the achievements of the plan with sufficient scruting to adjust import volumes regularly. On the other hand, it may be that other forms of adjustment are preferred to increased imports, for alleviating deficiencies in the implementation of the plan. The caveat is that the Soviets accord more importance to quarterly and annual plans than to 5-year plans in the direction of economic activity.

1/ The dummy variables were tried for the same SITC categories enumerated in the footnote 2 on p. 10. Categories 682 and 719 had insignificant negative signs, whereas category 729 was significantly positive.

The linear, doublelog, quadratic, and rate-of-change-plus-absolute-level-of-production equations were regressed on the remainder of SITC categories. The linear and doublelog functional forms constrain the relationship to linearity while the quadratic and the rate-of-change-plus-absolute-level-of-production forms permit nonlinearity in the relationships. The best functional form for each SITC category, together with the appropriate statistics, is represented in table 4.

As can be readily determined from the table, neither the quadratic nor the doublelog functional forms were able to predominate in the chemical sector. The first derivatives of the quadratic functions for this sector revealed a tendency for imports to be increasing. However, there was no discernible tendency on the part of the second derivatives to suggest a trend for the rate of increase. In the regressions involving machinery production, there was a dominance on the part of the quadratic function. The first and second derivatives of these equations do not permit a summary statement to be made. The evidence on industrial materials indicates that imports are increasing at a decreasing rate.

A test of the model

Description of the test.--The test that has been developed for this model is to substitute planned industrial production into the equations and, using the B coefficients obtained in the regression delineated in the previous section, to generate planned imports. The latter are then compared with actual imports for the test period to obtain an insight into the predictive ability of the model. The test period selected was 1971-74. 1/

1/ Although actual industrial production indexes are not available for 1974, planned production and actual import data are. Hence, there will be four test observations for each equation. The planned production data is obtained from N. K. Baybakov, State Five-Year Plan for the Development of the USSR National Economy for the period 1971-1975, Moscow: State Publishing House for Political Literature, 1972.

It should be pointed out that for use in the prognostication of Soviet imports this model has several potential weaknesses:

1. The regression equation and its concomitantly generated coefficients may not accurately represent the relationship between production and imports. The extent of this problem varies widely among the equations. An approximation of accuracy may be gained by looking at the R-square of each equation.

2. Deviation of actual from planned production is another causal factor in the failure of the model to forecast accurately. An insight into the disruptive potential of this factor is evident in a comparison of actual production, presented in table 1 above, and planned production, given in table 7 in the next section.

3. Another possibility is that Soviet definitions of industrial categories may differ somewhat from Western analytic definitions used in the construction of the production indexes. However, this is not considered to be a significant problem.

4. A problem of more importance is that the reporting format in the 5-year plan does not coincide with that used in the industrial production indexes. Planned production is mostly reported in physical units rather than in ruble values or an index number format. Where this is the case, production data given for 1970 is deemed equivalent to the index number of that year, and planned production is modified accordingly. Where growth rates only are given, planned production indexes are generated using the 1970 index numbers as a base. This approach should not give rise to serious weaknesses because the production indexes were constructed using 1968 value-added weights, based on 1968 prices where possible, 1/ and there has not been a major price reform since July 1967. A caveat is that the Soviets often introduce new products at above long-term equilibrium rates, so as to encourage their production. However, these often remain in effect for periods longer than anticipated. 2/

1/ See Greenslade and Robertson, op. cit., pp. 270-282.

2/ For a discussion of the problems involved in the use of Soviet prices for the construction of value of output series, see Morris Bornstein, "Soviet Price Statistics," Soviet Economic Statistics, edited by Vladimir G. Treml and John P. Hardt, Durham, N.C., Duke University Press, 1972.

5. In some cases, the Soviets did not provide information pertaining to the entire class of products covered in the industrial production indexes. Where this is the case, the reported product was used as a proxy for the entire class.

Collation of the data.--As mentioned in the previous section, there is not always an exact correspondence between the categories of production used in the industrial production indexes and those delineated in the Soviet price 5-year plan. In order to provide a means of certifying the accuracy of the data used in the text, it is necessary to present the format in which the Soviets provide the plan data and the extent of modification necessary to translate it into the index number format.

For industrial materials: commercial timber was used as a proxy for forest products; steel was used for ferrous metals; aluminum and copper, for nonferrous metals; cellulose, paper, and cardboard, for paper and paperboard; and cement, for construction materials. All but the nonferrous metals was given in physical units; aluminum and copper were presented as index numbers.

For machinery: metal-cutting machine tools, motor vehicles, tractors, agricultural machine building, consumer industries equipment, forge press machine tools, and precision instruments were categorized equivalently in both sources. Agricultural machine building precision instruments, and consumer industries equipment are in ruble values; whereas the others are listed in physical units. Excavators and bulldozers proxied construction and road equipment. Power transformers were used for electric power equipment. Railroad mainline freight cars

75-564 O - 76 - 4

proxied railway machine building. Since hoist transport equipment was never explicitly mentioned in the plan, it was considered to grow at the same rate as construction and road equipment. Sanitary technical equipment was approximated by steel pipe. All of the above are given in plysical units. An estimate of the growth rate of mining and other equipment is based on the growth rates of the output of the coal, petroleum extraction, and gas industries. Boilers are not mentioned in the plan, but, based on their low growth rate in the past, their production is assumed to accrete at 1 percent per year.

For the chemical industry: synthetic fibers and synthetic resins and plastics correspond exactly to their counterparts in the historical industrial production indexes. They are listed in physical units. Basic chemistry products are proxied by caustic sode and soda ash, both of which are in physical units. Rubber and asbestos products are proxied by asbestos (grades I through VI). Lacquers and paints are assumed to grow at the rate of household chemical products, which are presented in ruble values. Aniline dye products are assigned a growth rate based on the rate of introduction of new types of dyes. Production of organic synthetics is assumed to grow at the same rate as synthetic resins and plastics. Since wood chemistry production, which has remained fairly stable historically, is neglected in the planning information available, it is assumed to have remained at the 1970 level. Planned industrial production converted to an index number format is presented in table 5.

Evaluation of the test.--The test of the predictive ability of the model is conducted by inserting the planned industrial production

indexes into the equations and, employing the coefficients determined by means of the regressions depicted above, generating what may be termed planned imports. Actual and planned imports are then compared for each year, with the smaller figure calculated as a percentage of the larger. Planned imports and their accuracy measured in percentages are presented in table 6. If planned imports exceeded actual imports, this fact is indicated by a plus sign preceding the accuracy measure. The opposite situation is dentoed by a minus sign.

An examination of table 6 reveals a clear tendency for greater accuracy in the first 2 years of the plan than in the subsequent years. In view of this tendency toward a decline in accuracy after the first 2 years, it may be suggested that the Soviets make revisions in their planning horizons as they approach the halfway mark in a planning period.

There are two other interesting points that arise from a perusal of the table. First, the model tends to overstate imports with almost exactly the same frequency that it understates them for the year 1974. This substantiates the results of the regressions with the view that the level of imports will not rise as a planning period draws to a close. This is also signficant for another reason. In 1974, movements in raw materials and gold prices and the availability of foreign credits provided the Soviet Union with its only balance-of-payments surplus in foreign trade rubles during the period under consideration. It has been alleged that balance-of-payments considerations will force the Soviets

to modify their plans for the importation of Western technology. 1/ If their balance of payments does provide such a constraint, one would expect the model used here to show a definite understatement of planned imports in 1974. This is clearly not the case. However, it may be that the surplus came as a surprise to the Soviets, and the rigidity of their system precluded a flexible adaptation.

The second point is that the degree of overstatement and understatement of imports generally supports the evidence revealed by scrutiny of the first and second derivatives of the quadratic functions.

Planned industrial production converted to the index number format is given in table 7. 2/ As is readily apparent from the projected industrial production indexes in this table, the structure of the Soviet economy has been changing considerably since 1968, the year in which the index is based. An increase in the production of synthetic resins and plastics, synthetic rubber, basic chemistry products, organic synthetic products, and synthetic fibers in the chemical industry is clearly emphasized. In the machinery sector metal cutting machine tools, forge press machine tools, motot vehicles, and precision instruments have been deemed of highest priority. This reflects the continued efforts on the part of the Soviets to modernize their economy.

1/ For a discussion of this point and the implications of more fortuitous developments in the Soviet's balance-of-payments account postulated by a gaming model, see Central Intelligence Agency, USSR: Long Range Prospects for Hard Currency Trade, Washington, Document-Expediting Project, Exchange and Gift Division, Library of Congress, January 1975.

2/ The projected industrial production indexes are based on the Communist Party of the Soviet Union Central Committee draft "The Main Directions in the Economic Development of the USSR for 1976-1980," published in Pravda on December 14, 1975.

Industrial materials 1/ continue to expand steadily, if not spectacularly. There appears to be a discernible trend towards emphasis of nonferrous over ferrous metal production. This is consistent with economic modernization. This is also true of construction and road equipment, hoist transport equipment, mining equipment, electric power equipment, light industry equipment, and railway machine building, There is a noted deemphasis on agriculture in this plan, as exemplified by tractor and agricultural machine production.

From the mere fact that the various categories of Soviet industrial production are increasing, it does not follow that the corresponding categories of imports will also increase. To determine the relationship between a particular category of imports and the pertinent industrial production index, it is necessary to consult table 4. The relationships in table 4 and planned industrial production in table 7 are used to forecast Soviet imports for 1976-80. These predictions are given in table 8.

In the interest of making a summary statement about the prospects for Soviet imports of manufactured goods, it can be said that imports of industrial materials will increase, although not at a rate commensurate with the growth of industrial production. This reflects a continuation of a secular trend of increased ability on the part of the Soviets to satisfy the basic requirements of industrialization. Within this category, the prospects for imports of nonferrous metals and basic metal structures appear dimmest.

1/ Ferrous metals, nonferrous metals, paper and paperboard, forest products, and construction materials.

It is frequently alleged that Soviet imports will increase in the last year or two of a planning period, due to an inability of the economy to fulfill required production targets. This study refutes that allegation. Therefore, no expectation that imports will deviate upward from the existing trend is warranted.

The prospects for imports of items embodying high technology are more optimistic than the values cited in the table indicate. 1/ In their emphasis on economic modernization, the Soviets are placing the highest priority on intensive growth. 2/ The existence of a foreign trade monopoly which is in a position to enact the dictates of the planners facilitates the actualization of this policy.

In summary, synthetic chemicals and other areas of advanced technology provide the best opportunities for exports to the Soviet Union.

1/ See Pravda article.

2/ Intensive growth is a result of increased productivity of the factors of production, as opposed to extensive growth which relies on increases in the quantities of those factors.

Table 1.--Soviet Industrial Production Indexes, 1961-73

(1968=100)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Industrial materials	63.06	67.67	72.37	77.68	83.35	88.74	95.00	100.00	104.38	111.78	117.90	123.72	130.58
Ferrous metals	62.80	67.86	72.15	77.66	82.99	89.17	95.21	100.00	102.71	108.53	112.80	116.88	121.56
Nonferrous metals	57.85	62.52	67.43	72.48	77.80	84.93	92.27	100.00	106.40	116.14	122.01	128.04	137.00
Forest products	78.74	81.31	85.62	89.46	90.76	91.38	96.72	100.00	102.13	107.76	111.78	115.43	120.39
Paper and paperboard	58.11	62.19	65.68	70.61	79.64	88.00	95.19	100.00	105.47	112.74	118.95	124.30	131.76
Construction materials	57.37	63.11	67.94	70.95	75.10	81.91	89.60	100.00	102.47	110.87	117.24	122.68	129.67
Machinery	61.42	67.83	72.74	76.73	80.57	87.30	93.61	100.00	106.98	113.85	123.30	132.82	143.45
Boilers	59.27	66.99	71.16	78.10	81.12	89.76	92.56	100.00	93.05	83.65	74.20	77.46	79.96
Electric power equipment	62.04	70.75	76.46	82.35	88.95	90.69	95.15	100.00	101.99	106.46	112.79	115.97	120.23
Metal-cutting machine tools	56.56	60.85	64.69	70.49	74.09	82.69	91.75	100.00	106.03	113.58	122.29	132.63	146.65
Railway machine building	94.47	98.14	101.85	103.18	102.32	103.37	100.11	100.00	99.46	105.94	110.71	115.60	115.52
Motor vehicles	62.95	68.89	73.14	76.34	74.54	82.60	90.32	100.00	105.25	111.31	141.47	169.49	194.62
Tractors	53.58	58.86	67.19	69.13	80.40	88.22	94.39	100.00	106.93	110.04	116.34	123.15	128.51
Agricultural machine-building	58.83	71.06	82.99	87.34	88.43	92.07	93.76	100.00	110.82	118.48	130.89	146.66	167.13
Construction and road equipment	59.84	65.14	68.84	76.67	81.62	88.06	95.10	100.00	108.65	114.19	124.45	131.52	136.21
Hoist transport equipment	56.46	62.09	66.82	70.81	78.52	85.98	94.09	100.00	105.58	117.87	127.02	134.39	140.75
Mining and other equipment	62.80	69.43	71.88	82.21	88.06	94.14	97.21	100.00	100.81	101.44	112.40	120.06	130.31
Consumer industries equipment	53.53	58.67	63.59	69.10	73.12	83.39	94.06	100.00	107.81	119.78	126.35	138.67	153.94
Forge press machine tools	65.58	68.37	81.39	74.88	74.88	81.86	90.23	100.00	107.90	114.41	126.97	138.13	152.56
Sanitary technical equipment	65.35	72.34	79.88	84.83	90.29	94.55	98.25	100.00	104.08	109.16	114.28	118.88	123.59
Precision instruments	42.97	50.12	56.70	59.01	65.47	74.90	86.06	100.00	118.28	144.19	158.70	180.05	204.32
Chemicals	47.72	52.66	58.58	67.00	76.79	84.68	93.16	100.00	105.88	118.23	127.77	136.62	147.69
Basic chemistry products	41.57	46.12	52.87	62.98	74.53	83.83	92.68	100.00	106.46	124.52	135.96	145.20	NA
Aniline dye products	97.51	97.52	99.26	98.11	94.03	101.16	100.24	100.00	105.87	107.97	108.65	102.11	NA
Synthetic resins and plastics	29.72	34.99	43.93	54.28	62.19	75.23	86.24	100.00	112.52	129.51	144.38	158.16	NA
Synthetic fibers	45.22	50.08	55.70	65.22	73.56	82.77	92.22	100.00	105.38	112.52	122.16	134.75	NA
Organic synthetic products	44.59	49.78	57.15	66.01	79.46	85.12	94.95	100.00	106.62	117.41	125.72	133.50	NA
Lacquers and paints	60.20	64.72	66.10	68.49	77.82	86.35	97.80	100.00	104.47	114.02	125.38	128.44	NA
Rubber and asbestos products	59.79	65.61	71.01	76.67	83.20	87.04	93.27	100.00	102.75	108.96	113.93	122.12	NA
Wood chemistry products	87.65	87.79	88.91	95.93	102.07	99.71	101.94	100.00	91.31	84.10	81.38	84.45	NA

Table 2.--Explanation of SITC codes used in this study

SITC number	Definition
512	Organic chemicals
513	Inorganic chemicals: elements, oxides, and halogen salts
514	Other inorganic chemicals
531	Synthetic organic dyestuffs, natural indigo and color 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 flavor materials
554	Soaps, cleansing and polishing preparations
581	Plastic materials, regenerated cellulose and artificial resins
599	Chemical materials and products not elsewhere specified
621	Materials of rubber
629	Articles of rubber not elsewhere specified
631	Veneers, plywood boards," improved" or reconstituted wood and other wood worked, not elsewhere specified
632	Wood manufactures, not elsewhere specified
633	Cork manufactures
641	Paper and paperboard
642	Articles made of paper pulp, of paper, or of paperboard
651	Textile yarn and thread
653	Textile fabrics woven (not including narrow or special fabrics), other than cotton fabrics
655	Special textile fabrics and related products
656	Made up articles, wholly or chiefly of textile materials, not elsewhere specified
657	Floor coverings, tapestries, etc.
661	Lime, cement and fabricated building materials, except glass and clay materials
662	Clay construction materials and refractory construction materials
663	Mineral manufactures, not elsewhere specified
664	Glass
665	Glassware
666	Ceramic materials and manufactures
667	Pearls and precious and semiprecious stone, worked or unworked
671	Pig iron, spiegeleisen, spong iron, iron and steel powders and shot and ferro-alloys
672	Ingots and other primary forms (including blanks for tubes and pipes) of iron or steel
673	Iron and steel bars, rods, angles, shapes and sections (including sheet piling)
674	Universals, plates and sheets

Table 2.--Explanation of SITC codes used in this study--Continued

SITC number	Definition
675	Hoop and strip of iron or steel
676	Rails and railway tracks construction material of iron or steel
677	Iron and steel wire (excluding wire rod)
678	Tubes, pipes and fittings of iron or steel
679	Iron and steel castings and forgings, unworked, not elsewhere specified
681	Silver, platinum and other metals of the platinum group
682	Copper
683	Nickel
684	Aluminum
685	Lead
686	Zinc
687	Tin
688	Uranium and thorium and their alloys
689	Miscellaneous nonferrous base metals employed in metallurgy
691	Finished structural parts and structures, not elsewhere specified
692	Metal containers for storage and transport
693	Wire products (excluding electric) and fencing grills
694	Nails, screws, nuts, bolts, rivets and similar articles of iron, steel or of copper
695	Tools for use in the brand or in machines
696	Cutlery
697	Household equipment of base metals
698	Manufactures of metal, not elsewhere specified
711	Power generating machinery other than electric
712	Agricultural machinery and implements
714	Office machines
715	Metal working machinery
717	Textile and leather machinery
718	Machines for special industries
719	Machinery and appliances (other than electrical) and machine parts, not elsewhere specified
722	Electric power machinery and switchgear
723	Equipment for distributing electricity
724	Telecommunications apparatus
725	Domestic electrical equipment
726	Electric apparatus for medical purposes and radiological apparatus
729	Other electrical machinery and apparatus
731	Railway vehicles
732	Road motor vehicles
733	Road vehicles other than motor vehicles

Table 2.--Explanation of SITC codes used in this study--Continued

SITC number	Definition
735	Ships and boats
812	Sanitary, plumbing, heating and lighting fixtures and fittings
861	Scientific, mechanical, optical, measuring and controlling instruments and apparatus
862	Photographic and cinematographic supplies
863	Developed cinematographic film
864	Watches and clocks

Table 3.--Selected Soviet imports from the industrial West 1961-74

(in thousands of 1968 dollars)

SITC number	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
512	10,647	20,643	30,354	29,061	38,689	43,149	56,533	53,235	58,706	50,150	50,776	53,592	62,781	123,930
513	10,639	8,137	11,954	12,220	17,265	14,428	21,597	31,831	34,966	29,605	45,078	31,032	22,520	39,569
514	165	4,352	5,493	5,249	4,779	10,586	9,872	13,152	13,342	11,763	11,468	11,273	9,028	7,349
531	1,344	1,773	5,248	5,823	10,444	9,785	9,387	9,228	9,129	8,853	9,043	9,698	10,833	23,203
532	0	2	5	6	0	8	18	63	80	47	19	94	22	90
533	3,378	2,069	2,401	2,357	3,209	5,344	8,151	10,165	14,722	14,531	13,957	13,424	9,586	15,894
541	1,478	2,200	2,811	3,718	3,736	3,034	3,622	4,168	5,086	5,684	5,402	6,596	6,631	7,833
551	2,015	2,514	3,557	2,800	2,649	2,582	3,200	2,892	1,920	2,330	2,133	2,534	2,277	2,292
553	139	74	21	3	8	216	159	250	229	372	360	389	284	1,110
554	372	2,742	3,974	5,701	8,857	7,237	8,487	14,569	12,948	15,145	10,996	11,149	11,183	17,187
581	11,254	12,642	16,431	22,779	34,059	31,663	42,610	47,721	59,159	68,497	68,188	75,124	73,839	147,564
599	3,047	4,121	14,278	20,477	14,405	15,682	18,272	23,438	26,712	23,746	24,850	28,192	28,582	51,840
621	131	0	55	239	1,132	1,699	1,223	1,175	605	1,534	1,455	1,278	1,997	1,729
629	2,882	10,144	9,007	6,715	7,765	6,835	6,038	6,425	3,166	2,403	6,120	5,102	6,236	14,461
631	1,451	1,389	937	574	251	808	797	1,535	1,056	992	800	868	5,469	421
632	267	76	30	106	78	229	143	542	214	427	317	437	376	408
633	0	0	0	0	8	67	4	18	7	3	1	34	1	21
641	5,501	5,605	5,887	5,021	5,932	4,643	15,696	32,877	33,484	47,699	41,420	29,149	35,459	42,590
642	407	1,155	1,206	935	1,602	2,466	3,096	4,430	6,529	4,330	2,995	3,098	4,196	4,993
651	11,099	19,427	16,133	9,291	20,724	42,154	58,667	64,932	76,172	82,203	75,620	84,374	63,034	93,669
653	6,924	24,036	25,677	23,118	21,254	10,162	18,320	45,047	59,303	61,828	70,357	77,879	47,465	62,210
655	387	1,367	2,427	4,267	4,458	3,005	3,942	3,920	11,845	10,491	14,673	27,153	29,897	29,905
656	731	1,004	1,012	1,167	1,480	512	403	340	493	626	5,990	2,644	1,175	774
657	1,099	826	663	268	444	804	284	155	435	124	180	337	745	1,460
661	0	216	215	21	5	7	52	86	95	219	203	230	216	241
662	548	1,114	665	1,222	1,436	510	1,486	1,182	2,040	1,205	1,701	2,753	2,611	4,829
663	331	734	1,213	1,386	1,109	1,021	1,475	2,217	2,631	3,881	4,351	7,675	6,058	8,009
664	29	57	272	1,696	1,730	1,097	1,133	1,819	2,444	2,631	2,194	2,373	2,166	2,311
665	413	757	360	610	265	320	343	347	247	630	158	296	127	263
666	100	18	53	9	52	324	258	275	471	2,728	6,938	9,991	1,805	7,024
667	0	262	44	279	136	248	111	228	13	61	237	848	1,035	2,336
671	37	0	60	466	52	25	70	4	3	46	758	1,193	2,268	2,124
672	81	0	267	0	5	28	0	31	16	115	39	4	139	733
673	25,472	44,884	42,815	7,697	5,279	79	718	820	1,338	2,041	23,462	43,186	116,680	412,425
674	65,290	94,970	94,009	37,853	20,888	21,835	58,757	80,004	99,316	112,428	98,015	121,749	207,173	399,794
675	3,309	5,856	2,658	179	330	551	924	1,155	901	1,866	10,356	14,481	37,015	62,668
676	15	423	40	4	16	6	22	31	10	1	1	6	113	5
677	392	398	353	235	248	267	468	659	813	1,434	1,408	1,352	4,123	7,375
678	86,741	126,644	57,170	34,092	74,904	50,646	42,273	67,272	109,355	150,115	189,796	219,886	383,848	377,599
679	6,508	114	19	1	9	0	4	2	2,197	1,618	842	442	588	158
681	0	0	2	1	0	1	77	4	13	114	60	165	6	17
682	7,163	27,240	19,047	3,440	1,892	762	990	5,666	3,991	3,702	3,328	3,850	6,152	11,703
683	16,270	5,847	5,530	62	18	3	444	18	133	49	42	52	230	75
684	213	47	98	84	141	720	1,460	1,266	1,179	967	1,288	1,046	761	2,199
685	97	0	14	6	9	25	0	22	0	805	7	0	1,242	2,316
686	0	0	39	0	15	1	33	56	54	69	120	118	20	53
687	0	142	5,405	6,979	11,440	7,611	10,165	10,965	13,654	16,472	4,202	3,859	4,045	4
689	1,735	2,333	2,697	399	1,046	994	38	493	976	1,681	1,502	3,200	1,814	1,839
691	3,131	3,957	2,693	4,177	1,588	2,589	1,865	1,205	8,430	4,468	5,981	9,912	6,492	10,374
692	7,586	3,468	3,072	1,803	2,498	2,599	2,667	6,457	2,841	925	3,084	5,257	4,623	3,050
693	4,572	1,656	3,880	3,407	4,210	5,016	5,397	4,567	5,895	7,504	7,201	4,885	8,572	11,892
694	154	194	144	42	139	167	263	505	266	1,033	3,590	3,539	1,811	549
695	1,059	1,600	1,689	4,803	1,639	1,093	3,197	7,125	11,068	16,450	10,284	10,598	11,658	14,339
696	115	472	402	510	953	284	212	195	394	841	2,673	117	91	152
697	12	40	2	9	16	15	23	49	43	148	111	113	46	85
698	3,993	1,124	1,242	846	858	1,742	5,445	3,038	4,882	5,074	5,808	12,456	10,493	9,680
711	8,316	9,331	7,934	6,533	9,347	5,806	10,771	21,731	7,398	11,237	13,348	21,531	20,958	25,611
712	425	1,351	212	716	1,298	3,413	3,404	6,560	2,487	27,528	16,705	3,972	24,115	10,539
714	1,662	2,194	934	1,648	1,710	4,742	6,087	7,926	13,221	21,266	26,218	26,398	26,266	17,775
715	28,694	21,824	26,900	32,524	24,194	23,198	35,006	74,283	228,578	175,479	126,660	220,818	297,392	334,994
717	44,223	23,902	25,937	29,198	23,925	34,274	62,566	99,266	73,504	26,088	15,548	38,762	50,490	60,118
718	75,575	87,705	47,646	57,429	26,035	29,620	37,796	47,392	51,563	65,138	56,116	57,231	82,420	106,825
719	153,922	196,118	165,091	134,073	116,946	136,131	208,806	243,690	288,660	231,734	276,432	414,188	545,878	518,660
722	20,391	23,916	21,256	9,479	8,678	6,690	9,620	11,016	16,549	16,316	19,792	19,712	18,613	26,624
723	9,355	10,387	8,208	4,740	4,742	9,389	5,802	10,168	15,304	13,206	11,905	7,510	9,934	23,241
724	3,206	1,233	1,270	788	3,569	4,417	4,523	6,111	8,183	13,766	4,754	7,389	9,924	11,610
725	118	62	31	123	176	180	668	1,368	355	400	1,052	851	698	610
726	2,874	1,775	1,239	1,762	2,203	2,909	2,830	5,069	3,221	3,628	5,076	6,105	6,730	7,969
729	20,356	16,411	18,093	24,585	17,536	22,149	26,089	31,515	73,455	85,945	63,555	79,675	84,594	116,489
731	7,411	2,910	218	101	120	60	73	454	4,453	5,398	10,842	11,610	15,776	15,052
732	1,792	2,071	2,800	2,534	3,799	2,121	2,950	6,041	11,041	26,662	33,294	37,361	17,656	28,619
733	446	926	1,046	493	147	366	620	261	310	213	175	599	1,994	3,111
734	8,674	1	18	26	27	190	174	284	231	248	223	225	512	436
735	20,399	39,114	86,340	200,630	131,502	111,613	38,466	15,811	55,811	95,160	56,953	15,970	10,111	22,084
812	508	0	1,022	95	50	1,742	1,002	399	594	931	1,275	1,465	932	1,945
861	7,469	6,316	5,616	6,565	9,878	11,402	14,500	18,065	26,176	29,664	31,066	35,078	34,342	45,705
862	48	55	72	75	123	530	1,114	2,194	2,845	1,964	2,101	2,467	2,835	2,910
863	575	556	323	214	291	327	331	354	703	634	536	599	505	325
864	567	267	102	168	56	99	125	193	200	303	218	312	700	140

Table 4*: Best Functional Relationship between Soviet Production and SITC Categories 1/

$$512 = -55509.754 + 1885.312X - 8.095X^2 + e$$
$$(12994.944) \quad (316.050) \quad (1.778)$$

X = Organic Synthetic Products

$t_\alpha = -4.272 \quad t_B = 5.965 \quad tr = -4.553$

$F = 64.085 \quad R^2 = .934 \quad D.W. = 1.967 \quad df = 9$

$$\text{Log } 513 = 4.473 + 1.226 \log X + \log e$$
$$(.678) \quad (.153)$$

X = Basic Chemistry Products

$t_\alpha = 6.595 \quad t_B = 8.008$

$F = 64.130 \quad R^2 = .865 \quad D.W. = 2.113 \quad df = 10$

$$514 = -12980.225 + 415.713X - 1.712X^2 + e$$
$$(3569.560) \quad (84.597) \quad (.454)$$

X = Basic Chemistry Products

$t_\alpha = -3.636 \quad t_B = 4.914 \quad t_\gamma = -3.771$

$F = 35.021 \quad R^2 = .886 \quad D.W. = 1.988 \quad df = 9$

$$\text{Log } 531 = -20.539 + 6.349 \log X + \log e$$
$$(21.384) \quad (4.634)$$

X = Aniline Dye Products

$t_\alpha = -.960 \quad t_B = 1.370$

$F = 1.877 \quad R^2 = .158 \quad D.W. = .542 \quad df = 10$

$$\text{Log } 532 = 19.544 - 7.607 \log X_1 + 4.126 \log X_2 + e$$
$$(37.799) \quad (8.911) \quad (1.022)$$

X_1 = Aniline Dye Products $\quad X_2$ = Organic Synthetic Products

$t_\alpha = .517 \quad t_{B_1} = -.854 \quad t_{B_2} = 4.034$

$F = 14.329 \quad R^2 = .804 \quad D.W. = 1.528 \quad df = 9$

1/ All logs appearing in these equations are natural logs.

Log 533 = -3.796 + 2.790 log X + e
(1.368) (.307)
X = Lacquers and Paints
t_{α} = -2.757 t_{B} = 9.093
F = 82.681 R^2 = .892 D.W. = 1.094 df = 10

$541 = 768.207 + 21.618X + .149X^2 + e$
(1569.962) (38.183) (.215)
X = Organic Synthetic Products
t_{α} = .489 t_{B_2} = .566 t_{γ} = .693
F = 39.896 R^2 = .899 D.W. = 1.376 df = 9

$551 = 1127.514 - 53.533X + 59.209Z + 27.050W - 16.609V + e$
(1657.865) (68.247) (100.302) (116.809) (114.465)
X = Synthetic Resins and Plastics, Z = Synthetic Fibers,
W = Basic Chemistry Products, V = Organic Synthetic Products
t_{α} = 1680 t_{B_1} = -.784 t_{B_2} = .590 t_{B_3} = .232 t_{B_4} = -.145
F = .529 R^2 = .232 D.W. = 1.887 df = 7

$554 = -15016.860 + 450.513X - 1.832X^2 + e$
(4293.661) (101.758) (.546)
X = Basic Chemistry Products
t_{α} = -3.497 t_{B} + 4.427 t_{γ} = -3.355
F = 30.085 R^2 = .870 D.W. = 2.014 df = 9

$581 = 3012.304 + 477.837X_1 + 45.620X_2 - 758.060X_3 + 778.880X_4 + e$
(20986.467) (418.209) (796.165) (813.036) (721.177)
X_1 = Synthetic Resins and Plastics, X_2 = Synthetic Fibers,
X_3 = Synthetic Rubber, X_4 = Organic Synthetic Products
t_{α} = -.143 t_{B_1} = 1.142 t_{B_2} = .057 t_{B_3} = -.932 t_{B_4} = 1.080
F = 71.868 R^2 = .976 D.W. = 1.696 df = 7

$$\text{Log } 599 = -5.123 - \underset{(15.296)}{3.904 \log X_1} + \underset{(5.535)}{7.321 \log X_2} - \underset{(3.340)}{8.897 \log X_3} - \underset{(6.208)}{5.245 \log X_4} + \underset{(3.309)}{3.148 \log X_5} + \underset{(7.038)}{8.844 \log X_6} + \underset{(5.656)}{2.078 \log X_7} + \underset{(2.834)}{}$$

X_1 = Basic Chemistry Products, X_2 = Synthetic Resins and Plastics, X_3 = Synthetic Fibers, X_4 = Synthetic Rubber, X_5 = Organic Synthetic Products, X_6 = Rubber and Asbestos Products, X_7 = Wood Chemistry Products

$t_\alpha = -.335$ $t_{B_1} = -.705$ $t_{B_2} = 2.192$ $t_{B_3} = -1.433$
$t_{B_4} = -1.585$ $t_{B_5} = .447$ $t_{B_6} = 1.564$ $t_{B_7} = .733$

$F = 21.043$ $R^2 = .973$ D.W. = 1.950 df = 4

$$621 = \underset{(2817.918)}{-5403.397} + \underset{(64.159)}{119.253X} - \underset{(.353)}{.527X^2} + e$$

X = Rubber and Asbestos Products

$t_\alpha = -1.917$ $t_B = 1.858$ $t_\gamma = -1.493$

$F = 8.540$ $R^2 = .655$ D.W. = 1.652 df = 9

$$629 = \underset{(16178.062)}{637.648} + \underset{(368.345)}{179.166X} - \underset{(2.028)}{1.264 X^2} + e$$

X = Rubber and Asbestos Products

$t_\alpha = .039$ $t_B = .486$ $t_\gamma = -.623$

$F = 1.156$ $R^2 = .204$ D.W. = 1.770 df = 9

$$631 = \underset{(16899.303)}{46479.213} - \underset{(344.109)}{969.648X} + \underset{(1.729)}{5.106X^2} + e$$

X = Forest Products

$t_\alpha = 2.750$ $t_B = -2.818$ $t_\gamma = 2.953$

$F = 6.775$ $R^2 = .575$ D.W. = 1.687 df = 10

$$\text{Log } 632 = \underset{(6.642)}{-13.888} + \underset{(1.451)}{4.183 \log X} + \log e$$

X = Forest Products

$t_\alpha = -2.091$ $t_B = 2,882$

$F = 8.307$ $R^2 = .430$ D.W. = 1.828 df = 11

$$633 = 24.694 + .165X_t - 808.776 \frac{(X_t - X_{t-1})}{(X_{t-1})} + e$$
$$(41.640)\ (.417)\quad (321.663)$$

X = Forest Products

$t_\alpha = .593 \quad t_B = .396 \quad t_\gamma = -2.514$

$F = 3.161 \quad R^2 = .413 \quad D.W. = 2.555 \quad df = 9$

$$641 = -21245.954 + 580.485X_t - 167891.496 \frac{(X_t - X_{t-1})}{(X_{t-1})} + e$$
$$(17701.812)\ (134.327)\quad (114986.038)$$

X = Paper and Paperboard

$t_\alpha = 1.200 \quad t_B = 4.321 \quad t_\gamma = 1.460$

$F = 15.426 \quad R^2 = .794 \quad D.W. = 1.469 \quad df = 9$

$$642 = -12191.274 + 282.129X - 1.222X^2 + e$$
$$(5347.429)\ (119.698)\quad (.636)$$

$t_\alpha = -2.280 \quad t_B = 2.357 \quad t_\gamma = 1.921$

$F = 10.893 \quad R^2 = .685 \quad D.W. = 1.280 \quad df = 10$

$$651 = 10635.459 + 794.409X - 310087.982 \frac{(X_t - X_{t-1})}{(X_{t-1})} + e$$
$$(13025.094)\ (80.671)\quad (69482.377)$$

X = Synthetic Fibers

$t_\alpha = .816 \quad t_B = 9.847 \quad t_\gamma = -4.463$

$F = 123.673 \quad R^2 = .969 \quad D.W. = 2.022 \quad df = 9$

$$653 = 40880.957 - 973.017X + 9.695X^2 + e$$
$$(32940.456)\ (802.456)\quad (4.526)$$

X = Synthetic Fibers

$t_\alpha = 1.241 \quad t_B = -1.212 \quad t_\gamma = 2.142$

$F = 22.945 \quad R^2 = .836 \quad D.W. = 1.151 \quad df = 9$

$$655 = 19556.050 - 576.105X + 4.542X^2 + e$$
$$(7629.928)\ (185.870)\quad (1.048)$$

X = Synthetic Fibers

$t_\alpha = 2.563 \quad t_B = -3.099 \quad t_\gamma = 4.334$

$F = 44.905 \quad R^2 = .909 \quad D.W. = 1.773 \quad df = 9$

$656 = 5414.316 - 131.671X + .887X^2 + e$

(4177.029) (101.755) (.574)

X = Synthetic Fibers

$t_\alpha = 1.296 \quad t_B = -1.294 \quad t_\gamma = 1.546$

$F = 2.597 \quad R^2 = .366 \quad D.W. = 2.512 \quad df = 9$

$657 = 2125.519 - 32.800X + .143X^2 + e$

(615.102) (14.984) (.084)

X = Synthetic Fibers

$t_\alpha = 3.455 \quad t_B = -2.189 \quad t_\gamma = 1.689$

$F = 8.111 \quad R^2 = .643 \quad D.W. = 2.060 \quad df = 9$

$661 = 782.488 - 16.916X + .100X^2 + e$

(523.657) (11.350) (.059)

X = Construction Materials

$t_\alpha = 1.489 \quad t_B = -1.490 \quad t_\gamma = 1.688$

$F = 3.419 \quad R^2 = .406 \quad D.W. = 1.590 \quad df = 10$

$662 = -1015.590 + 25.792X + e$

(579.257) (5.986)

X = Construction Materials

$t_\alpha = -1.753 \quad t_B = 4.309$

$F = 18.565 \quad R^2 = .628 \quad D.W. = 2.445 \quad df = 11$

$663 = 19248.429 - 603.957X + 2.265X^2 + 126.278Z + .839Z^2 + e$

(3640.405) (422.424) (2.345) (386.723) (2.208)

X = Construction Materials, Z = Rubber and Asbestos Products

$t_\alpha = 5.287 \quad t_{B_1} = -1.430 \quad t_{\gamma_1} = .966 \quad t_{B_2} = .326 \quad t_{\gamma_2} = .380$

$F = 67.253 \quad R^2 = .975 \quad D.W. = 2.075 \quad df = 7$

$664 = -7396.732 + 158.456X - .647X^2 + e$

(3090.954) (66.996) (.349)

X = Construction Materials

$t_\alpha = -2.393 \quad t_B = 2.365 \quad t_\gamma = -1.853$

$F = 16.630 \quad R^2 = .769 \quad D.W. = 1.532 \quad df = 10$

$$665 = 784.006 - 5.127 + 1377.673 \left(\frac{X_t - X_{t-1}}{X_{t-1}}\right) + e$$

(326.660) (2.593) (2415.981)

X = Construction Materials

$t_\alpha = 2.400 \quad t_B = -1.977 \quad t_\gamma = .570$

$F = 2.546 \quad R^2 = .361 \quad D.W. = 2.526 \quad df = 9$

$$\text{Log } 666 = -31.065 + 8.130 \log X + \log e$$

(6.136) (1.355)

X = Construction Materials

$t_\alpha = -5.663 \quad t_B = 6.000$

$F = 36.005 \quad R^2 = .766 \quad D.W. = 1.488 \quad df = 11$

$$667 = 3053.698 - 71.147X + .420X^2 + e$$

(1259.842) (27.307) (.142)

X = Construction Materials

$t_\alpha = 2.424 \quad t_B = 2.605 \quad t_\gamma = 2.952$

$F = 10.465 \quad R^2 = .677 \quad D.W. = 1.459 \quad df = 10$

$$671 = 8890.982 - 216.862X + 1.296X^2 + e$$

(2918.454 (65.202) (.353)

X = Ferrous Metals

$t_\alpha = 3.046 \quad t_B + -3.326 \quad t_\gamma = 3.676$

$F = 14.442 \quad R^2 = .743 \quad D.W. = .902 \quad df = 10$

$$672 = 798.803 - 16.512X + .088X^2 + e$$

(624.730) (13.957) (.075)

X = Ferrous Metals

$t_\alpha = 1.278 \quad t_B = -1.183 \quad t_\gamma = 1.167$

$F = .708 \quad R^2 = .124 \quad D.W. = 2.797 \quad df = 10$

$$673 = 681873.456 - 15352.380X + 85.608X^2 + e$$

(154461.946) (3450.965) (18.662)

X = Ferrous Metals

$t_\alpha = 4.414 \quad t_B = -4.449 \quad t_\gamma = 4.587$

$F = 11.527 \quad R^2 = .697 \quad D.W. = 1.296 \quad df = 10$

$674 = 783579.717 - 17490.318X + 103.215X^2 + e$

(198423.722) (4433.024) (23.973)

X = Ferrous Metals

$t_\alpha = 3.949$ $t_B = -3.945$ $t_\gamma = 4.305$

$F = 17.322$ $R^2 = .776$ D.W. = 1.539 df = 10

$675 = 164891.964 - 3923.343X + 22.909X^2 + e$

(40316.616) (900.722) (4.871)

X = Ferrous Metals

$t_\alpha = 4.090$ $t_B = -4.356$ $t_\gamma = 4.703$

$F = 18.472$ $R^2 = .787$ D.W. = 1.254 df = 10

$676 = 228.248 - 1.883X + e$

(161.470) (1.701)

X = Ferrous Metals

$t_\alpha = 1.414$ $t_B = -1.107$

$F = 1.226$ $R^2 = .100$ D.W. = 2.314 df = 11

$677 = 12392.501 - 302.763X + 1.856X^2 + e$

(4008.474) (89.554) (.484)

X = Ferrous Metals

$t_\alpha = 3.091$ $t_B = -3.381$ $t_\gamma = 3.822$

$F = 20.363$ $R^2 = .803$ D.W. = 1.953 df = 10

$678 = 1528533.986 - 35597.195X + 211.692X^2 + e$

(255672.993) (5712.042) (30.890)

X = Ferrous Metals

$t_\alpha = 5.978$ $t_B = -6.232$ $t_\gamma = 6.853$

$F = 47.633$ $R^2 = .905$ D.W. = 2.099 df = 10

$679 = 26363.750 - 548.031X + 2.841X^2 + e$

(12907.930) (288.379) (1.559)

X = Ferrous Metals

$t_\alpha = 2.042$ $t_B = -1.900$ $t_\gamma = 1.822$

$F = 2.155$ $R^2 = .301$ D.W. = 1.411 df = 10

Log 681 = -22.906 + 5.509 log X + e
(79.188) (.754)
X = Nonferrous Metals
t_{α} = -2.289 t_B = 2.539
F = 6.447 R^2 = .446 D.W. = 2.417 df = 11

682 = 72507.168 - 1321.249X + 6.167X^2 + e
(30313.734) (661.603) (3.412)
X = Nonferrous Metals
t_{α} = 2.392 t_B = -1.997 t_{γ} = 1.807
F = 3.340 R^2 = .400 D.W. = 1.814 df = 10

683 = 54474.860 - 1044.182X + 4.846X^2 + e
(13053.691) (284.899) (1.469)
X = Nonferrous Metals
t_{α} = 4.173 t_B = -3.665 t_{γ} = 3.298
F = 11.797 R^2 = .702 D.W. = 1.235 df = 10

684 = -4486.509 + 99.881X - .442X^2 + e
(1387.991) (30.293) (.442)
X = Nonferrous Metals
t_{α} = -3.232 t_B = 3.297 t_{γ} = -2.832
F = 13.871 R^2 = .735 D.W. = 1.181 df = 10

685 = 2015.433 - 49.967X + .301X^2 + e
(1429.794) (31.205) (.161)
X = Nonferrous Metals
t_{α} = -1.410 t_B = -1.601 t_{γ} = 1.870
F = 4.565 R^2 = .477 D.W. = 2.378 df = 10

686 = -149.266 + 2.993X - .010X^2 + e
(149.238) (3.257) (.017)
X = Nonferrous Metals
t_{α} = -1.000 t_B = .919 t_{γ} = -.578
F = 5.213 R^2 = .510 D.W. = 1.669 df = 10

$687 = -58824.767 + 1417.170X - 7.082X^2 + e$

(14424.292) (314.813) (1.624)

X = Nonferrous Metals

$t_\alpha = -4.078 \quad t_B = 4.502 \quad t_\gamma = -4.362$

$F = 10.678 \quad R^2 = .681 \quad D.W. = 2.276 \quad df = 10$

688 = Not imported

$689 = 10580.111 - 208.084X + 1.101X^2 + e$

(3493.044) (676.236) (.393)

X = Nonferrous Metals

$t_\alpha = 3.029 \quad t_B = -2.729 \quad t_\gamma = 2.801$

$F = 4.049 \quad R^2 = .447 \quad D.W. = 2.456 \quad df = 10$

$\text{Log } 691 = 25.051 - 19.273 \log X + 15.553 \log Z + \log e$

(7.639) (6.551) (4.947)

X = Ferrous Metals, Z = Nonferrous Metals

$t_\alpha = 3.279 \quad t_B = -2.942 \quad t_\gamma = 3.144$

$F = 7.010 \quad R^2 = .584 \quad D.W. = 3.085 \quad df = 10$

$692 = -12096.201 + 600.375X_t - 22518.073 \left(\frac{Xt - Xt-1}{Xt-1}\right) - 670.182Z_t +$

(14440.803) (477.187) (68664.422) (502.786)

$8007.242 \left(\frac{Zt - Zt-1}{Zt-1}\right) 237.296W_t - 1857.238 \left(\frac{Wt - Wt-1}{Wt}\right) + e$

(61351.268) (177.178) (11268.564)

X = Ferrous Metals, Z = Nonferrous Metals, W = Force Press Press Machine Tools

$t_\alpha = -.838 \quad t_{B_1} = 1.258 \quad t_{\gamma_1} = -.328 \quad t_{B_2} = -1.333$

$t_{\gamma_2} = .130 \quad t_{B_3} = 1.339 \quad t_{\gamma_3} = -.165$

$F = .664 \quad R^2 = .444 \quad D.W. = 2.446 \quad df = 5$

$693 = 1431.714 - 68.076X + 106.595Z + e$

(3825.761) (149.280) (109.866)

X = Ferrous Metals, Z = Nonferrous Metals

$t_\alpha = .374 \quad t_{B_1} = .456 \quad t_{B_2} = .970$

$F = 10.044 \quad R^2 = .668 \quad D.W. = 2.580 \quad df = 10$

Log 694 = 10.723 - 20.664 log X + 18.665 log Z + .929 log W + log e

(19.951) (16.337) (16.130) (4.834)

X = Ferrous Metals, Z = Nonferrous Metals, W = Forge Press Machine Tools

t_{α} = .537 t_{B_1} = -1.264 t_{B_2} = 1.157 t_{B_3} = .192

F = 13.220 R^2 = .815 D.W. = 1.912 df = 9

695 = -44935.151 - 1548.647X - $7.575X^2$ + 3520.120Z - $5.124Z^2$ -

(48487.678) (3355.558) (15.053) (3739.893) (16.734)

194.711W - $.001W^2$ + e

(909.678) (4.908)

X = Ferrous Metals, Z = Nonferrous Metals, W = Forge Press Machine Tools

t_{α} = -.927 t_{B_1} = -.461 t_{γ_1} = -.503 t_{B_2} = .941

t_{γ_2} = -.306 t_{B_3} = -.214 t_{γ_3} = .000

F = 17.270 R^2 = .945 D.W. = 2.660 df = 6

696 = 3256.670 - 131.885X + 162.409Z - 58.217W + e

(3911.872) (157.022) (165.387) (56.314)

X = Ferrous Metals, Z = Nonferrous Metals, W = Forge Press Machine Tools

t_{α} = .832 t_{B_1} = -.840 t_{B_2} = .982 t_{B_3} = -1.034

F = .520 R^2 = .148 D.W. = 2.300 df = 9

697 = 308.740 - 15.550X + 18.276Z - 5.441W + e

(146.702) (5.889) (6.202) (2.112)

X = Ferrous Metals, Z = Nonferrous Metals, Z = Forge Press Machine Tools

t_{α} = 2.105 t_{B_1} = -2.641 t_{B_2} = 2.947 t_{B_3} = -2.576

F = 8.286 R^2 = .737 D.W. = 2.001 df = 9

698 = -2926.472 - 145.095X + 64.730Z + 149.851W + e

(10515.580) (422.095) (444.586) (151.380)

X = Ferrous Metals, Z = Nonferrous Metals, W = Forge Press Machine Tools

t_{α} = -.278 t_{B_1} = -.344 t_{B_2} = .145 t_{B_3} = .990

F = 10.723 R^2 = .781 D.W. = 2.224 df = 9

$$711 = 2592.216 + 115.100X + e$$
$$(12159.512)\ (149.566)$$

X = Boilers

$t_{\alpha} = .213 \quad t_B = .770$

$F = .592 \quad R^2 = .051 \quad D.W. = 1.145 \quad df = 11$

$$712 = -16024.642 + 76.296X + 155.140Z + e$$
$$(8189.536)(259.201)\ (210.968)$$

X = Tractors, Z = Agricultural Machine Building

$t_{\alpha} = -1.957 \quad t_{B_1} = .294 \quad t_{B_2} = .479$

$F = 4.719 \quad R^2 = .486 \quad D.W. = 2.414 \quad df = 10$

$$\text{Log } 714 = -1.618 + 2.283 \log X + \log e$$
$$(.967)\ (.213)$$

X = Precision Instruments

$t_{\alpha} = -1.673 \quad t_B = 10.720$

$F = 11.914 \quad R^2 = .913 \quad D.W. = 1.418 \quad df = 11$

$$715 = 46562.755 - 2005.800X + 25.296X^2 + e$$
$$(163433.727)\ (3498.289)\ (17.542)$$

X = Metal Cutting Machine Tools

$t_{\alpha} = .285 \quad t_B = -.573 \quad t_{\gamma} = 1.442$

$F = 24.264 \quad R^2 = .829 \quad D.W. = 1.790 \quad df = 10$

$$717 = -48941.844 + 1848.446X - 8.479X^2 + e$$
$$(75511.812)\ (1599.372)\ (7.843)$$

X = Consumer Industries Machinery and Equipment

$t_{\alpha} = -.648 \quad t_B = 1.156 \quad t_{\gamma} = -1.081$

$F = .777 \quad R^2 = .135 \quad D.W. = 1.137 \quad df = 10$

Log 718 = 22.082 + 1.429 log X - 9.231 log Z - 4.617 log W +
(3.534) (5.551) (5.399) (1.931)
9.967 log V + log e
(3.321)

X = Construction and Road Equipment, Z = Hoist Transport Equipment, W = Mining and Other Equipment, V = Consumer Industries Equipment

t_{α} = 6.249 t_{B_1} = .257 t_{B_2} = -1.710 t_{B_3} = -2.391 t_{B_4} = 3.001
F = 3.954 R^2 = .664 D.W. = 2.081 df = 8

$$719 = 432454.974 - 9370.481 X_t - 856066.430 \frac{(X_t - X_{t-1})}{(X_{t-1})} + 15516.506 Z_t -$$
(337409.605) (7434.151) (725257.810) (5647.831)
$$130509.470 \frac{(Z_t - Z_{t-1})}{(Z_{t-1})} - 7567.792 W_t + 585249.837 \frac{(W_t - W_{t-1})}{(W_{t-1})} + e$$
(527870.067) (6255.254) (760205.805)

X = Hoist Transport Equipment, Z = Consumer Industries Equipment, W = Sanitary Technical Products

t_{α} = 1.282 t_{B_1} = -1.260 t_{γ_1} = -1.180 t_{B_2} = 2.747
t_{γ_2} = -.247 t_{B_3} = -1.210 t_{γ_3} = .770
F = 22.172 R^2 = .964 D.W. = 1.986 df = 5

Log 722 = 27.020 - 6.341 log X + 2.496 log Z + log e
(3.645) (1.262) (.488)

X = Electric Power Equipment, Z = Precision Instruments

t_{α} = 7.413 t_{B_1} = -5.026 t_{B_2} = 5.114
F = 13.155 R^2 = .725 D.W. = 1.969 df = 10

$$723 = -285.297 + 44.098X - 3.767X^2 + 567.555Z - 1.404Z^2 + e$$
(56271.654) (1178.547) (7.986) (162.630) (.499)

X = Electric Power Equipment, Z = Precision Instruments

t_{α} = .006 t_{B_1} = .037 t_{γ_1} = .650 t_{B_2} = .008 t_{γ_2} = .023
F = 3.786 R^2 = .654 D.W. = 2.729 df =8

$$724 = -43924.980 + 984.317X - 8.175X^2 + 390.032Z - .662Z^2 + e$$
(49377.105) (1257.547) (8.522) (173.544) (.532)

X = Electric Power Equipment, Z = Precious Instruments

t_{α} = .889 t_{B_1} = .783 t_{γ_1} = -.959 t_{B_2} = 2.247 t_{γ_2} = -1.244
F = 5.220 R^2 = .723 D.W. = 2.095 df = 8

$$725 = -618.564 + 181.250X - 165.431Z + e$$
$$(464.702) \quad (70.945) \quad (71.217)$$

X = Electric Power Equipment, Z = Sanitary Technical Equipment

$t_\alpha = -1.331 \quad t_{B_1} = 2.555 \quad t_{B_2} = -2.323$

$F = 10.204 \quad R^2 = .671 \quad D.W. = 1.728 \quad df = 10$

$$726 = 1191.581 + 15.275X + .062X^2 + e$$
$$(1325.668) \; 26.100) \quad (.108)$$

X = Precision Instruments

$t_\alpha = .899 \quad t_B = .547 \quad t_\gamma = .580$

$F = 21.436 \quad R^2 = .811 \quad D.W. = 1.899 \quad df = 10$

$$729 = -285455.331 + 6653.659X - 58.080X^2 + 2735.959Z - 3.611Z^2 + e$$
$$(157899.690) \; (4021.425) \quad (27.253) \quad (554.966) \quad (1.702)$$

X = Electric Power Equipment, Z = Precision Instruments

$t_\alpha = -1.808 \quad t_{B_1} = 1.655 \quad t_{\gamma_1} = -2.131 \quad t_{B_2} = 4.930$
$t_{\gamma_2} = -2.121$

$F = 39.663 \quad R^2 = .952 \quad D.W. = 2.018 \quad df = 8$

$$731 = 67722.861 - 132.835X - .939X^2 - 1081.245Z + 6.499Z^2 + e$$
$$(179551.561)(3661.612)(17.826) \quad (236.483) \quad (1.336)$$

X = Railway Machine Building, Z = Hoist Transport Equipment

$t_\alpha = .377 \quad t_{B_1} = -.036 \quad t_{\gamma_1} = -.052 \quad t_{B_2} = -4.572 \quad t_{\gamma_2} = 4.864$

$F = 57.806 \quad R^2 = .967 \quad D.W. = 2.279 \quad df = 8$

$$732 = 41094.616 + 1414.555X - 6.389X^2 + 2178.163Z - 9.876Z^2 -$$
$$(67507.368) \quad (917.446) \quad (2.557) \quad (4677.815) \; (24.540)$$
$$4887.170W + 27.020W^2 + e$$
$$(4125.517) \quad (26.791)$$

X = Motor Vehicles, Z = Construction and Road Equipment,
W = Hoist Transport Equipment

$t_\alpha = .609 \quad t_{B_1} = 1.542 \quad t_{\gamma_1} = 2.498 \quad t_{B_2} = .466 \quad t_{\gamma_2} = -.402$
$t_{B_3} = -1.209 \quad t_{\gamma_3} = 1.300$

$F = 15.064 \quad R^2 = .938 \quad D.W. = 2.010 \quad df = 6$

$733 = 4026.109 - 79.841X + .415X^2 + e$

(1075.513) (22.780) (.112)

X =Consumer Industries Equipment

$t_\alpha = 3.743$ $t_{B1} = -3.505$ $t_\gamma = 3.715$

$F = 7.725$ $R^2 = .607$ D.W. = 1.489 df = 10

$735 = -108474.867 + 4701.762X - 27.691X^2 + e$

(219697.806) (4726.432) (23.871)

X = Hoist Transport Equipment

$t_\alpha = -.494$ $t_B = .995$ $t_\gamma = -1.160$

$F = 1.611$ $R^2 = .244$ D.W. = 1.116 df = 10

$812 = -1876.665 + 24.588X_t + 4203.397 \frac{(X_t - X_{t-1})}{(X_{t-1})} + e$

(1902.292) (15.118) (9007.366)

X = Sanitary Technical Products

$t_\alpha = .987$ $t_B = 1.626$ $t_\gamma = .467$

$F = 1.949$ $R^2 = .302$ D.W. = 2.290 df = 9

$861 = -7828.432 + 209.011X_t + 30678.031 \frac{(X_t - X_{t-1})}{(X_{t-1})} + e$

(2649.793) (14.321) (16871.129)

X = Precision Instruments

$t_\alpha = -2.954$ $t_B = 14.595$ $t_\gamma = 1.818$

$F = 117.742$ $R^2 = .963$ D.W. = 1.428 df = 9

$862 = -2413.308 + 54.838X - .149X^2 + e$

(733.354) (14.438) (.060)

X = Precision Instruments

$t_\alpha = -3.291$ $t_B = 3.798$ $t_\gamma = -2.501$

$F = 33.399$ $R^2 = .870$ D.W. = 1.294 df = 10

$863 = 15.436 + 1.527X_t + 1914.858 \frac{(X_t - X_{t-1})}{(X_{t-1})} + e$

(112.765) (.609) (717.973)

X = Precision Instruments

$t_\alpha = .137$ $t_B = 2.506$ $t_\gamma = 2.667$

$F = 8.307$ $R^2 = .649$ D.W. = 1.871 df = 9

$$864 = 730.460 - 11.880X + .056X^2 + e$$
$$(193.974) \quad (3.819) \quad (.016)$$

X = Precision Instruments

$t_\alpha = 3.766 \quad t_B = -3.111 \quad t_\gamma = 3.580$

$F = 9.349 \quad R^2 = .652 \quad D.W. = 1.107 \quad df = 10$

* In view of the limitations involved in selecting regressors for analysis involving Soviet data, it is important to be wary of the t statistics generated by the regressions. When there is an insufficient number of independent variables available for a regression, those that are utilized will tend to be overstated in their significance.

Table 5.--Soviet Planned Industrial Production in Index Form

(1968=100)

	1971	1972	1973	1974	1975
Ferrous metals	112.3	117.6	122.6	129.3	137.0
Nonferrous metals	123.1	132.9	143.5	160.7	173.5
Forest products	109.9	111.3	114.3	117.0	119.9
Paper and paperboard	119.4	126.9	145.8	162.8	180.2
Construction materials	117.1	123.7	130.8	138.3	146.2
Boilers	84.1	84.5	84.9	85.3	85.8
Electric power equipment	110.9	115.4	126.5	135.5	145.5
Metal cutting machine tools	113.1	116.5	122.9	130.8	147.5
Railway machine building	116.6	131.0	142.8	160.9	171.7
Motor vehicles	136.4	167.4	207.1	241.7	255.5
Tractors	112.8	114.7	120.4	130.0	137.9
Agricultural machine building	130.9	148.0	166.9	186.3	207.5
Construction and road equipment	122.6	129.1	136.2	144.5	156.9
Hoist transport equipment	126.1	132.4	139.0	147.4	159.2
Mining and other equipment	109.5	118.3	127.7	137.9	148.9
Consumer industries equipment	128.2	145.1	175.1	207.8	244.8
Forge press machine tools	115.5	122.7	132.1	150.1	179.7
Sanitary technical equipment	116.2	120.6	128.6	140.9	154.1
Precision instruments	155.0	181.2	210.2	260.0	306.0
Basic chemistry products	130.7	137.5	149.7	165.1	188.7
Aniline dye products	108.4	108.8	109.3	109.7	110.1
Synthetic resins and plastics	138.3	154.3	176.4	213.8	273.9
Synthetic fibers	121.4	134.7	149.5	164.4	192.2
Synthetic rubber	133.5	149.5	167.4	187.5	210.0
Organic synthetic products	125.6	134.4	143.8	153.9	164.6
Lacquers and paints	125.4	137.9	151.8	166.9	183.6
Rubber and asbestos products	111.8	116.8	121.8	131.4	146.4
Wood chemistry products	84.1	84.1	84.1	84.1	84.1

Table 6.--Soviet imports predicted for 1971-74 on the basis of equations with estimation of accuracy

SITC	Predicted imports (thousands of 1968 dollars)				Percent accurate			
	1971	1972	1973	1974	1971	1972	1973	1974
512	53,583.89	51,653.28	48,206.14	42,907.99	+94.76	-96.38	-76.78	-34.62
513	34,447.13	36,657.12	40,683.76	45,873.00	-76.42	+84.65	+55.35	+86.26
514	12,108.24	11,812.81	10,885.94	8,697.28	+94.71	+95.43	+82.93	+84.50
531	10,009.83	10,246.66	10,549.33	10,796.86	+90.34	+94.65	-97.38	-46.53
532	46.54	59.85	76.46	98.37	+40.83	-63.67	+28.77	-91.49
533	16,057.14	20,931.60	27,363.17	35,650.97	+86.92	+64.13	+35.03	+44.58
541	5,833.96	6,365.11	6,957.96	7,624.31	+92.60	-96.50	-95.30	-97.34
551	2,361.22	2,329.95	2,197.05	1,325.95	+90.33	-91.95	-96.49	-57.85
554	12,570.07	12,292.43	11,369.65	9,426.16	+87.48	+90.70	+98.36	-54.84
581	65,237.14	68,214.46	73,202.03	84,382.56	-95.67	-90.80	-99.14	-57.18
599	16.531.12	12,088.38	8,647.28	12,088.09	-92.23	+95.67	-65.27	-70.27
621	1,341.99	1,335.89	1,303.45	1,214.99	-92.23	-95.67	-65.27	-70.27
629	4,869.37	4,320.45	3,708.32	2,355.89	-79.56	-84.68	-59.47	-16.29
631	1,585.22	1,808.94	2,355.73	2,926.43	+50.47	+47.98	-43.07	+13.94
632	320.64	338.07	337.86	416.62	+98.86	-77.36	+99.51	+97.83
633	27.07	32.75	21.75	24.89	+ 3.69	-96.32	+ 4.60	+84.37
641	38,082.83	41,871.64	38,383.64	53,681.18	-91.94	+69.62	+92.38	+79.34
642	4,073.66	3,932.28	2,966.30	1,351.64	+73.52	+78.78	-70.69	-27.07
651	82,545.31	83,670.60	95,329.06	110,331.21	+91.61	-99.17	+66.12	+84.90
653	65,641.22	85,722.52	112,100.59	142,947.22	-93.30	+90.85	+42.34	+43.52
655	16,571.45	24,383.31	34,965.54	47,629.68	+88.54	-89.80	+85.50	+62.79
656	2,502.03	3,772.04	5,554.17	7,740.87	-41.77	+70.09	+21.16	+10.00
657	251.13	301.96	418.00	598.11	+71.69	-89.60	-56.11	-40.97
661	172.86	220.15	280.74	355.69	-85.15	-95.72	+76.94	+67.76
662	2,004.65	2,174.88	2,358.00	2,551.44	+84.95	-79.00	-90.31	-52.84
663	4,188.42	5,392.39	6,829.35	10,122.65	-96.26	-70.26	+88.70	+79.12
664	2,286.54	2,304.08	2,260.02	2,142.63	+95.95	-97.10	+95.84	-92.71
665	260.65	181.30	192.47	153.94	+60.77	-61.25	+65.98	-58.53
666	2,118.41	3,308.32	5,207.90	8,194.57	-30.53	-32.11	+34.66	+85.72
667	481.60	679.52	933.30	1,247.36	+49.21	-80.13	-90.17	-53.40
671	881.61	1,311.38	1,783.57	2,517.89	+85.98	+90.97	-78.64	+84.36
672	54.30	74.01	97.14	135.03	+71.82	+ 5.40	-69.88	-18.42
673	37,428.50	60,371.66	86,424.97	128,047.21	+62.68	+71.53	-74.07	-31.05
674	121,091.30	154,157.00	190,666.62	247,680.54	+80.94	+78.98	-92.03	-61.95
675	13,212.59	20,332.80	28,229.79	40,607.60	+78.38	+71.22	-76.27	-64.80
676	16.79	6.81	0	0	+ .06	+88.11	0	- 2.0
677	1,798.77	2,455.61	3,170.85	4,274.76	+78.28	+55.06	-76.91	-57.96
678	200,678.19	269,953.41	346,209.52	464,987.26	+94.58	+81.45	-90.19	+81.21
679	648.54	1,205.65	1,877.54	3,000.57	-77.07	+36.66	+31.32	+ 5.26
681	36.92	56.31	85.93	160.32	+61.53	-34.13	+ 6.98	+10.60
682	3,314.73	5,837.26	9,900.34	19,442.08	-99.57	+65.96	+62.14	+60.19
683	0	1,295.11	4,424.79	11,820.29	0	+ 4.02	+ 5.20	+ .63
684	1,110.95	980.89	774.64	149.94	-86.25	-93.78	+98.24	- 6.28
685	425.73	691.20	1,043.44	1,758.91	+ 1.64	0	-84.01	-75.95
686	67.68	71.88	74.31	73.46	-56.40	-60.92	+26.91	+72.15
687	8,310.99	4,431.94	0	0	+50.56	+87.07	0	0
689	1,649.10	2,372.06	3,392.12	5,573.78	+91.08	-74.13	+53.48	+32.99
691	7,454.27	10,085.98	14,919.27	31,103.46	+80.24	+98.28	+43.51	+33.35
692	0	0	0	0	0	0	0	0
693	6,908.62	7,592.45	8,381.98	9,759.30	-95.94	+64.34	-97.78	+82.06
694	1,819.05	2,952.04	5,894.80	18,297.13	+50.64	+83.41	+30.72	+ 3.00
695	18,798.48	21,599.19	25,226.48	32,292.18	+54.71	+49.07	+46.21	+44.59
696	1,714.47	2,187.92	2,702.80	3,564.69	-64.14	+ 5.35	+ 3.37	+ 4.26
697	183.87	241.33	306.16	418.38	+60.39	+46.82	+15.02	+20.32
698	6,055.41	6,999.69	8,368.95	11,207.49	+95.91	-56.20	-79.76	+86.37
711	12,272.13	12,318.17	12,364.21	12,410.27	-91.94	-57.21	-59.00	-48.46
712	12,889.37	15,687.23	19,054.26	22,796.42	-77.22	+25.32	-79.01	+46.23

Table 6.--Soviet imports predicted for 1971-74 on the basis of equations with estimation of accuracy--Continued

SITC	Predicted imports (thousands of 1968 dollars)				Percent accurate			
	1971	1972	1973	1974	1971	1972	1973	1974
714	19,853.58	28,358.72	39,799.90	64,668.93	-75.72	+93.09	+66.00	+27.49
715	143,283.34	156,210.69	182,131.09	216,984.27	+88.40	-70.74	-61.24	-64.77
717	48,674.53	40,750.72	14,754.83	0	+31.94	+95.12	-29.22	0
718	494,350.47	98,715.77	310,518.88	759,943.98	+11.35	+58.03	+26.54	+14.06
719	329,501.27	492,759.78	842,845.45	1,189,144.38	+83.89	+84.05	+64.53	+43.62
722	17,178.07	19,696.67	15,942.70	17,526.36	-86.79	-99.92	-85.63	-65.83
723	12,515.48	11,380.69	2,278.29	0	+95.12	+65.99	-22.93	0
724	9.243.41	9,735.48	2,507.62	0	+51.43	+75.90	-25.27	0
725	258.98	346.71	1,035.13	631.58	-24.62	-40.74	+67.43	-96.58
726	4,893.76	5,813.88	6,931.60	9,094.28	-96.41	-95.23	+97.9	-87.63
729	75,439.94	86,110.48	42,371.87	16,997.88	+84.25	+92.53	-50.09	-14.57
731	6,465.04	4,976.37	4,880.21	3,866.82	-59.63	-42.86	-30.93	-25.69
732	47,150.38	42,056.15	16,220.57	0	+70.61	+88.84	-91.87	0
733	611.12	1,178.59	2,769.85	5,355.20	+28.64	+50.82	+71.99	+58.09
735	44,096.92	28,621.84	10,052.24	0	-77.43	+55.80	-99.42	0
812	1,249.91	1,247.81	1,564.18	1,989.82	-98.03	-85.17	+59.58	+97.75
861	26,865.93	35,229.94	41,015.52	53,782.58	-86.48	+99.57	+83.73	+84.98
862	2,506.86	2,631.15	2,418.81	1,172.17	+83.81	+93.76	-85.32	-40.28
863	395.54	615.80	642.87	866.12	-73.79	+97.27	+78.55	+37.52
864	234.46	416.48	707.59	1,427.26	+92.98	+74.91	+98.93	+ 9.81

Table 7.--Projected Soviet industrial production indexes for 1976-80

(1968=100)

	1976	1977	1978	1979	1980
Ferrous metals	140.4	143.9	147.5	151.2	154.5
Nonferrous metals	158	166	175	184	195
Forest products	134	138	142	147	512
Paper and paperboard	152	158	165	172	180
Construction materials	190	200	210	221	234
Boilers	86.7	87.5	88.4	89.3	90.2
Electric power equipment	147	154	162	170	178
Metal cutting machine tools	178	193	209	226	247
Railway machine building	126	133	140	147	156
Motor vehicles	264	290	319	351	384
Tractors	138	139	141	142.5	144
Agricultural machine building	209.5	211.7	213.8	215.9	218.1
Construction and road equipment	166.3	176.3	186.9	198.1	210
Hoist transport equipment	168.7	178.9	189.6	201	213
Mining and other equipment	162	175	189	204	220
Consumer industries equipment	185	196	208	221	234
Forge press machine tools	197	216	236	258	279
Sanitary technical equipment	145	150	155	160	166
Precision instruments	340	378	420	468	520
Basic chemistry products	209	230	253	278	304
Aniline dye products	110.4	110.8	111	111.7	112
Synthetic resins and plastics	316	363	418	481	550
Synthetic fibers	205	219	234	250	265
Synthetic rubber	206	224	242	262	285
Organic synthetic products	184	211	243	280	320
Lacquers and paints	158	165	173	182	191
Rubber and asbestos products	159	168	178	189	200
Wood chemistry products	84.1	84.1	84.1	84.1	84.1

Table 8.--Predicted Soviet imports of selected manufactured goods from the industrial West, 1976-80

(thousands of 1968 dollars, f.o.b.)

SITC	1976	1977	1978	1979	1980
512	17,325	0	0	0	0
513	61,249	68,877	77,415	86,895	96,962
514	0	0	0	0	0
531	11,242	11,503	11,635	12,109	12,317
532	195	335	591	1,012	1,721
533	30,596	34,530	39,406	45,396	51,940
541	9,790	11,963	14,820	18,503	22,943
551	0	0	0	0	0
554	0	0	0	0	0
581	150,514	180,996	219,241	263,732	311,106
599	81,610	149,692	275,872	468,837	806,130
621	235	0	0	0	0
629	0	0	0	0	0
631	8,230	9,906	11,746	14,276	17,062
632	735	831	936	1,082	1,245
633	22	23	25	20	22
641	60,088	63,843	67,096	71,560	74,432
642	2,459	1,879	1,091	183	0
651	152,494	163,434	175,288	188,035	202,548
653	248,845	292,772	344,054	403,564	463,863
655	92,332	111,228	133,449	159,405	185,850
656	15,698	19,120	23,172	27,934	32,811
657	1,411	1,801	2,280	2,863	3,476
661	1,178	1,399	1,640	1,928	2,300
662	3,885	4,143	4,401	4,684	5,020
663	27,552	33,952	41,364	50,235	60,760
664	0	0	0	0	0
665	0	0	0	0	0
666	108,370	164,443	244,503	370,298	589,341
667	4,698	5,624	6,635	7,843	9,403
671	3,990	4,521	5,100	5,730	6,327
672	215	245	278	314	348
673	213,918	245,369	279,906	317,716	353,415
674	362,530	404,018	449,329	498,687	545,093
675	65,640	74,704	84,613	95,415	105,579
676	0	0	0	0	0
677	6,470	7,257	8,114	9,045	9,919
678	703,594	789,648	883,571	985,822	1,081,908
679	5,422	6,331	7,339	8,451	9,508
681	146	191	256	338	465
682	17,703	23,118	30,153	38,187	49,364
683	10,470	14,677	20,152	26,412	35,129
684	260	0	0	0	0
685	1,635	2,015	2,489	3,012	3,717
686	74	72	68	63	54
687	0	0	0	0	0
689	5,188	6,437	7,884	9,568	11,869
691	4,417	6,469	9,255	12,847	20,373
692	0	0	0	0	0
693	8,716	9,324	10,045	10,766	11,700
694	2,839	4,608	8,167	13,929	27,568
695	0	0	0	0	0
696	0	0	0	0	0
697	0	0	0	0	0
698	16,450	19,293	22,364	25,736	29,087
711	12,571	12,663	12,767	12,871	12,974
712	27,006	27,424	27,902	28,342	28,798
714	119,310	151,959	193,281	247,447	314,736

Table 8.--Predicted Soviet imports of selected manufactured goods from the industrial West, 1976-80--Continued

(thousands of 1968 dollars, f.o.b.)

SITC	1976	1977	1978	1979	1980
715	491,009	601,694	732,305	885,270	1,094,414
717	2,827	0	0	0	0
718	39,906	31,413	25,292	19,821	16,386
719	586,097	622,803	670,554	726,539	1,233,731
722	20,436	19,821	18,704	18,044	17,528
723	0	0	0	0	0
724	0	0	0	0	0
725	2,038	2,479	3,102	3,725	4,182
726	13,552	15,824	18,544	21,920	25,899
729	0	0	0	0	0
731	38,632	48,013	59,345	73,141	88,697
732	2,865	0	0	0	0
733	3,459	4,320	5,374	6,650	8,067
735	0	0	0	0	0
812	1,839	1,956	2,075	2,193	2,363
861	66,644	74,607	83,365	93,495	104,266
862	0	0	0	0	0
863	747	806	869	949	1,022
864	3,165	4,241	5,619	7,436	9,695

Sources

Baybakov, N.K. State Five Year Plan for the Development of the USSR National Economy for the Period 1971-1975. Moscow: State Publishing House for Political Literature, 1972.

Bornstein, Morris. "Soviet Price Statistics." Soviet Economic Statistics. Edited by Vladimir G. Treml and John P. Hardt. Durham, N.C.: Duke University Press, 1972.

Central Intelligence Agency. USSR: Long Range Prospects for Hard Currency Trade. Washington: Document Expediting Project, Exchange and Gift Division, Library of Congress, January 1975.

_____. Soviet Production Indexes, 1960-73. Washington: Unclassified Material, 1975.

Field, Robert Michael. "Civilian Industrial Production in the People's Republic of China." China: A Reassessment of the Economy. Washington: U.S. Congress, Joint Economic Committee, U.S. Government Printing Office, July 10, 1975.

Greenslade, Rush V., and Robertson, Wade E. "Industrial Production in the USSR." Soviet Economic Prospects for the Seventies. Washington: U.S. Congress, Joint Economic Committee, U.S. Government Printing Office, June 27, 1973.

Holzman, Franklyn D. Foreign Trade Under Central Planning. Cambridge, Mass.: Harvard University Press, 1974.

Houthakker, Hendrik S. and Magee, Stephen P. "Income and Price Elasticities in World Trade." Review of Economics and Statistics, LI, No. 2 (May 1969), pp. 111-125.

International Monetary Fund. International Financial Statistics: 1972 Supplement. Washington: International Monetary Fund, 1972.

_____. International Financial Statistics. Washington: International Monetary Fund, XXVIII, No. 8 (August 1975).

Japan Ministry of Finance. Trade of Japan. Tokyo: Japan Tariff Association, Pt. 3, Vol. 1, 2, 1961, and Pt. 2, 1962.

Organization for Economic Cooperation and Development. Trade by Commodities, Market Summaries: Exports. Paris: OECD Publications Office, 1963, 1964.

Sources--Continued

Pravda. "Draft by CPSU Central Committee. The Main Directions in the Economic Development of the USSR for 1976-1980." Dec. 14, 1975.

United Nations. Standard Industrial Trade Classification, Revised. New York: United Nations Publishing Service, 1961.

_____. Commodity Indexes for the Standard Industrial Trade Classifications. New York: United Nations Publications, April 1953.

U.S. Department of Commerce. Bureau of East-West Trade Tapes.


A11600 793030