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THE STRENGTH OF U.S. MACHINERY EXPORTS IN 1975:
AN ANALYSIS OF PRICE COMPETITIVENESS AND SPECIAL DEMAND FACTORS

by

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The Strength of U.S. Machinery Exports in 1975: An Analysis of Price
Competitiveness and Special Demand Factors

U.S. merchandise exports increased in value by nearly 10 per cent in 1975, despite the decline in economic activity abroad. Machinery exports accounted for over half of this increase, expanding to a level of \$28.8 billion, or slightly more than one quarter of total merchandise exports. Machinery exports grew roughly 20 per cent in 1975, following a 40 per cent increase in 1974.

Most of last year's increase in machinery exports was reflected in higher prices, but the volume of shipments also increased, which is remarkable in view of the sharp drop-off in the volume of total world trade. This relative strength of U.S. machinery exports can be explained primarily by (1) several special factors which resulted in strong world demand for machinery relative to other goods in 1975, and (2) a substantial improvement since 1970 in the price competitiveness of the United States as a machinery exporting country. These underlying developments are discussed in Sections 1 and 2, respectively. In addition, roughly one-tenth of the expansion of machinery exports in 1975 reflects a rundown in the backlog of unfilled orders, which is discussed in Section 3. In Section 4 the growth of machinery export volumes and values is broken down by commodity groups and importing areas, and in Section 5 we consider the outlook for U.S. machinery exports in 1976.

*/ The views expressed herein are solely those of the authors and do not necessarily represent the views of the Federal Reserve System.

1. Special Factors Underlying the Relatively-Strong World Demand for Machinery in 1975

Trade data available for the first half of 1975 (at an annual rate) show that the volume of machinery exported by the world's three major suppliers (the United States, Germany, and Japan)^{1/} fell by 3 per cent from its level in 1974 as a whole, substantially less than the estimated 8 per cent drop in the volume of total world trade. One factor underlying the relative strength of world demand for machinery was the very large purchases of machinery by the OPEC countries, which experienced a boom in investment activity during 1975.

A second source of strength was the increased emphasis placed throughout the world on investment in the energy sector, which has contributed to relatively strong demands for power generating machinery and drilling and mining equipment. U.S. exports of these machinery items increased strongly last year, even to industrial countries, where total investment expenditures fell sharply. In addition, the boom in farm incomes during the past few years has stimulated demand for agricultural machinery. (The importance of agricultural and energy-related machinery in the growth of U.S. exports is described in Section 4 below.)

Finally, exports to non-OPEC developing countries were stronger than might have been expected in view of the estimated 6 per cent drop in their export earnings in 1975. Total U.S. exports to non-OPEC developing countries were 11.5 per cent greater in the first half of 1975 than in

^{1/} These three countries accounted for 55 per cent of the value of world machinery exports in 1973. Ranked by shares in world exports, the major machinery exporting countries in 1973 were Germany (24%), the United States (20%), Japan (11%), the United Kingdom (9%), France (8%), Italy (6%), the Netherlands (4%), and Canada (3%).

1974 as a whole. Machinery exports, which account for one quarter of total U.S. exports to these countries, rose by 17 per cent during the same period.

2. The Price Competitiveness of the United States as a Machinery Exporter

Foreign demand for U.S. machinery in recent years has also been stimulated by a substantial improvement in U.S. price competitiveness. Between 1970 and the first three quarters of 1975, German and Japanese export prices (in dollars) rose by 116 per cent and 52 per cent, respectively, compared with an increase of 40 per cent for the United States; see Table 1.^{2/} As a result, the price of U.S. machinery exports fell, relative to a weighted average of German and Japanese export prices, from an index level of 1.0 in 1970 to .73 the first three quarters of 1975. Most of this improvement in U.S. price competitiveness occurred between 1970 and 1973, however, reflecting the sharp depreciation of the dollar against the mark and the yen during that period. The ratio of U.S. to German and Japanese machinery export prices remained fairly constant between 1973 and the first half of 1975, and then rose sharply when the dollar appreciated in the third quarter of last year.

The aggregate relative price movements shown in Table 1 were evident in a broad range of machinery items; see Table 2. Much of the improvement in the U.S. relative price position, both in the aggregate and across individual machinery items, was due to the net depreciation of the

^{2/} Table 1 provides both the unit value index for U.S. machinery exports and a weighted average of disaggregated machinery export prices compiled by the Bureau of Labor Statistics. Although the latter index is based on data which cover only 55 per cent of U.S. machinery exports, the unit value index is felt to be a less accurate measure of price changes due to its failure to hold constant the commodity mix of the items whose prices are sampled. The German and Japanese export price data are not unit values, and are consistent with the BLS data.

Table 1: Price Indexes for Machinery Exports from the United States, Germany and Japan: 1970-1975
(1970 = 100)

Year	United States		Germany		Japan		Ratio of U.S. to German and Japanese Export ^b / _b Price Index (\$)
	Export Unit Value (\$)	Export Price Index (\$) ^a	Export Price Index (DM)	Export Price Index (\$)	Export Price Index (Yen)	Export Price Index (\$)	
1970	100.0	100.0	100.0	100.0	100.0	100.0	1.000
1971	102.7	101.0	107.7	113.0	98.4	104.4	.917
1972	105.0	101.6	112.5	129.7	92.1	112.1	.827
1973	108.2	105.8	118.3	162.9	95.8	130.4	.699
1974	124.3	119.0	130.5	184.3	118.4	149.8	.692
1975 ^c	152.4	139.5	142.6	215.6	125.2	152.2	.729
1975I	155.7	136.9	141.0	220.1	125.8	153.8	.702
II	166.3	139.5	142.9	221.2	125.0	153.1	.711
III	169.1	142.1	143.9	205.6	124.7	149.8	.776
IV	174.8	--	--	--	--	--	--

a/ Weighted average of BLS export price indexes for detailed machinery items, with weights proportional to 1973 export values. The items whose prices are included in this aggregate represented roughly 55 per cent of total U.S. machinery exports in 1973. Data for 1970-1974 are based on June price information, which is the only price information available prior to 1974. The June observations for export unit values are very close to the annual average unit values, which suggests that the errors introduced by substituting June data for annual export prices may be relatively small.

b/ Weighted average of export price indexes for Germany and Japan, with weights equal to export volume shares in each year.

c/ Average for the first three quarters of 1975.

Table 2: Dollar-Equivalent Price Indexes for Selected Categories of Machinery Exports
From the United States, Germany and Japan: 1970 - 1975

(1970 = 100)

<u>Year</u>	<u>United States</u>	<u>Germany</u>	<u>Japan</u>	<u>Year</u>	<u>United States</u>	<u>Germany</u>	<u>Japan</u>
<u>Internal Combustion Engines</u>				<u>Metal-Working Machinery</u>			
1970	100	100	100	1970	100	100	100
1971	105.3	111.3	106.3	1971	104.5	115.4	106.7
1972	106.7	127.3	120.7	1972	106.7	131.5	122.7
1973	107.8	161.3	138.3	1973	112.3	166.6	144.4
1974	124.0	179.8	154.0	1974	137.5	189.9	186.0
1975	148.7	220.7		1975	164.2	230.8	
<u>Agricultural Tilling Machinery</u>				<u>Pumps</u>			
1970	100	100	100	1970	100	100	100
1971	103.2	113.2	103.7	1971	103.9	111.6	104.6
1972	109.6	126.8	114.8	1972	104.5	125.3	120.5
1973	116.3	155.5	128.0	1973	110.6	155.2	156.3
1974	125.6	173.3	156.5	1974	118.4	177.4	179.0
1975	172.4	212.1		1975	155.7	216.2	
<u>Office Calculating Machines</u>				<u>Forklift Trucks</u>			
1970	100	100	100	1970	100	100	100
1971	96.5	107.4	83.4	1971	103.5	115.6	103.1
1972	97.0	111.4	56.6	1972	108.9	133.2	111.8
1973	98.5	134.1	49.1	1973	112.2	169.9	129.3
1974	97.6	139.2	43.4	1974	137.2	191.2	154.7
1975	101.8	151.0		1975	166.9	228.0	

Notes: The matching of items across countries within each of the 6 machinery categories is not exact. U.S. export price indexes are based on BLS transactions price data for June of each year, for SITC items 711.5, 712.1, 714.2, 715.1, 719.2 except 719.23, and 719.32, which respectively represented 7.0, 0.4, 3.6, 2.1, 3.9, and 0.9 per cent of U.S. machinery exports in 1973. German and Japanese data are annual averages of monthly export price indexes, except for the 1975 German indexes, which are based on June 1975 data. For more detailed information see the data source listing at the end of this note.

dollar.^{3/} But, relative rates of domestic-currency inflation and movements in home-currency measures of unit labor costs also favored U.S. exports, as shown in Table 3.

The impact of these relative price movements on U.S. exports is reflected in the changing U.S. share of combined U.S., German and Japanese machinery export volumes. Between 1970 and the first three quarters of 1975, the U.S. share in volume rose from 43 per cent to 49 per cent, as shown in Table 4. Japan's share rose from 17 to 20 per cent, while Germany's share fell from 40 to 32 per cent. There was little change in export value shares over the same period, however, because Germany's greater price increase offset its lesser volume increase.^{4/}

3. Changes in the Backlog of Unfilled Machinery Orders

Approximately one-tenth of last year's increase in machinery exports reflects a run-down in the backlog of unfilled orders, which had piled up rapidly during 1973 and 1974 when capital outlays abroad were strong and when domestic producers of machinery were experiencing capacity bottlenecks. At the end of 1974, unfilled export orders stood at 3.9 month's worth of export shipments, compared with an average ratio of 3.4 for the 1969-1972 period; see Table 5. During 1975 this ratio

^{3/} The 1975 figures in Table 2 are based on June data and do not reflect the dollar's appreciation in the second half of the year.

^{4/} 1975 data show a 21 per cent increase from 1974 in the value of new orders for U.S. machinery exports, and a decline in the dollar value of new orders for German machinery exports, which suggests that the United States will increase its value share in export shipments relative to Germany in 1976.

Table 3: Indexes of Unit Labor Costs in Both Local Currency Units and Dollars*
ex (1970 = 100)

Year	United States ULC(\$)	Germany		Japan	
		ULC(Marks)	ULC(\$)	ULC (Yen)	ULC(\$)
1970	100	100	100	100	100
1971	101.1	108.4	113.8	111.9	115.3
1972	106.2	113.9	130.4	119.6	141.4
1973	111.7	120.8	166.4	129.5	171.9
1974	127.8	135.0	190.7	168.5	207.8
1975	142.5	150.0	222.7	213.5	258.7

* Based on data provided by Michael Crosswell, "Unit Labor Costs in Manufacturing in Major Industrial Countries" memorandum to Mr. Siegman, Feb. 10, 1976. Crosswell's source is unpublished data provided by the Bureau of Labor Statistics. 1975 figures are based on data for January through September.

Table 4: Machinery Export Values, Volumes and Shares for the United States, Germany and Japan: 1970 - 1975

<u>Machinery Export Values (billions of \$)</u>				
<u>Year</u>	<u>U.S.</u>	<u>Germany</u>	<u>Japan</u>	<u>Total</u>
1970	11.37	10.57	4.39	26.33
1971	11.57	12.08	5.32	28.97
1972	13.25	14.58	6.81	34.64
1973	17.13	20.58	9.06	46.77
1974	23.69	26.12	11.79	61.60
1975 ^{a/}	27.72	27.77	12.17	67.66

<u>Machinery Export Volumes (billion of 1970 \$)^{b/}</u>				
	<u>U.S.</u>	<u>Germany</u>	<u>Japan</u>	<u>Total</u>
1970	11.37	10.57	4.39	26.33
1971	11.46	10.69	5.12	27.27
1972	13.04	11.33	6.08	30.45
1973	16.19	12.63	6.97	35.79
1974	19.91	14.17	7.86	41.94
1975 ^{a/}	19.87 ^{c/}	12.88	8.00	40.75

Country Shares in the Exports of the Three Countries Combined

<u>Year</u>	<u>Value Shares(%)</u>			<u>Volume Shares(%)</u>		
	<u>U.S.</u>	<u>Germany</u>	<u>Japan</u>	<u>U.S.</u>	<u>Germany</u>	<u>Japan</u>
1970	43.2	40.1	16.7	43.2	40.1	16.7
1971	39.9	41.7	18.4	42.0	39.2	18.8
1972	38.3	42.1	19.7	42.8	37.2	20.0
1973	36.6	44.0	19.4	45.2	35.3	19.5
1974	38.5	42.4	19.1	47.5	33.8	18.7
1975 ^{a/}	41.0	41.0	18.0	48.8	31.6	19.6

^{a/} Data for the first three quarters of 1975 at annual rates.

^{b/} Constructed using export price indexes from Table 1 as deflators.

^{c/} U.S. data available for 1975 as a whole indicate an export volume of 20.65 billion (1970 dollars) when export value is deflated by the June export price index. Complete 1975 data are not yet available for Germany and Japan.

Table 5: New Orders, Unfilled Orders and Shipments of U.S. Machinery: 1969-1975
(billions of dollars)

	<u>Export Orders</u>										
	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
New Orders	8.8	10.1	10.1	11.5	15.4	21.2	25.6	23.8	24.2	26.6	27.6
Unfilled Orders (end of period)	2.5	2.7	3.1	2.9	4.6	6.3	5.9	6.5	6.2	5.9	5.9
Shipments	8.5	10.0	9.7	11.6	13.7	19.5	26.1	23.1	25.3	27.6	28.2
Ratio of Unfilled Orders to Shipments (monthly) <u>a/</u>	3.60	3.24	3.72	3.00	4.08	3.85	2.76	3.34	2.94	2.57	2.50
<u>Domestic Orders</u>											
New Orders	97.9	92.8	94.7	109.5	132.4	140.5	121.7	115.8	122.6	123.8	124.8
Unfilled Orders (end of period)	25.8	24.0	23.6	27.7	37.1	43.9	38.5	41.1	39.8	39.4	38.5
Shipments	96.2	94.5	95.1	105.4	123.2	133.8	128.1	126.8	128.1	125.5	130.8
Ratio of Unfilled Orders to Shipments (monthly) <u>a/</u>	3.24	3.00	3.00	3.12	3.60	3.96	3.60	3.89	3.73	3.77	3.53
<u>Total Orders</u>											
New Orders	106.7	102.9	104.8	121.0	147.8	161.7	147.3	139.6	146.8	150.4	152.4
Unfilled Orders (end of period)	28.3	26.7	26.7	30.6	41.7	50.2	44.4	47.6	46.0	45.3	44.4
Shipments	104.7	104.5	104.8	117.0	136.9	153.3	153.8	149.9	153.4	153.1	159.0
Ratio of Unfilled Orders to Shipments (monthly) <u>a/</u>	3.24	3.12	3.00	3.12	3.60	3.96	3.46	3.81	3.60	3.55	3.35

a/ Ratio of unfilled orders (end of period) to shipments (monthly rate). This ratio indicates the number of months worth of shipments (at current rate) in the unfilled orders backlog.

b/ Quarterly data are seasonally adjusted annual rates.

fell sharply to 2.5 at the end of the fourth quarter, reflecting both the gradual decline in unfilled orders and the strong growth of shipments.

The major factor contributing to last year's decline in unfilled export orders was the recession in domestic investment expenditure, which relieved the strains on productive capacity in the machinery sector. While foreign orders continued to rise, reflecting the developments outlined in Sections 1 and 2 above, new domestic orders for machinery dropped substantially. The backlog of unfilled domestic orders was run down along with the backlog of unfilled export orders, but not rapidly enough to prevent a decline in production for domestic customers. As a result, the industrial production index for machinery fell by 17 per cent from its peak in the third quarter of 1974 to its trough in the second quarter of 1975, before beginning to pick up slowly in the second half of last year.

This stimulus to production for exports is likely to be short-lived, however, primarily because technological considerations impose a limit on the minimal time lag between the receipt of new orders and the availability of output produced to order. The backlog of unfilled export orders was still declining month-to-month at the end of 1975, but this backlog had been worked down to only 2.5 month's worth of export shipments (or 2.6 month's worth of new export orders), 26 per cent below the average ratio of 3.4 for the 1969-1972 period.

4. The Composition of the Growth of U.S. Machinery Exports during 1975

Data available for the first three quarters of 1975 indicate that exports of electric machinery were 8 per cent greater in value in this period than during the first nine months of 1974, while exports of non-electric machinery were 29 per cent greater. A complete breakdown of non-electric machinery into 3-digit subgroups is shown in Table 6. The second column shows that roughly 70 per cent of the change in the value of non-electric machinery exports occurred in power generating machinery (SITC 711), agricultural machinery (SITC 712) and construction, excavating, and mining machinery (category "***", a major sub-group of SITC groups 718 and 719).

Table 6 also shows volume data, which have been constructed by deflating the January-September value data with appropriate BLS export price indexes for June (1974 and 1975). Roughly 30 per cent of the growth in non-electric machinery exports in 1975 was due to higher volumes. Agricultural machinery, metal working machinery, and construction, excavating, and mining machinery show volume growths of about 30 per cent and price rises of approximately 20 per cent, while power generating machinery shows 5 per cent volume growth and 20 per cent price expansion.

The three major growth categories, as well as the totals for non-electric and electric machinery, are broken down by area in Table 7. Over half of the increase in non-electric machinery exports was shipped to developing areas. This increase was split fairly evenly between OPEC and non-OPEC countries, with Latin America accounting for nearly 60 per cent of the additional non-OPEC purchases. Forty per cent of the increased shipments to developing countries were exports of con-

Table 6: Changes in U.S. Exports of Selected Categories of Machinery,
by Value and Volume: 1974-1975

SITC and Commodity Group	1975 Value	Change in Value 1974 to 1975	Percentage Changes from 1974	
			Value	Volume
71 Nonelectric Machinery, Total	20,557	4,640	29	20
711 Power Generating Machinery	3,471	713	26	20
712 Agricultural Machinery	2,072	739	55	19
714 Office Machines	2,604	-13	-0.5	4
715 Metalworking Machinery	889	307	53	19
717 Textile and Leather Machinery	491	-29	-6	--
718 Machines for Special Industries	3,592	1,228	52	24
719 Machinery Not Elsewhere Classified	7,439	1,696	30	--
*** Construction, Excavating and Mining Machinery	4,657	1,749	60	24
72 Electric Machinery, Total	7,427	551	8	6

NOTES: Data for both 1974 and 1975 are for January through September, at annual rates.
Values are in millions of dollars; volumes are constructed using export price indexes for
June (1974 and 1975) as deflators.

The three-digit breakdown of SITC 71 is exhaustive; groups 713 and 715 are not defined.
Group "***" consists of several subcategories of SITC groups 718 and 719.

Table 7: Changes in the Value of U.S. Machinery Exports to Selected Importing Areas

	<u>Importing Areas</u>				<u>Developing Areas</u>				
	<u>Industrialized Areas</u>				<u>OPEC</u>	<u>Non-OPEC</u>			
	<u>All Areas</u>	<u>OECD Europe</u>	<u>Canada</u>	<u>Japan</u>		<u>Latin America</u>	<u>Africa</u>	<u>Asia</u>	
71 Nonelectric Machinery, Total									
1975	20,801	5,618	4,800	854	8,042	2,604	2,887	811	1,740
Change, 1974 to 1975	4,132	751	870	-91	2,318	1,231	619	249	219
% Change, 1975/1974	24.8	15.4	22.1	-9.7	40.5	89.7	27.3	44.3	14.4
711 Power Generating Machinery									
1975	3,506	1,011	1,010	183	1,051	254	387	93	317
Change, 1974 to 1975	623	193	181	-9	248	89	74	23	62
% Change, 1975/1974	21.6	23.6	21.8	-4.5	30.9	53.9	23.6	32.9	24.3
712 Agricultural Machinery									
1975	2,162	243	890	24	837	274	358	120	85
Change, 1974 to 1975	764	63	301	-6	340	177	132	48	-17
% Change, 1975/1974	54.6	35.2	51.1	-20.0	68.4	182.5	58.4	66.7	-16.7
*** Construction, Excavating and Mining Equipment									
1975	4,665	886	886	105	2,410				
Change, 1974 to 1975	1,552	325	216	45	924				
% Change, 1975/1974	49.8	48.6	32.3	74.3	62.2				
72 Electric Machinery, Total									
1975	7,452	2,229	1,291	413	3,233	715	1,212	202	1,104
Change, 1974 to 1975	433	136	-42	-83	395	295	44	65	-9
% Change, 1975/1974	6.2	6.5	-3.2	-16.7	13.9	70.2	3.8	47.4	-0.8

NOTES: 1975 data are for Jan.-July, at annual rates; 1974 data are for Jan.-Dec. Values are measured in millions of U.S. dollars.

data not available

struction, excavating and mining equipment; but developing countries also increased substantially their purchases of power generating equipment and agricultural machinery.

Exports to industrial areas expanded most strongly in construction, excavation, and mining equipment, though Canadian purchases of agricultural machinery also rose sharply. Despite receding investment expenditures in foreign industrial countries, the only area to reduce its purchases of U.S. machinery was Japan. The strength of exports to other industrial areas can be explained in part by the increased priority being given to investments in energy production and conservation, and in part by the relatively long delivery lags (as much as a year or more) on some orders for machinery. Part of last year's shipments reflected orders that had been placed in 1974 -- and possibly even earlier -- when capital outlays abroad had been considerably stronger than they were in 1975, and when the industries accepting these orders had been experiencing production bottlenecks.

5. The Outlook for U.S. Machinery Exports in 1976

Despite the upturns in economic activity abroad, we foresee a slowdown in the growth of U.S. machinery exports in 1976. Five factors underlie this outlook.

First, both the volume and value of new export orders for machinery have remained fairly stable since last June, probably reflecting the decline in investment expenditures in foreign industrial countries in 1975. The flattening of these orders suggests little

growth in machinery exports for several months to come; in fact, export shipments actually may decline if the gradual rundown in unfilled orders is halted.

Second, while industrial production is expected to pick up abroad, recent investment intention surveys predict that capital outlays in most foreign industrial countries will continue to decline, though not as steeply as last year.

Third, the OPEC countries as a group may be approaching the limits of their physical and financial abilities to absorb further large increases in imports, and mounting financial problems probably will lead non-OPEC developing countries to curtail their imports.

Fourth, while U.S. price competitiveness is still strong relative to its position six years ago, U.S. machinery export prices are no longer declining relative to foreign prices. The long-run improvement in the U.S. competitive position may continue to stimulate the volume of U.S. machinery exports, though the more recent deterioration in price competitiveness could eventually offset such gains.

Finally, with the recent and projected slowing of inflation in the United States, price increases will be less important in stimulating the value of machinery exports than they were in 1975.

Data Sources

1. Export Price Indexes

(a) U.S. export price indexes for 4 and 5-digit SITC categories of machinery are taken from quarterly news releases by the Division of International Prices of the Bureau of Labor Statistics, U.S. Department of Labor. These data, which cover roughly 55 per cent of U.S. machinery exports, are available for June of each year since 1970, and for March, June, September and December since 1974. Our aggregate price index for U.S. machinery exports is a weighted average of those price indexes which are available since 1970 for mutually-exclusive 4 or 5-digit SITC categories, with weights equal to shares in the value of 1973 exports.

(b) German export price indexes are taken from Preise Löhne Wirtschaftsrechnungen Reihe 1: Preise and Preisindices für Aussenhandelsgüter (Statistisches Bundesamt Weisbaden, 1974 annual and 1975 monthly editions)

(c) Japanese export prices indexes are taken from Price Indexes Annual (Bank of Japan, 1974 edition) and Economic Statistics Monthly (Bank of Japan, November 1975).

The machinery categories whose prices are described in Table 2 have the following representations in the U.S., German and Japanese data.

1.) U.S.: Internal Combustion Engines Other Than for Aircraft (SITC 711.5); Germany, Internal Combustion Engines for Motor Vehicles and Motorcycles (Verbrennungsmotoren für

Kraftwagen und Krafträder["]); Japan: Engines (Internal Combustion)

2.) U.S.: Agricultural Machinery and Appliances for Preparing and Cultivating the Soil (SITC 712.1); Germany: Soil Tilling Equipment (Ackerschlepper); Japan: Agricultural Machinery: Power Tiller

3.) U.S.: Calculating Machines, Accounting Machines and Similar Machines Incorporating a Calculating Device (SITC 714.2); Germany: Adding and Calculating and Accounting Machines (Rechen and Buchungsmaschinen); Japan: Electronic Calculating Machines, Table Type

4.) U.S.: Machine Tools for Working Metals (SITC 715.1); Germany: Metalworking Machinery (Metallbearbeitungsmaschinen); Japan: Metalworking Machinery

5.) U.S.: Pumps, Excluding Centrifuges (SITC 719.2 excl. 719.23); Germany: Pumps and Compression Equipment (Pumpen and Druckluftgeräte und dgl.); Japan: Pumps and Similar Products

6.) U.S.: Forklift Trucks (SITC 719.32); Germany: Cranes and Lifting Gear (Krane und Hebezeuge); Japan: Forklift Trucks.

2. Export Value Data

(a) U.S. machinery export values (and unit values) are taken from Survey of Current Business, (various issues), and data obtained directly from the Bureau of International Commerce.

(b) German and Japanese Machinery export value data (SITC #71 and #72) for 1970-1974 are taken from OECD Statistics of Foreign

Trade, Trade by Commodities Country Summaries, (OECD, Series B, annual Jan.-Dec. 1973-74).

(c) German and Japanese machinery export value updates for 1975 are from national sources:

-- Aussenhandel, Reihel, Zusammenfassende Übersichten (Statistisches Bundesamt, Wiesbaden, October 1975), and

-- Economic Statistics Monthly (Bank of Japan, November 1975).

(d) World trade data are from International Financial Statistics (IMF, January 1976).

3. Exchange rate data are from Federal Reserve Bulletin (FRB, various issues 1971-1975).

4. U.S. machinery orders data are from the Survey of Current Business (various issues) for total orders, and from "Manufacturers' Export Sales and Orders of Durable Goods," Bureau of the Census, Department of Commerce (monthly) for export orders.