

MARYLAND INTERINDUSTRY FORECASTING PROJECT

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DERIVATION OF BASE-YEAR EXPORT AND IMPORT VECTORS

by

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Each year when we balance the input-output matrix to the most recent row and column controls, we need export and import vectors (see Table 1). The Census Bureau collects an enormous quantity of data on imports and exports. Here we will explain how this data is incorporated into the model and reconcile our import and export totals with those found in the National Accounts in the Survey of Current Business.

Commodity Exports

The export column of the input-output table shows the value of exports in producer prices for each I-O product sector. The basic source of this data is the Census publication FT 610, U.S. Exports of Domestic Merchandise. However, FT 610 has one grand total, followed by page after page of very detailed commodity classifications. U.S. Commodity Exports and Imports as Related to Output, which is prepared by the Census Bureau, would be an ideal source. Unfortunately, this publication is not sufficiently up-to-date. We were able to overcome these problems by borrowing a listing from the Census Bureau which summarized the export data in FT 610 at the two-, three-, and four-digit SIC level. We encounter two problems in using this source. In the first place, FT 610 classifies products by a scheme that is somewhat different from the SIC codes on which the I-O table is based. Secondly, because FT 610 gives the value of exports at domestic port prices, the charges for transportation and wholesale trade must be stripped off to obtain the value of exports in producer prices. These charges appear as exports of transportation and wholesale trade.

The Classification Problem

The most up-to-date and detailed source of export data is FT 610. Although its classification scheme is based on the SIC, it differs from the SIC in a number of places. With one exception, tobacco, these items are small relative to domestic use, so we have left them where they were shown in FT 610.

We made a special calculation for stemmed and redried tobacco, which is a manufactured product by the SIC code but an agricultural product in FT 610. We divided this category between manufactured and non-manufactured tobacco as defined by the Department of Agriculture in their input-output work. About 90 percent of exported tobacco is manufactured. (See attached Table 2.)

Conversion to Producer Prices

We obtained exports in producer prices by applying transportation and wholesale trade margin ratios to the exports in domestic port prices for each I-O sector. The 1958 matrix provided the port prices and corresponding margins for transportation and wholesale trade. These margins were stripped off the domestic port price to obtain exports in producer prices. The charges for transportation and trade were aggregated over the I-O sectors and appear as exports of the transportation and trade sectors, respectively. (Table 1 of the special appendix on exports and imports, available from the central master file, gives the export margin ratios.)

Commodity Imports

In the input-output table, we divide imports into three categories. Imports that are part of personal consumption expenditures

are classified as consumption imports. Bananas, Christmas trees, and apparel are examples of consumption imports. We define an import as competitive with a domestic product if this country produces more of the product than it imports. Accordingly, aluminum is a competitive commodity. Non-competitive imports, such as coffee beans, are allocated to the using industry.

The Census publication FT 210, U.S. Imports for Consumption and General Imports, is the basic source for the import data. Again, because this publication contains no subtotals, we borrowed a Census listing which showed the two-, three-, and four-digit summary levels of imports. There are classification problems because of the coding scheme. To include duty, freight, and insurance charges, the value of imports must be converted from foreign port prices to domestic port prices.

Non-Competitive and Consumption Imports

As a guide to the identification of the non-competitive and consumption imports, we used an OBE worksheet which showed the direct allocation of imports for 1958. Since this list seemed to be somewhat incomplete, we reviewed the list of imports to identify those commodities which should be allocated to consumption. In cases where a commodity was used for other purposes in addition to consumption, an estimate was made, on a judgment basis, of the portion of the product that is purchased directly by consumers.

The import row entries for non-competitive imports are determined by the buyer of the commodity. For example, coffee beans are classified in FT 210 as an imported crop, but in the I-0 table,

we must place coffee beans under the sector that processes coffee, miscellaneous food. (Table 2 of the special appendix gives the allocation of imports among competitive, non-competitive, and consumption imports.)

Conversion to Domestic Port Prices

FT 210 gives imports at foreign port prices. However, in the model, imports appear in domestic port prices. From the work of Mr. Joseph Cangialosi at OBE, we obtained ratios of duty, freight, and insurance charges to the foreign port value by two-digit commodities. Since Mr. Cangialosi worked only with competitive imports, ratios for the other commodities were estimated from the competitive ratios. However, for some of the consumption and non-competitive imports, it was possible to obtain margin ratios from the OBE worksheet which showed direct allocations for 1958. (Table 3 of the special appendix gives the import margins.)

Classification Problem

Although the classification scheme for imports in FT 210 is based on the SIC, it differs from the SIC in several places. The differences are small relative to total imports. In a few cases for which it was possible, we transferred commodities to their correct categories.

Passenger Travel

Exports and imports of passenger travel can be obtained from the U.S. Statistical Abstract. Table 866 (1968) shows the receipts and payments for international travel.

Receipts, passenger fares, of U.S. lines, 1967
(Export of Transportation)

Ocean Transportation	8
Air Transportation	363

Payments to foreign lines, 1967
(Import of Business Travel and Consumption)

Ocean Transportation	189
Air Transportation	604

Mr. Cangialosi of OBE estimates that 12 percent of these passenger fares represents business travel. The remainder was assigned as an import to consumption.

Reconciliation with the National Accounts

Our totals for exports and imports do not agree with the National Accounts for several reasons. We do not include the exports and imports of waste and scrap, used merchandise, or commodities which are not classified by kind in FT 210 and FT 610 because we have no means of assigning these goods to an I-O sector. We do not include the imports or exports of financial services. Exports are given in producer prices; imports are given in domestic port prices. Table 3 gives a complete reconciliation of our totals with the National Accounts.

Table 1

EXPORTS AND IMPORTS, 1967

I-0 Sector	Millions of Dollars		
	Competitive Imports	Non-Competitive Imports	Exports
1 Cotton	30.2		387.6
2 Grains	20.8		2498.5
3 Tobacco	187.2		24.2
4 Fruits, vegetables, other crops	71.8		294.4
6 Poultry, eggs	9.8		5.8
7 Meat & other livestock products	325.5		63.7
8 Forestry	---		21.4
9 Fisheries	33.3		7.9
10 Agricultural services		1.6	23.4
11 Iron ore	687.4		100.5
12 Copper ore	29.7		21.9
13 Other metal	291.8		10.1
14 Coal mining	2.3		296.7
15 Petroleum & natural gas	1529.5		112.7
16 Stone, clay, & chemical mining	567.7		207.4
19 Guided missiles	---		30.7
20 Ammunition	43.9		108.7
21 Other ordnance	49.2		180.6
22 Meat except poultry	62.2		236.8
23 Poultry packing			41.1
24 Dairy products			104.0
25 Canned & frozen foods			237.5
26 Grain mill products	24.0		497.5
27 Bakery			5.9
28 Sugar	269.8		6.9
29 Confectionary products	27.0	277.4	18.5
30 Beer & malt	6.5		5.0
31 Wines & brandy			.9
32 Distilled liquors			12.9
33 Soft drinks & flavoring			34.0
34 Fats & oils	106.3		541.9
35 Misc. food products		1139.9	67.4
36 Tobacco products		18.4	569.3
37 Carpets & rugs			17.6
38 Fabrics & yarn	864.8	52.9	243.2
39 Apparel	29.9		127.4
40 Household textiles			83.7
41 Lumber	522.2		306.5
42 Veneer & plywood	241.0		16.0

Table 1
(continued)

I-0 Sector	Millions of Dollars		
	Competitive Imports	Non-Competitive Imports	Exports
43 Millwork & wood products	126.7		27.2
44 Wooden containers	2.6		3.1
45 Household furniture			19.0
46 Office furniture			18.3
47 Pulp	414.1		222.4
48 Paper & board mills	965.2		318.0
49 Converted paper products	31.5		78.5
50 Corrugated boxes			4.3
51 Other paper products	2.1		14.6
52 Newspapers			2.6
53 Books, periodicals, misc. publishing			197.3
54 Other printing & services	29.1		57.0
55 Alkalines & chlorine	6.9		31.2
56 Industrial gases			3.5
57 Coal tars, cyclic inter- mediates & dyes	133.2		155.7
58 Pigments & other organic chemicals	220.3		357.1
59 Industrial organic chemicals	147.8		454.6
60 Plastic materials	35.5		409.1
61 Synthetic rubber	23.5		155.4
62 Cellulosic fibers	28.0		17.5
63 Non-cellulosic fibers	60.4		95.9
64 Drugs	118.4		303.9
65 Cleaning & toilet preparations	9.0		113.1
66 Paints	.7		38.8
67 Fertilizers	40.6		121.6
68 Pesticides & other agric. chemicals	18.3		64.1
69 Explosives	24.9		9.2
70 Misc. chemicals	91.5	33.4	279.3
71 Gasoline	4.1		6.7
72 Aviation fuel	112.4		9.4
73 Fuel oil, kerosene	509.9		195.6
74 Lubricants	.4		43.9
75 Other petroleum products	173.7		158.4
76 Tires	44.8	105.6	69.1
77 Rubber products	16.0	104.3	96.0
78 Plastic products	108.0		84.8
79 Luggage			4.5
80 Footwear & leather	98.2	22.8	56.3
81 Glass	135.9		119.3
82 Structural clay products	19.8		25.9

Table 1
(continued)

I-0 Sector	Millions of Dollars		
	Competitive Imports	Non-Competitive Imports	Exports
83 Pottery	85.7		19.5
84 Concrete, plaster products, cement	23.3		10.1
85 Non-metallic mineral & stone products	95.3	26.8	109.2
86 Steel	1601.7		507.7
87 Copper	661.7		167.8
88 Aluminum	261.5		164.3
89 Zinc	70.5		4.2
90 Other non-ferrous metals	767.7	32.8	190.2
91 Metal cans			11.6
92 Cutlery, hardware	79.6		128.4
93 Plumbing & heating	2.9		51.0
94 Structural metal products	31.3		219.8
95 Screws, bolts, nuts, rivets	79.1		51.5
96 Metal stampings	17.4		200.3
97 Valves, pipe fittings, fabricated pipe	47.7		165.6
98 Wire products	71.2		26.6
99 Other metal products	168.5		82.6
100 Engines & turbines	88.0		418.2
101 Farm machinery	328.5		398.0
102 Construction, mining, oil field machinery	95.6		1238.8
103 Material handling machinery	24.6		122.7
104 Metalworking machinery	315.3	31.7	475.1
105 Special industry machinery	325.2		756.0
106 Pumps	45.4		297.3
107 Bearings	68.5		74.9
108 Power transmission equipment	16.7		97.0
109 Other general industrial machinery	178.9		105.3
110 Computers & accounting machines	242.5		38.6
111 Other office machinery	2.5		672.9
112 Service industry machinery	15.6		332.4
113 Misc. machinery			13.5
114 Electric measuring instruments	50.9		150.7
115 Transformers & switchgear	95.8		98.0
116 Motors & generators	62.8		150.3
117 Electrical industrial controls			37.6
118 Welding apparatus & graphite products	33.2		73.9
119 Household appliances	42.7		152.0

Table 1
(continued)

I-O Sector	Millions of Dollars		
	Competitive Imports	Non-Competitive Imports	Exports
120	Lighting & wiring devices	64.0	172.3
121	Radio & TV receiving	596.7	95.0
122	Communication equipment	187.5	406.5
123	Electronic components	160.7	279.7
124	Batteries	8.0	15.0
125	X-ray apparatus	10.7	9.7
126	Engine electrical equipment	125.4	137.7
127	Passenger cars	2040.9	719.9
128	Trucks & busses	812.1	1428.9
129	Aircraft & parts, military	75.1	457.8
130	Aircraft & parts, civilian	207.8	1177.3
131	Aircraft engines & parts	40.6	310.9
132	Ship & boat building	10.7	72.2
133	Railroad equipment	6.1	131.0
134	Cycles & trailers	224.7	27.8
135	Scientific instruments	44.3	140.7
136	Mechanical measuring devices	22.0	249.3
137	Optical & ophthalmic products	115.4	40.4
138	Medical & surgical instruments	26.1	112.0
139	Photographic equipment	73.6	271.7
140	Watches & clocks	8.8	10.1
141	Jewelry & silverware	93.3	21.7
142	Toys, sporting goods, musical instruments	38.9	84.3
143	Office supplies	13.3	37.2
144	Misc. manufacturing	149.4	4.7
145	Railroads		676.0
147	Trucking		633.0
148	Water transportation		35.0
149	Air transportation		377.0
156	Wholesale trade		2266.0
172	Business travel		95.0
	TOTAL	2104.1	2164.0
			30467.0

Table 1
(continued)

CONSUMPTION IMPORTS, 1967

Millions of Dollars

1	Meat	766.5
2	Poultry	5.1
3	Dairy	83.2
4	Processed fruits & vegetables	218.2
5	Seafood	576.4
6	Grain mill products	17.8
7	Bakery products	23.2
8	Sugar & confection	459.0
9	Beer & wine	147.7
10	Fats & oils	2.3
11	Tobacco	8.9
12	Footwear	299.3
13	Clothes	1072.4
14	Jewelry & watches	236.0
16	Toilet articles	14.4
18	Housing, except farm	25.9
20	Furniture	93.7
21	Appliances	111.4
22	China & glassware	75.0
23	Knives, forks, spoons, & other silver	24.5
25	Rugs	61.4
26	Misc. durable household furnishings	58.8
27	Semi-durable household furnishings	2.8
30	Writing supplies	.8
38	Drugs & sundries	5.2
52	Tires & tubes	53.2
55	Gasoline & oil	405.3
59	Intercity transportation	698.0
60	Books & maps	141.7
61	Magazines & newspapers	11.2
62	Non-durable toys	147.8
63	Durable sports equipment	171.7
64	Radio & phonographs	7.3
65	Musical instruments	25.9
67	Flowers, seeds, potted plants	5.1
70	Other recreation	1.6
76	Coffee, tea, spices	170.0
77	Soft drinks & misc. food	123.4
79	Fresh fruits & veg.	324.7
80	Distilled alcoholic beverages	505.6
	TOTAL	7182.0

Table 2

DIVISION OF TOBACCO EXPORTS
BETWEEN MANUFACTURED AND AGRICULTURAL EXPORTS, 1967

Source: FT 610 (1967) 01140E, was divided between manufactured and non-manufactured tobacco on the basis of conversation with the tobacco section of the Department of Agriculture.

	<u>1967 Exports</u> <u>(in \$ thousands)</u>
MANUFACTURED TOBACCO	
Flue-cured leaf tobacco	402987.6
Burley leaf tobacco	39069.9
Maryland leaf tobacco	12274.9
Perique leaf tobacco	151.5
Black fat leaf tobacco	<u>3373.9</u>
TOTAL	457857.8
NON-MANUFACTURED TOBACCO	
Dark fired Kentucky & Tennessee leaf tobacco	11558.9
Virginia fire-cured & sun-cured tobacco	3126.8
Green River leaf tobacco	502.7
One-sucker leaf tobacco	428.1
Cigar wrapper Connecticut shade leaf tobacco	10172.8
Cigar wrapper Georgia & Florida shade leaf tobacco	1137.7
Cigar binder Connecticut valley leaf tobacco	1530.2
Wisconsin & other cigar binder type leaf tobacco	86.8
Cigar filler leaf tobacco	<u>518.5</u>
TOTAL	29062.5

Table 3

RECONCILIATION WITH THE NATIONAL ACCOUNTS

Adjustments from SCB, June 1968, "U.S. Balance of Payments"

	<u>Millions of Dollars</u>
Total exports, producer prices, 1967 (in the forecasting model)	30467
Less passenger fares (<u>U.S. Statistical Abstract</u> , 1968, Table No. 866)	- 371
Plus exports of waste and scrap, used, rebuilt or second-hand merchandise, and commodities not classified by kind (FT 610)	1051
Plus re-exports (U.S.S.A., 1968, Table No. 1213)	<u>387</u>
Equals: Merchandise exports, Census basis (Table 4, line 5)	30468 31534
Less military grant shipments recorded in Census data	- 592
Plus net adjustments (T.4, 1.2-4)	<u>474</u>
Equals: Merchandise exports, adjusted (T.1, 1.3)	30468
Plus transfers under military sales contracts (T.1, 1.4)	1240
Plus transportation (T.1, 1.6)	2701
Plus travel (T.1, 1.7)	1646
Plus fees & royalties from direct investments (T.1, 1.8)	1140
Plus other private services (T.1, 1.9)	1367
Plus other U.S. Government services (T.1, 1.10)	336
Plus income on U.S. investments abroad (T.1, 1.11-13)	<u>6859</u>
Equals: Exports of goods & services (excluding transfers under military grants) (T.1, 1.2)	45756
Total imports, domestic port prices, 1967 (in the forecasting model)	30387
Less freight, duty, insurance charges	- 4125
Equals: Imports, foreign port prices	<u>26262</u>
Less passenger fares	- 793
Plus difference between general imports and imports for consumption	83
Plus imports of scrap and waste, used automobiles, used tractors, used tires, used rifles, goods returned and re-imported, and commodities not classified by kind	<u>1263</u>
Equals: Merchandise imports, Census basis (general imports) (T.4, 1.15)	26816
Plus net adjustments (T.4, 1.12-14)	<u>175</u>

Table 3
(continued)

	<u>Millions of Dollars</u>
Equals: Merchandise imports, adjusted (T.1, 1.15)	26991
Plus military expenditures (T.1, 1.16)	4340
Plus transportation (T.1, 1.17)	2982
Plus travel (T.1, 1.18)	3195
Plus private payments for other services (T.1, 1.19)	501
Plus U.S. payments for other services (T.1, 1.20)	688
Plus income on foreign investments in U.S. (T.1, 1.21,22)	<u>2293</u>
Equals: Imports of goods and services (T.1, 1.14)	40989