

MARYLAND INTERINDUSTRY FORECASTING PROJECT

Research Memorandum No. 11

ALLOCATION OF PRODUCER DURABLE EQUIPMENT TO PURCHASERS FOR 1966

The Maryland Interindustry Model includes an equipment flow matrix. This matrix shows the amount of equipment that each sector sells to every other on capital account. Every year this matrix must be balanced and brought up to date by using the latest figures for the row and column controls. The row controls are the total amounts each sector sells. The column controls are total amounts purchases by each sector. Naturally, the sums of the row and column controls must be equal.

Few problems are encountered in obtaining the row totals; procedures for doing so will be the subject of a subsequent report. The difficulties in finding the column totals are the subject of this report.

The data sources to which we first turned were the Annual Survey of Manufactures, the OBE survey on New Plant and Equipment Purchases published in the Survey of Current Business, the National Account table on construction expenditures, and the USDA figures on farm investment. The total from these sources fell 5 billion dollars, or ten percent, short of total Purchases of New Producer Durable Equipment as given in the national accounts. First, let us see how these sources can be used to make allocations by purchaser; then we shall track down the missing billions. The allocations are shown in the attached table; we shall explain item by item.

(1) Expenditures on new equipment by public utilities are estimated by subtracting construction expenditures on electric utilities and petroleum pipelines from plant and equipment expenditures of public utilities.

(2) The entire plant and equipment expenditure of the mining industry estimates the equipment expenditure.

(3) Construction by the telephone and telegraph industries is subtracted from plant and equipment expenditures of the communications industry.

(4) Railroad construction expenditures are subtracted from railroad plant and equipment expenditures.

(5) The entire plant and equipment expenditures of other transportation industries are used to estimate their equipment expenditures.

(6) The OBE category Commercial and Other Industries includes the trade, service, finance, and construction industries. Commercial construction is subtracted from the plant and equipment figures to estimate the new equipment expenditure.

(7) New equipment purchases by the petroleum extraction industry are also estimated with the aid of the OBE plant and equipment survey but not in such a direct manner as the above industries. The OBE plant and equipment survey classifies the petroleum industry as a component of the manufacturing industries. However, only a part of the petroleum industry should be classified as a manufacturer, namely, the petroleum refining industry which manufactures petroleum products.

Therefore, the non-manufacturing petroleum extraction industry is listed separately in the attached table. Its purchase of new PDE is estimated by subtracting from the plant and equipment expenditures of the entire petroleum industry that plant and equipment purchased by the petroleum refining industry and one-third the expenditures on petroleum and natural gas well drilling and exploration. The other two-thirds of drilling are not capitalized, but counted as operating expense.

(8) Equipment investment by manufacturing establishments is taken from the Annual Survey of Manufactures.

(9) Besides the petroleum extraction industry, there are other non-manufacturing establishments owned by manufacturing companies and therefore included in the OBE Survey category Manufacturing. Our model is geared to the establishment definition of sectors and therefore must use the establishment-based investment figures whose total appears in item 8 above. In the OBE Survey, the Manufacturing-less-petroleum category is \$3.23 billion in excess of the same category from the Annual Survey of Manufactures. We shall consider these purchases to be made by Trade; since we have already subtracted the full value of store and warehouse construction in item 6, the full \$3.23 billion should be added to equipment purchases by Trade.

(10) Equipment purchases by Agriculture were estimated with figures reported in the Farm Income Situation. Amounts spent for dwellings and land improvements were subtracted from gross capital expenditures.

(11) A share of personally-owned cars which are used also for business purposes is included in PDE. Naturally, these cars are not included in the capital expenditures reported to the OBE surveys. In order to estimate this addition, we need to understand how the sales of cars to PDE is estimated. Principally on the basis of highway surveys and family interviews conducted by the Michigan Research Center, OBE ascertained that 22 percent of passenger cars was for business use. Other sources indicated that every year one-third of business passenger cars were traded in, and in this way PDE was transferred to PCE. When this last item is subtracted from new PDE purchases, the net purchases of new passenger cars by business is 15 percent ($2/3 \times 22$ percent) of the total sold.

From this estimate of passenger cars used as PDE, the adjustment for PDE passenger cars not included in the OBE Survey can be calculated.

Total PDE Passenger Cars	4.39
Amount Reported by Business	<u>.90</u>
	3.49
Less cars to agriculture in item 10	<u>.42</u>
Passenger cars excluded from OBE Survey	3.07

The amount reported to OBE is based on the 1957 and 1958 plant and equipment surveys. In those two years, business was asked to report their net purchases of passenger cars. The same ratio of the amount reported to the amount produced is used every year. Estimates of automobile purchases by agriculture are given in the source cited for item 10.

(12) Another half billion dollars, not included in the OBE Survey, is spent by professionals for their equipment. The estimate of PDE purchases by professionals in a given year is a fraction, R , of the income of professionals in that year. First, an estimate of this fraction R must be found. For past years, estimates of the stock of equipment of professionals were found by dividing depreciation claimed by professionals by the allowable depreciation rate. Then the difference in the stock between two years plus the depreciation is taken to be PDE expenditure. The historical series of PDE calculated in this manner is very irregular. Its average over about 10 years is divided by average income to produce the value of R .

Now with an estimate of R , the PDE purchases of professionals can be estimated for any year from the income of professionals.

(13) The expenditures for equipment by non-profit institutions should be included. PDE, excluding passenger cars, purchased by churches, private hospitals and educational institutions was estimated by taking 12 percent of the Census figure for construction expenditure of such buildings.

(14) Although most household purchases other than investment in housing are PCE, there are a few exceptions where equipment, purchased by homeowners, is defined in the National Accounts as PDE. Of these exceptions, the only significant one is lawnmowers.

(15) The expenditures for plant and equipment by the rental and real estate industries are estimated by differencing the IRS balance sheets and adding the depreciation. We assumed that 15 percent of this total expenditure was for equipment.

In this report, PDE has been allocated by purchaser. The purchases total to within .5 billion dollars of the National Account figure which is based on PDE sold. The methods used have been much less accurate than the small remaining discrepancy might suggest. The roughness of the estimates should be kept in mind when using the table. All of this .5 billion dollars will be subtracted from item 6, Commercial and Other, because this figure is big and has the widest margin of error.

ALLOCATION OF P.D.E. TO PURCHASING SECTORS
1966

		<u>Equipment Purchases</u>
1. Public Utilities (OBE Survey)	8.41	4.51
less Construction	3.90	
2. Mining (OBE Survey)		1.47
3. Communications (OBE Survey)	5.62	4.02
less Construction	1.60	
4. Railroads (OBE Survey)	1.98	1.66
less Construction	.32	
5. Other Transportation		3.44
6. Commercial and Other (OBE Survey)	12.74	5.85
less Construction	6.89	
7. Petroleum Extraction		3.15
P&E	4.420	
less 1/3 P&NGD&E	- .622	
less Refining, P&E	- .669	
8. Manufacturing Equipment (Annual Survey of Manufactures)		15.00
9. Non-manufacturing Establishments of Manufacturing Companies		3.23
OBE	22.57	
ASM	-19.34	
(To be added to Trade)	3.23	
10. Agriculture		4.80
Gross Capital Expenditure	6.031	
less Dwellings	.460	
less Other and Land Improvements	.766	
11. Passenger Cars excluded from OBE Survey		3.07
12. Professional Equipment		.51
13. Non-profit Institutions		.83
14. Equipment Purchases by Homeowners (Lawnmowers)		.34
15. Rental and Real Estate		.50
TOTAL		52.38

9080
Combr 1000
Fina 1000
Servic 3000
Trade 4080

1340