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APPENDIX H

ALTERNATIVE MEASURES OF REAL OUTPUT IN SOME SERVICE INDUSTRIES

The following notes on some of the individual retail trades provide some rough alternative measures of real output and compare them with the deflated sales indexes that have been used in this study. Some of these alternatives serve as a check on the quality of the data; others involve a different concept of real output.

Automobile Dealers

A typical transaction in this industry consists of the sale of one car or one truck. The number of such sales may show rates of change different from the deflated value of sales, as shown in the following figures.¹

<i>Year</i> (1958 = 100)	<i>Deflated</i> <i>Sales</i>	<i>Number of</i> <i>New Cars</i> <i>and</i> <i>Trucks Sold</i> ^a
1939	39.5	69.9
1948	77.8	102.9
1954	103.8	128.5
1958	100.0	100.0
1963	133.3	177.2

The explanation for the differences probably lies in changes in the proportion of low-priced, medium-priced, and expensive cars sold. One way of approaching this problem of measurement would be to look at the retail margins realized on cars in different price ranges. If the percentage margins are typically the same, regardless of price range, then

¹ Source notes for all of the series presented in this Appendix are given in a footnote at the end of the Appendix.

the use of deflated sales as a measure of real output, without regard to the number of cars sold, would seem to be justified.

Drug Stores

There seems to be a very close correspondence between deflated sales of drug stores and the total number of prescriptions filled. The index for industrial production of drugs, soap, and toiletries seems to rise more rapidly than either of the other series. It may be that sales of these commodities have been increasing at a rapid rate in retail stores other than drug stores.

<i>Year</i> (1958 = 100)	<i>Deflated</i> <i>Sales</i>	<i>Number of</i> <i>Prescriptions</i> ^b	<i>Industrial</i> <i>Production of</i> <i>Drugs, Soap,</i> <i>and Toiletries</i> ^c
1939	37.9	32.3	n.a.
1948	71.2	69.8	45.2
1954	84.5	80.4	68.9
1958	100.0	100.0	100.0
1963	121.3	122.5	141.2

Food Stores

Changes in deflated sales of food stores have closely paralleled changes in industrial production of food in the postwar period. The average size of transaction has apparently been rising markedly as people tend to shop less frequently. There would be some increase attributable to higher incomes even if the frequency of shopping was unchanged.

<i>Year</i> (1954 = 100)	<i>Deflated</i> <i>Sales</i>	<i>Industrial</i> <i>Production</i> <i>of Food</i> ^c	<i>Number of</i> <i>Transactions</i> ^d
1948	77.8	86.4	n.a.
1954	100.0	100.0	100.0
1958	115.2	110.4	n.a.
1963	132.8	129.8	87.0

Gasoline Stations

Gas stations are another type of retail outlet for which the size of transaction may be of considerable importance. Casual observation suggests that productivity is much greater when pumping fifteen gallons into one tank than when servicing three cars for five gallons each. Transaction size has probably increased over time as gas tanks have become larger and incomes have risen. The following data seem relevant.

Year (1958 = 100)	Deflated Sales	Number of Pri- vately Owned Cars, Trucks, and Buses ^a	Number of Vehicle Miles Traveled ^a	Gallons of Motor Fuel Con- sumed ^a	Size of Gasoline Tank (Ford) ^e	Replac- ment Pro- duction of Tires and Batteries ^a
1939	35.0	45.4	42.8	38.8	70.0	53.8
1948	57.5	60.2	59.8	57.1	85.0	83.1
1954	81.8	85.7	84.4	83.1	n.a.	85.2
1958	100.0	100.0	100.0	100.0	100.0	100.0
1963	120.3	121.0	120.0	114.0	100.0	126.7

General Merchandise Stores

The average size of transactions has apparently risen in general merchandise stores also.

Year (1958 = 100)	Deflated Sales (1)	Number of Transactions (3 ÷ 4) (2)	Receipts in Current \$ ^f (3)	Average Sale in Department Stores in Current \$ ^g (4)
1939	53.9	61.7	27.4	44.4
1948	74.4	78.4	72.4	92.3
1954	83.2	89.0	81.3	91.3
1958	100.0	100.0	100.0	100.0
1963	131.3	117.7	135.0	114.7

Lumber Dealers, Etc.

The following figures suggest either that lumber dealers are losing out to other forms of distribution or that the deflated sales figures for 1963 understate the real amount of goods passing through this type of retail outlet.

Year (1958 = 100)	Deflated Sales	Industrial Production of		
		Lumber and Products ^c	Construction Materials ^c	Farm Equipment ^c
1948	95.2	96.0	79.3	143.5
1954	98.6	104.2	92.5	107.3
1958	100.0	100.0	100.0	100.0
1963	97.4	113.9	123.1	128.0

Services

Many of the general points that were made concerning output in retail trades also apply to the services. The attitude and skills of the person supplying the service, the amenities provided to the customer, and the demand made upon the customer's time are clearly factors that should be considered in measuring real output. The principal question in the case of services seems to be: How well does the price index capture the quality dimensions of output? Shifts in the composition of output within a Census industry can also present problems, as indicated in the following two examples.

Hotels and Motels

The postwar period has witnessed a marked shift in the composition of this industry from hotels to motels. In 1948, motels accounted for less than 10 per cent of total industry employment. By 1963 the share in motels was one-third. Receipts per worker have typically been about 5 to 10 per cent higher in motels than in hotels; this shift therefore would tend to raise the rate of change of output per man as currently measured. A factor that probably has considerable effect on output per man is the occupancy rate. Between 1939 and 1948 this rate rose markedly, but since then it has declined. By 1963 it was almost down to the 1939 level.

<i>Year</i> (1958 = 100)	<i>Deflated</i> <i>Sales</i>	<i>Occupancy</i> <i>Rate</i> ^h
1939	63.2	87.0
1948	103.2	123.2
1954	92.7	n.a.
1958	100.0	100.0
1963	117.4	91.3

Motion Picture Theaters

One of the factors tending to raise measured output per man in motion picture theaters has been a shift from regular movie houses to drive-ins. In 1948 the latter accounted for only 3 per cent of the industry's employment, but by 1963 this percentage had grown to over 20 per cent. Receipts per worker have typically been 10 to 20 per cent higher in drive-ins than in regular theaters.

Notes to Appendix H

^a Automobile Manufacturers' Association, *Automobile Facts and Figures*, various issues.

^b Number of prescriptions per store from Eli Lilly and Company, *The Lilly Digest*, 1961, 1963, multiplied by the number of establishments from the *Census of Business*.

^c Board of Governors of the Federal Reserve System, *Industrial Production Indexes*, 1961-63, and *Industrial Production, 1957-1959 Base*.

^d 1963, *Progressive Grocer*; 1954, Cox, Reavis, et al., *Distribution in a High Level Economy*, Englewood Cliffs, N.J., 1965.

^e Ford Motor Company dealer.

^f U.S. Bureau of the Census, *Census of Business*.

^g National Retail Merchants Association, *Merchandising and Operating Results*, various issues. Department and specialty stores until 1948—department stores only, subsequently. The 1954 data was estimated by assuming the 1954-56 change in the average sale of "owned" departments applied to all departments.

^h Harris, Kerr, and Foster, *Trends in the Hotel-Motel Business, 1963*. Rate refers to both hotels and motels.