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## Appendix A

### DERIVATION OF THE VALUE OF SERVICES RENDERED DIRECTLY TO CONSUMERS

As mentioned in Chapter II, §3, the starting point for the present estimates of consumers' services was found in W. H. Lough's *High-Level Consumption*.<sup>1</sup> Lough's figures, however, do not go beyond 1931, do not furnish quite all the items we wish to include, and can be improved in the light of new sources not available when he wrote. In particular the Census of Business, both for 1933 and for 1935, in spite of serious deficiencies of coverage, has added greatly to our knowledge in this field since Lough's book was written.<sup>2</sup> Moreover, certain forms of outlay, for example outlay for domestic service and medical care, are best estimated directly or indirectly through the use of income data. In such cases, as in so many other connections, I have to thank Simon Kuznets for his courtesy in allowing me access to the complete range of worksheets upon which the National Bureau income estimates are based.<sup>3</sup> I should like also to thank Milton Friedman for the use of data which he compiled in the course of a study of professional incomes in collaboration with Kuznets.<sup>4</sup>

But the original basis of the estimates, as well as many of the suggestions for source material, I owe to Lough's pioneer volume. To

<sup>1</sup> McGraw-Hill, 1935.

<sup>2</sup> Lough's estimates for consumption have been extended by Martin R. Gainsbrugh of the National Industrial Conference Board for Census years through 1937 (see *Studies in Enterprise and Social Progress*, New York 1939, pp. 135-141; also Conference Board *Economic Record*, August 24, 1939), but since Gainsbrugh's data have been published so far only in summary form, no direct use could be made of them here; however, some further reference is made to them in Appendix F. I have benefited greatly from discussion of the general problem with Mr. Gainsbrugh, and from several suggestions he made to me.

<sup>3</sup> These estimates have been summarized in Kuznets' *National Income and Capital Formation, 1919-35* (National Bureau of Economic Research, 1937); and have been revised, extended and presented in greater detail in the same author's *National Income and Its Composition* (National Bureau of Economic Research, 1941).

<sup>4</sup> Milton Friedman and Simon Kuznets, *Income from Independent Professional Practice* (National Bureau of Economic Research, in manuscript).

take full advantage of additional data and new sources, as well as to bring the estimates into as strict conformity as possible with the definition of outlay adopted here, it has been necessary to modify somewhat Lough's classification of consumers' services, or "intangibles," as he calls them. The resulting revision and extension of his estimates is presented in Table 22. Sources and methods of estimation have been indicated as far as possible in notes to the table. The totals in Table 22 run above those given by Lough for 1921-25, coincide for 1926, and for 1927-31 run somewhat below his figures.<sup>5</sup>

Most of the items in Table 22 appear to require no special justification or comment; the classification adopted there seems to be exhaustive, whatever the accuracy of individual estimates. Nevertheless, some general remarks on the estimates are called for. First, let us consider their *inclusiveness*. In deriving the data for individual items two considerations were held continually in mind: the necessity of avoiding duplication with the commodity estimates, and the importance of securing comparability within the income estimates.

Since the material in Table 22 is intended to complement Kuznets' figures for the value of commodities passing into the hands of consumers (*Commodity Flow and Capital Formation*, Vol. I, National Bureau of Economic Research, 1938) the criterion had naturally to be what had (and what had not) already been included by Kuznets. For example it has been necessary to include here the expenditure on natural and manufactured gas for domestic purposes—although gas is strictly speaking a commodity rather than a service—simply because it is excluded from Kuznets' commodity totals. In all other cases references to commodities in Table 22 relate to expenditure on the services associated with them, and not to the purchase of the commodities themselves. Special care was taken, for instance, to deduct purchases of finished commodities in compiling the series for private hospitals and for hotels. In such cases the estimates in Table 22 are not intended to represent even the whole of that portion of gross income derived from ultimate consumers, but only the fraction of it represented by services as distinct from commodities.

The estimates in Table 22 are, furthermore, designed only to include outlay which becomes, directly or indirectly, income of a kind included in the National Bureau income totals. This means that in a number of instances consumer outlay resulting in transfer payments has been excluded. For example, the estimate for expenditure on

<sup>5</sup> Cf. Table 43 below, and discussion in Appendix F.

religious activities excludes transfer payments (charitable or otherwise) to domestic recipients, since such payments will nowhere appear in the income stream as the National Bureau computes it. Similarly, no allowance is made for services rendered to boarders and lodgers outside hotels, for the income totals include no estimate of the income derived from this source. In this connection the treatment of outlay for insurance perhaps requires some explanation. The two chief kinds of insurance purchased by ultimate consumers are of course automobile and life. In neither case would it be appropriate to include the whole of the premiums paid, even by final consumers. We may assume that the premium receipts of an insurance company are divided (in an unknown ratio) between claims paid, additions to reserve, and cost (including profit) of operation. Only the last of these three items enters the income stream. In the case of automobile insurance, the difference between premiums and claims paid, adjusted to exclude business use of automobiles, was taken as the required amount. The net cost of life insurance was assumed to be equal to the labor cost involved in its provision. No allowance for profits is necessary, in this case, owing to the peculiar treatment accorded life insurance companies in the income estimates. Whether organized on a mutual basis or otherwise, they are there regarded as associations of individuals. Consequently any profits they may distribute are omitted from the income side, and any contribution to profits from premiums may be omitted here also.<sup>6</sup> A somewhat similar question arises in connection with the entry for fraternal and labor union dues. Some portion of the payments made to fraternal insurance societies presumably enters the income stream; part of the dues paid to labor unions and other organizations of which insurance is a subsidiary activity do not result in income. Nevertheless, the only possible plan was to include all dues paid to the latter, and to neglect the former group entirely.

The second question has to do with the *precision* of the figures, which we shall regard first as estimates of the gross income of the activities concerned, neglecting for the moment the problem of consumer allocation. Clearly this precision must vary greatly as between individual entries. It is hard to make even the roughest numerical estimates for the accuracy of particular items, although the comparison between the levels of outlay and income undertaken in Chapter

<sup>6</sup> However, profits earned (as interest or otherwise) on life insurance investments are included in the income estimates as income distributed by the issuers of the obligations which the insurance companies hold. For further discussion, see *National Income and Its Composition*, Chapter 2.

TABLE 22

EXPENDITURE ON SERVICES RENDERED DIRECTLY TO CONSUMERS,  
ANNUALLY 1921-38*Millions of current dollars*

	1921	1922	1923	1924	1925	1926	1927
1. Personal services	1,314	1,285	1,503	1,425	1,418	1,581	1,581
(a) Clothing <sup>a</sup>	315	294	317	307	301	293	293
(b) Other personal services <sup>b</sup>	999	991	1,186	1,118	1,117	1,288	1,288
2. Home expenses	11,271	11,671	12,657	13,582	13,819	13,886	14,000
(a) Rentals, nonfarm—paid <sup>c</sup>	3,857	3,993	4,267	4,540	4,554	4,488	4,488
(b) Rentals, nonfarm—imputed <sup>c</sup>	3,713	3,840	4,241	4,631	4,675	4,634	4,634
(c) Rentals, farm <sup>c</sup>	971	876	855	914	876	861	861
(d) Domestic service <sup>c</sup>	1,433	1,554	1,698	1,802	1,892	1,971	2,000
(e) Electric current <sup>d</sup>	315	350	400	428	475	478	478
(f) Gas <sup>e</sup>	395	445	491	520	543	564	564
(g) Laundering <sup>f</sup>	217	206	256	266	277	315	315
(h) Moving, repairs, storages <sup>g</sup>	100	111	125	128	130	135	135
(i) Telephones <sup>h</sup>	270	296	324	353	397	440	440
3. Medical expenses	1,002	1,441	1,548	1,609	1,802	1,976	1,976
(a) Private hospitals <sup>i</sup>	128	145	170	189	200	216	216
(b) Doctors <sup>j</sup>	607	892	934	942	1,040	1,143	1,143
(c) Dentists <sup>j</sup>	169	253	277	295	344	373	373
(d) Secondary practitioners <sup>j</sup>	52	79	85	93	108	118	118
(e) Nursing <sup>j</sup>	46	72	82	90	110	126	126
4. Education and religion	764	835	888	946	999	1,052	1,052
(a) Private education <sup>k</sup>	219	253	270	284	297	321	321
(b) Artists and musicians <sup>l</sup>	73	83	91	97	103	110	110
(c) Religious activities <sup>m</sup>	472	499	527	565	599	621	621
5. Transportation and recreation	4,015	4,005	4,492	4,671	4,910	5,216	5,216
(a) Bus fares <sup>n</sup>	858	858	904	883	930	941	941
(b) Ferries and taxicabs <sup>o</sup>	95	107	122	136	150	159	159
(c) Automobile taxes <sup>p</sup>	82	102	127	137	169	185	185
(d) Automobile insurance <sup>q</sup>	67	72	85	86	99	116	116
(e) Automobile repairs <sup>r</sup>	255	304	383	467	553	579	579
(f) Railroad fares <sup>s</sup>	816	765	818	770	762	754	754
(g) Air travel <sup>t</sup>	—	—	—	—	—	—	—
(h) Hotels <sup>u</sup>	633	647	663	674	690	706	706
(i) Foreign travel <sup>v</sup>	259	295	320	387	447	415	415
(j) Recreation and amusements <sup>w</sup>	950	855	1,070	1,131	1,110	1,361	1,361

1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
1,521	1,614	1,436	1,255	917	864	975	1,039	1,176	1,203	1,163
274	262	240	211	165	162	183	197	214	234	208
1,247	1,352	1,196	1,044	752	702	792	842	962	969	955
4,220	14,639	14,333	13,170	11,550	10,223	10,215	10,716	11,376	12,162	12,382
4,410	4,413	4,356	4,233	3,923	3,549	3,519	3,760	4,079	4,313	4,491
4,700	4,828	4,851	4,385	3,780	3,221	3,054	3,112	3,213	3,407	3,545
841	834	841	819	701	583	569	618	598	609	653
2,040	2,145	1,843	1,440	1,056	920	1,051	1,119	1,260	1,493	1,303
572	631	679	692	673	655	685	722	753	800	840
613	633	606	548	530	491	486	489	496	505	505
375	431	429	360	271	241	281	295	330	350	356
148	150	135	115	101	89	89	94	99	106	108
521	574	593	578	515	474	481	507	548	579	581
2,073	2,082	1,996	1,814	1,490	1,373	1,506	1,602	1,811	1,969	2,024
269	294	308	294	269	243	250	270	304	347	373
1,152	1,101	1,027	939	767	719	799	843	955	1,028	1,045
390	413	402	353	280	250	270	281	311	333	337
126	130	118	102	77	69	77	81	92	98	100
136	144	141	126	97	92	110	127	149	163	169
1,151	1,193	1,198	1,148	1,047	944	939	994	1,064	1,133	1,162
366	377	392	406	401	369	363	393	423	448	460
124	130	132	130	122	114	113	115	119	122	124
661	686	674	612	524	461	463	486	522	563	578
5,880	6,060	5,386	4,563	3,457	3,115	3,384	3,708	4,229	4,565	4,187
975	999	886	796	686	649	674	732	817	843	731
196	213	200	186	174	169	157	171	200	211	208
207	223	227	218	206	192	193	204	226	251	244
157	163	110	119	133	101	112	129	179	204	175
751	768	604	478	349	388	451	459	456	483	432
659	641	540	411	282	246	262	272	314	338	307
3	6	8	7	8	11	12	18	25	26	31
702	730	670	533	390	333	401	466	522	570	537
633	674	632	472	345	251	284	351	427	484	443
1,597	1,643	1,509	1,343	884	775	838	906	1,063	1,155	1,079

TABLE 22 (continued)

	1921	1922	1923	1924	1925	1926	1927
6. Miscellaneous	1,133	1,081	1,198	1,277	1,397	1,470	1,470
(a) Postage <sup>x</sup>	226	236	259	277	293	321	321
(b) Legal expenses <sup>y</sup>	70	95	103	109	124	135	135
(c) Dues <sup>z</sup>	156	149	142	144	149	151	151
(d) Immigrant remittances <sup>aa</sup>	365	267	307	322	352	346	346
(e) Net cost of life insurance <sup>bb</sup>	316	334	387	425	479	517	517
TOTAL	19,499	20,318	22,286	23,510	24,345	25,181	25,181

<sup>a</sup> Includes dressmakers, milliners, tailors, repairs and storage. Lough's estimate for 1929 has been revised to exclude fur and shoe repair outlays included by us in 1.(b), and extrapolated by means of National Bureau of Economic Research estimates for income originating in the hand trades.

<sup>b</sup> *Census of Business*, 1933 and 1935, extrapolated by means of NBER estimates for income originating in the service industries. Intended to include services rendered to consumers by the following census groups: barber shops; beauty parlors; cleaning, dyeing, pressing, alteration and repair shops; valet shops; funeral directors and embalmers; fur repair shops; hand laundries; photographic studios; shoe repair shops; shoe shine parlors; jewelry repair shops; other personal services. Receipts from sales of merchandise have been excluded to avoid duplication with the commodity outlay totals (Table 1). Consumer allocations of 100 percent were applied to all groups except photographic studios (65 percent) and jewelers' services (50 percent).

<sup>c</sup> These items are based on corresponding components of the NBER estimates of national income. Estimates for paid and imputed rentals are on a comparable basis, and both are gross of repair insurance and property taxes. Imputed rentals are reckoned gross of mortgage interest. The estimates for farm rentals (due originally to the Bureau of Agricultural Economics) cover the resident portion only, are partly paid and partly imputed, and include rentals for homes occupied by farm employees. The series for domestic service is gross of compensation in kind, and includes outlay for private chauffeurs.

<sup>d</sup> For 1921-25, based on total revenue from sales of the electric light and power industry, *Survey of Current Business*; for 1926-28, *Annalist*, April 22, 1932; for 1929-38, domestic consumption per k.w.h. valued by revenue per k.w.h. for domestic service (Edison Electric Institute, *Statistical Bulletin*, No. 7, March 1940).

<sup>e</sup> Natural and manufactured. Lough's figures have been extended on the basis of data on revenue from domestic sales compiled by the American Gas Association (*Survey of Current Business*).

<sup>f</sup> Includes laundering by power laundries, and dyeing and cleaning. Estimates of gross receipts for 1927, 1929, 1931, 1933 and 1935 based on the *Census of Manufactures* were interpolated for other years by means of NBER estimates for income originating in corresponding groups.

<sup>g</sup> Lough's estimate is taken directly and extrapolated on the basis of the movement of the "home expenses" group.

<sup>h</sup> *Census of Electrical Industries* and Bell System receipts (*Survey of Current Business*); allocated to consumers, 50 percent.

<sup>i</sup> The 1935 estimate is the fraction of total hospital income derived from patients, taken from *Business Census of Hospitals, 1935* (U. S. Public Health Service); interpolation by means of NBER national income estimates for total salaries, wages and maintenance, private hospitals. It was found that no adjustment was required for possible duplication with the commodity totals, for care investigation suggested that hospital expenditures for finished commodities are almost exactly offset by income from sources other than patients' fees: cf. statistical summary for New York and Chicago hospitals published annually in *The Modern Hospital*, and *Hospital Market Data Book* (Modern Hospital Publishing Co., Chicago).

1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
1,537	1,576	1,541	1,427	1,243	1,152	1,167	1,224	1,298	1,384	1,367
338	338	343	319	284	282	280	299	318	347	347
144	151	147	134	112	104	111	119	132	146	150
151	145	144	139	130	117	122	124	145	166	178
338	336	296	260	199	180	154	159	172	170	150
566	606	611	575	518	469	500	523	531	555	542
3,382	27,164	25,890	23,377	19,704	17,671	18,186	19,283	20,954	22,416	22,285

Based on NBER national income estimates. Ratios of gross to net income from various sources, especially the publications of the Committee on the Costs of Medical Care; Maurice Leven, *The Income of Physicians and The Practice of Dentistry* (University of Chicago Press, 1932); Herman Leven, *Economic Conditions in the Dental Profession, 1929-37* (U. S. Department of Commerce, 1937); Walter L. Slifer, "Income of Independent Professional Practitioners," *Survey of Current Business*, April 1938; and Milton Friedman and Simon Kuznets, *Incomes from Independent Professional Practice* (National Bureau of Economic Research, in manuscript). A small amount of duplication with the commodity outlay totals (Table 1) is present because of the unavoidable inclusion of medical and dental supplies in the estimates of gross income.

Except teachers of art and music. Consumer expenditure estimates based on data in the *Biennial Survey of Education* (U. S. Office of Education), interpolated by means of NBER national income estimates for private education.

Includes teachers of art and music. Lough's figures have been extended on the basis of NBER estimates of income accruing to private education and religious activities.

Includes missions. *Census of Religious Bodies, 1926*, together with data from NBER estimates of national income. Estimated total expenditures were reduced by 10 percent in order to exclude other expenditures of a charitable nature made to domestic recipients.

Includes street railway fares. Based on operating revenue data taken from *Bus Facts* (annual publication of the National Association of Motor Bus Operators), *Survey of Current Business*, and *Survey of Business*, 1933 and 1935. Allocations to consumers: 90 percent for city, and 75 percent for city buses; 80 percent for street railways.

Lough's figures have been revised and extended, in the case of ferries by means of NBER national income figures for the industry, and in the case of taxicabs by estimates of gross revenue based on information supplied by the American Transit Association and the Cab Research Bureau (Cleveland, Ohio). Consumer allocation for taxicabs was taken at 65 percent.

Fees for registration (plates) and operators' licenses. See *Statistical Abstract of the United States*. Allocation to consumers, 85 percent of the portion applicable to passenger cars.

Premiums less claims paid. See *Insurance Yearbook* and *Automobile Facts* (annual publication of the Automobile Manufacturers' Association). Allocation to consumers, same as preceding item. Includes storage. *Census of Distribution, 1929*; *Census of Business, 1933* and *1935*. Extended by means of series on motor vehicle registrations and shipments of replacement parts, *Survey of Current Business*. Allocation to consumers, same as preceding item.

Includes Pullman fares. Gross revenues from Interstate Commerce Commission data (*Survey of Current Business*). Allocation to consumers, 67 percent.

For 1930-38, passenger miles flown multiplied by passenger fares per mile, as reported in the *Air Commerce Bulletin* (U. S. Department of Commerce). For 1928-30, extrapolation on basis of gross revenues of air transport companies as reported in the *Statistics of Income*, less revenues from mail contracts. It is assumed that business use of airlines is offset by revenue from baggage, etc., not separately included.

Footnotes to Table 22 continued on next page.



Footnotes to Table 22 continued.

<sup>u</sup> Estimates for 1929, 1933 and 1935 based on *Census of Hotels*. A deduction from total receipts was made in order to exclude hotel sales of food, drink and other merchandise already included in the commodity totals (Table 1) at their ordinary retail value; this retail value was taken as 40 percent of the actual receipts from the sale of food, etc. (cf. Messrs. Horwath and Horwath's annual publication *Hotel Operations* for 1937). A consumer allocation of 76 percent was applied to the remaining receipts: this ratio was derived on the assumption that half the receipts of hotels classed by the census as transient, and all of the receipts of other hotels, represent consumer use. Data for other years based on growth in number of hotels (*Statistical Abstract*), hotel occupancy and revenue per occupied room (*Survey of Current Business*).

<sup>v</sup> Includes ocean passages. For 1921-34, R. O. Hall, *International Transactions of the United States* (National Industrial Conference Board, 1936). For 1935-38 based on *Balance of Payments of the United States* (annual publication of the U. S. Department of Commerce). Allocation to consumers, 75 percent.

<sup>w</sup> *Census of Business*, 1933 and 1935, and industry estimates of motion picture revenue as reported by the Department of Commerce for the years 1933-35. Data for other years were extrapolated on the basis of income originating in the amusement industry as estimated by the NBER study of national income.

<sup>x</sup> *Statistical Abstract of the United States*. Allocation to consumers, 50 percent.

<sup>y</sup> Consumer outlay assumed equal to 20 percent of the NBER estimate of income originating in the industry.

<sup>z</sup> Fraternal, civic, union and grange dues; as explained in the text of Appendix A, the figures purport to exclude transfer expenditure. Membership estimates based on *Statistics of Fraternal Societies*; Leo Wolman, *Ebb and Flow in Trade Unionism* (National Bureau of Economic Research, 1936) and A. F. of L. and C. I. O. convention reports; multiplied by estimates of annual dues payments.

<sup>aa</sup> Figures kindly supplied by Amos E. Taylor of the Finance Division of the U. S. Bureau of Foreign and Domestic Commerce on the basis of an unpublished study, and reproduced with his permission.

<sup>bb</sup> This series represents the total compensation of life insurance employees and agents as reported in the Compendiums to the *Life Insurance Yearbook*. For discussion see text of Appendix A.

III has some bearing upon the range of error of the totals, taken in conjunction with other elements of outlay. In general, items covered by census data or reliable trade estimates appear to contain the smallest margin of error. It is unfortunately necessary to reckon with considerable deficiencies of coverage in the two censuses most useful for our purpose—those relating to service establishments in 1933 and 1935. (The undercoverage of the former appears to be particularly serious.) In at least one instance—bus and street railway fares—the trade estimates available appear to be superior to the corresponding census material.<sup>7</sup> On the other hand the validity of figures compiled by trade or similar organizations is sometimes very hard to judge when the data cannot be checked independently. If two cases were to be singled out as rival occupants of the darkest corner of the field,

<sup>7</sup> I am particularly grateful to Carl W. Stocks, editor of *Bus Transportation*, for advice and criticism in connection with the evaluation of this item.

I should choose religious activities, and recreation and amusement. These presented the greatest difficulty, and are probably subject to the largest margin of error, in spite of the fact that both items have at one time or another been the subject of census investigation.<sup>8</sup>

Third, an important element of doubt which affects considerably the precision of any estimates of this kind arises over the problem of *consumer allocation*. This difficulty is already present in the derivation of the commodity totals, for there are many finished goods whose output is used partly by final consumers and partly by business enterprises. But in the measurement of services purchased by consumers, the problem becomes particularly acute. In the case of many items, e.g. recreation and amusement, substantially the whole of the expenditure is made by final consumers. But what of expenditure on the various forms of passenger transportation, on telephone service, and on the services of hotels? In some cases, for example gas and electricity, the segregation of domestic from business use presented little difficulty. In other cases the allocation to consumers became of necessity an arbitrary matter. The allocations chosen are identified in the notes to Table 22: in most instances they are the same as those assumed by Lough.<sup>9</sup>

Finally, as noted in Chapter II, §3, the *independence* of the derivation of the outlay totals from that of the income totals is compromised to a slight extent through the use of a certain amount of material common to both. The figures for rentals (paid and imputed) have been taken over directly from the National Bureau data on national income, for such outlay becomes income automatically. Moreover it did not in general appear possible to estimate consumer expenditure on the services rendered by the professions, except by deriving the

<sup>8</sup> The estimates shown in Table 22 were originally compiled by myself through 1935. Their checking, revision and extension through 1938 is the work of Jacob M. Gould of the National Bureau of Economic Research. While we never were reduced to mere guesswork, I am sure that Mr. Gould will agree with me if I say that on one or two occasions the poverty of the data forced us perilously close to this situation.

<sup>9</sup> The general problem of allocation, as it affects both commodities and services, is discussed in the text, Chapter III, §2. In principle, of course, precisely the same difficulties arise in the determination of income. How much of finished goods, and of those services which are rendered in the same form to final consumers and to business, (1) ought to be, (2) actually are, included in the costs (mainly as expense accounts) of business enterprises? If we knew the answer to (1) we could measure income as it should be measured. If we knew the answer to (2) we could at least measure consumption on the same basis as we actually measure income. In practice (2) is of course determined by business custom as modified by revenue legislation, but we cannot make consumption estimates conform to this practice except through inspired guesswork.

gross incomes of doctors, dentists and others as a multiple of their net incomes. It is not, however, necessary to assume that the ratios of gross income to net income for the different professions is invariable from year to year; nor has such an assumption been made. There is in fact plenty of evidence that they vary markedly over time, which indeed is what one might expect. But, when all such considerations are taken into account, it remains true that for these items a certain amount of basic data is common to the determination of income and of outlay. The same situation will prevail until consumer expenditure in the aggregate becomes measurable on some different principle, for example, the study of consumers' budgets.<sup>10</sup>

<sup>10</sup> Some comments on an attempt of this sort by the National Resources Committee will be found in Appendix F below.

Appendix B

QUARTERLY NET INCOME OF CORPORATIONS