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ESTIMATES OF WASHINGTON PERSONAL CONSUMPTION EXPENDITURES

1954 - 1967

For purposes of implementing an econometric model in a state expenditure framework, estimates of personal consumption expenditures for the State of Washington have been prepared for the period 1954 - 1967. Measures were sought which would compare closely in concept with the personal consumption expenditures (PCE) of the national income and product accounts. The following discussion contains a review of available consumer spending data, an explanation of the methodology developed for the Washington estimates, and a comparison of results obtained by different procedures. Estimates of consumer expenditures for automobiles and parts were also prepared and are discussed in the closing section.

In developing an accounting framework for the state econometric model, we have chosen to adhere as closely as possible to the variables of the national income and product accounting system. The advantages of comparative analysis and the close ties which inevitably exist between regional and national forecasting dictate this approach. Our principal objective is to develop a regional econometric model which links into models at the national level, and for this purpose it is desirable to generate state economic variables closely consistent with national counterparts.

It is recognized that the system of classification of expenditures used in the national accounts may not always be most useful for regional analysis. A special set of accounts which takes cognizance of the peculiarities of

readily available state economic data, and also takes into consideration the analytical techniques of regional analysis, is needed. The development of the regional accounts for the State of Washington is affected by both of these considerations.

National PCE Estimates

Personal consumption expenditures, as defined in the national product accounts, consist of the market value of purchases of goods and services by individuals and non-profit institutions and the value of food, clothing, housing, and financial services received by them as income in kind. It includes the rental value of owner-occupied houses but does not include purchases of dwellings, which are classified as capital goods.[1] It includes purchases by residents of the United States abroad as well as within the country, and excludes the sale of consumer goods in the United States to foreign residents traveling in this country.

National estimates of personal consumption expenditures are made by using a variety of procedures and an assortment of statistical sources. The discussion in National Income, 1954 Edition, indicates a combination of techniques are used. These are referred to as (a) the commodity flow method, (b) the retail valuation method, (c) imputations, and (d) miscellaneous methods. With the reconciliation of the national input-output tables to national income accounting concepts beginning in 1958, the procedures for estimating GNP and personal

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[1] U. S. Department of Commerce, Office of Business Economics, National Income, 1954 Edition, A Supplement to the Survey of Current Business, p. 59 (hereafter referred to as National Income, 1954 Edition).

consumption expenditures have been substantially revised; however, no comprehensive statement of the details underlying the PCE estimates of the 1958 (and forthcoming 1963) input-output tables has yet been published.

In estimating consumer expenditures for a state, it might seem feasible to parallel the procedures which are employed to develop estimates for the nation. Even a cursory perusal of the data input required nationally and the available series for states suggests this would be an extremely difficult undertaking and possibly an impossible task. It is clearly one beyond the resources of the present study. Instead, we have used an approximating technique which utilizes readily available state economic data. While there is no standard against which these results can be matched for evaluation, there have been other attempts to approximate the PCE of Washington State. A brief resume of these earlier findings is in order before discussing the methodology and results of the current inquiry.

Personal Consumption Estimates by Romans

Estimates of PCE for the State of Washington and other states have been developed by Romans for the years 1953 and 1957.[2] His estimates were obtained by the difference between estimated state personal savings and state personal disposable income, the latter reported by the U. S. Department of Commerce. Thus, PCE is a residual.

Personal savings were estimated as the difference between depreciation

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[2] J. Thomas Romans, Capital Exports and Growth Among U. S. Regions (Wesleyan University Press, 1965).

and gross personal savings. Gross personal savings were defined as the net of (total increase in financial assets = gross increase in tangible assets - total increase in debt). While Romans does not specifically acknowledge the correspondence between his procedures for estimating personal savings and that used by the U. S. Securities and Exchange Commission for national savings estimates, the concepts and procedures are quite similar.[3] Conceptually the PCE estimates by net asset change approach are equivalent to those of the U. S. Department of Commerce even though reached by an entirely different route. However, because of inadequate state data, it was necessary for Romans to allocate national totals among states by untested estimation procedures. There is also an implicit assumption that the claimants to asset changes (or obligants to debt changes) reside in the state where changes in assets (or liabilities) take place. It also appears that the gross state savings concept is a mixture of "savings wherever located accruing to residents" and "savings within the state without regard to residence of claimants".[4]

Romans' estimates of PCE and personal savings are shown in Table 1. Since their preparation, the measures of Washington personal disposable income have been revised upward. Taking into account these revisions, his estimates would

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[3] U. S. Securities and Exchange Commission Statistical Bulletin (August 1968 and February 1969).

[4] For example, bank deposits were credited as assets of the residents of the state in which they are held, while undistributed corporate profits were allocated to states on the basis of dividend income received by residents.

yield PCE rates of $4,030 and $4,824 millions for 1953 and 1957 respectively, without making any allowance for revisions in the calculation of personal savings.

Table 1

Romans' Estimates of Personal Savings and PCE, Washington State, 1953 and 1957 ($millions)

	1953	1957
Personal Disposable Income (From Commerce)	4,277	5,161
Less: Personal Savings	304	409
Personal Consumption	3,973	4,752
PCE Revised Basis	4,030	4,824

HERP Estimates

Polenske and Whiston at the Harvard Economic Research Project (HERP) have estimated state PCE for the years 1958 and 1963 to develop the final demand vectors for state input-output tables.[5] Two sets of estimates were prepared using techniques described as Scheme I and Scheme II. The methodology for both estimates is basically the same but differ only in the level of commodity disaggregation used in preparing the estimates. Therefore, we will not differentiate between them in the following discussion of their procedures.

The basic data drawn upon for estimating state personal consumption are

[5]Karen R. Polenske and Isabelle B. Whiston, "Personal Consumption Expenditures, 1947, 1958, 1963," Report No. 7 (August 1968); and "State Estimates of Personal Consumption Expenditures, 1947, 1958, 1963, Scheme II," Report No. 14 (August 1968), Harvard Economic Research Project (mimeographed).

the 1950 and 1960 Consumer Expenditure Survey undertaken by the Bureau of Labor Statistics. Consumer expenditures by spending units are available by commodity class for four regions of the U.S. (the "West" is relevant for the Washington estimates), by income classes, and by urban and rural categories for these years. The expenditures for each commodity by consumers within each state in each region is determined by multiplying the average consumption expenditures of each income group within a region by the estimated number of consumer units in the respective groups (income class, urban-rural categories). Total consumer spending in each state is then calculated as the sum of expenditures for each commodity. While the procedure appears fairly direct, the actual execution is complicated by the need to reconcile the different sets of data which enter into the calculations.

This procedure assumes that spending units in a given position within each region behave alike in respect to consumption, and that differences in total consumption among states are associated with the number and mix of spending units in respect to income and rural-nonrural categories. Some extrapolation is involved to attain the 1958 and 1963 estimates since the expenditure survey data apply to 1950 and 1960.

Table 2

Polenske-Whiston PCE Estimates
For Washington State ($mil.).

	Scheme I	Scheme II
1958	n.a.	$5,274
1963	$6,887	6,829

Source: HERP unpublished tabulations.

Table 2 presents the total PCE estimates developed by Polenske and

Whiston. Since total personal disposable income of Washington is less than these expenditure estimates, it appears that either the basic data or the methodology for estimating PCE is unreliable as applies to this state. It seems very unlikely that personal savings in the higher-than-average income state of Washington would be negative.

Washington Input-Output Study Estimates

An input-output study for the State of Washington for 1963 provided estimates of consumer expenditures for that year.[6] Total PCE was estimated on the basis of an analysis of the APC ratios for Seattle and small Western cities and rural communities in the Western United States derived from the BLS consumer expenditure survey of 1960, applied to state personal income as reported by the Department of Commerce. No allowance was made for the stratification of incomes, as in the Polenske-Whiston estimates, nor was the total PCE built up from consumption-by-commodity. The published estimate of Washington PCE of $6,100 million is a judgment estimate based on the considerations mentioned above and not the product of a clear-cut formula.[7]

Retail Sales Method for Estimating PCE

National estimates of PCE rely principally upon the commodity flow

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[6]Philip J. Bourque, et al, The Washington Economy: An Input-Output Study, Graduate School of Business Administration, University of Washington, 1966.

[7]Washington Input-Output Study Working Reports.

procedures in which the output of goods and services of industry are allocated between intermediate output and final goods. The latter is distributed according to categories of use, i.e., consumers, capital formation, government and export. Production for these markets is then traced through the channels of distribution to take account of transportation costs, wholesalers' and retailers' markups, and indirect business taxes. In effect, the domestic supply of goods and services are traced through the system of exchange from producers to wholesalers to retailers and to households.

At the state level it appears promising to estimate PCE by entering into the distributive process at the retail level. Retail trade statistics for Washington (and other states) are available for the census years from the Census of Business; receipts of establishments performing selected services are also reported. Both the retail sales and the service receipts data are utilized in estimating national PCE, and annual (quarterly) retail trade statistics are the principal data utilized in making interpolations and extrapolations of benchmark PCE estimates nationally.

Specifically, it is proposed that state retail sales and service receipts statistics, with adjustments for coverage, can provide useful approximations of PCE by state. This is not a hypothesis which can be tested against a known standard. Instead, the thesis must be evaluated in terms of the appropriateness of the data for the purpose and the adjustments made to reach the objective.

It is recognized that the coverage of retail sales and service receipts as reported by the Census of Business are not correspondent with PCE as

defined in the national income and product accounts. The major areas of disagreement are as follows:

(1) The retail sales are reported on an establishment basis, and include establishments primarily engaged in selling merchandise to personal, household and farm users. Therefore:
   (a) Certain intermediate inputs to farmers (not for household or personal consumption) are included;
   (b) An uncertain portion of retail sales transactions are intermediate inputs to business and government.

(2) Service receipts include only establishments performing selected services. Of the 14 major groups of services defined in the Standard Industrial Classification Manual, seven are included in the Census of Business (Selected Services). These include SIC 70, 72, 73, 75, 76, 78 and 79. None of the services in the SIC 80's are included, so that medical, legal, and educational services are not covered, and museums, nonprofit membership organizations, and certain other services are also excluded from coverage. Moreover, the services of domestics and rental services of dwellings are also excluded although these are included in the OBE measurement of services in the national income and product accounts.

(3) Retail sales or service statistics in the Census of Business do not cover all goods entering into PCE. Conspicuous items excluded are goods sold to consumers by producers which do not pass through retailers, payments in kind, and own produce consumed on farms.

(4) State retail sales and service receipts statistics include sales without regard to location or residence of purchaser. Some sales reported by establishments in the state are "exports" to nonresidents, and some consumer expenditure by residents are not reported by establishments in the state because they are by mail order or in the course of out-of-state travel.

(6) Retail sales statistics cover not only goods but some services rendered by retail outlets; and service receipts include sales of goods by service establishments. This creates difficulties in disentangling purchases of goods from purchases of services by consumers.

A comparison of national PCE estimates and national retail sales and service receipts, shown in Table 3, provide a basis for evaluating the net differences between them in coverage. Total census retail sales and services combined were 81.8%, 80.3% and 77.5% of national PCE for the years 1954, 1958

Table 3

Summary of PCE Indicators for U.S. and Washington
Census Years 1954, 1958 and 1963

	1954	1958	1963	Percentage Change 1954-58	Percentage Change 1958-63
	($BILLIONS)				
U.S. PCE	236.5	290.1	375.0	22.7	29.3
Durable Goods	32.8	37.9	53.9	15.5	42.2
Nondurable goods	118.3	140.2	168.6	18.5	20.2
Total Goods	151.1	178.1	222.5	17.9	24.9
Services	85.4	112.0	152.4	31.1	36.1
Components of Services					
Housing	31.7	41.1	55.4	29.7	34.8
Services, Excluding Housing	53.7	70.9	97.0	32.0	36.8
U.S. Census of Business					
Retail Sales, U.S.	170.0	200.4	244.2	17.9	21.9
Selected Services, U.S.	23.5	32.5	44.6	38.2	37.2
Military Commissaries, etc.	---	---	1.8	---	---
Total Census Sales	193.5	232.9	290.6	20.4	24.8
	($MILLIONS)				
Washington Census of Business					
Retail Sales	2,873.7	3,418.6	4,042.6	19.0	18.3
Selected Services	382.4	436.9	540.2	33.0	23.6
Military Commissaries, etc.	---	---	60.3	---	---
Total Census Sales	3,202.1	3,855.5	4,643.1	20.4	20.4

and 1963 respectively. Comparing retail sales with durable plus nondurable goods components of PCE indicates ratios of 112.5%, 112.5% and 109.8% for these same years. Hence, retail sales statistics overestimate consumer expenditures for goods, while service receipts greatly underestimate the expenditures for services. In order to make adjustments for over and under coverage in the state reports, factors derived from national coverage are applied to the statistics for the state.

The estimating equation used to measure Washington PCE expenditures is:

$$\left[W_R \cdot \frac{\text{US D + ND}}{\text{U.S.}_R} \right] + \left[W_S \cdot \frac{\text{U.S. SERV}}{\text{U.S.}_S} \right] = \text{WASH. PCE}$$

where

W_R	is Washington Retail Sales from Census of Business
US D + ND	is U.S. durable plus nondurable PCE expenditures
W_S	is Washington Service Receipts from Census of Business
U.S. SERV	is U.S. expenditures for services in PCE accounts
U.S._S	is Service Receipts from Census of Business.

The ratio shown in each term within brackets is simply an adjustment ratio for the net difference between the PCE variable and the census variable. The ratios for each of the years are shown in Table 4.

Table 4

National Ratio of PCE Variable and Census Variable

	1954	1958	1963
US D + ND/U.S._R	.8882	.8887	.9045
U.S. SERV/U.S._S	3.6340	3.4462	3.4170

Using these national ratios as estimators or "blow-up" factors for census data reported for Washington State yields estimates of Washington personal consumption expenditures as follows:

Table 5

Estimated Washington PCE ($Millions)

	1954	1958	1963
Durables plus Nondurables	2,554.1	3,038.2	3,711.0
Services	1,193.4	1,505.6	1,845.0
Total PCE	3,747.5	4,543.8	5,556.9

The limiting assumptions underlying these estimates are as follows:

1. The coverage of the Census of Business is geographically uniform, with the degree of difference between national PCE and national census totals also applicable to Washington State.

2. The extent to which households rely on local retail outlets or service establishments is uniform among states.

3. While the level and mix of consumer spending among regions is allowed to vary as reflected by the census reports, it is assumed that uncovered expenditures vary proportionately with those expenditures which are reported.

While none of these assumptions is likely to be exactly true, none appear unreasonable. It should be noted that household-oriented sales reported for Washington in the Census of Business account for 85% of estimated PCE in 1954 and 1958, and 84% in 1963. Moreover, the procedure does not require strict comparability of the census between years. Nevertheless, the census of each year was conducted under similar conditions and procedures in all major respects. The minor differences do not affect the comparability of the census for the purposes of this study.

The estimates of Washington PCE for 1954, 1958 and 1963 derived above may

be evaluated for consistency in relationship to income. Since the state PCE and income estimates are arrived at by statistically independent routes, the relationships between them may be evaluated as a test of the reasonableness of the results. From Table 6 it appears that the ratio of PCE to personal income in Washington is less than that for the U. S. Since personal income per capita in Washington is higher than in the U.S., this is precisely what is expected on an a priori basis. Of course, this does not constitute a proof of empirical validity; but the test does not contradict a relationship which has been found in repeated studies elsewhere.

Table 6

Ratios of Income to Personal Consumption, and Per Capita Capital Personal Income, U. S. and Washington

	Personal Consumption Expenditures As a Percent of Personal Income		Personal Income Per Capita ($)	
	U.S.	Wash.	U.S.	Wash.
1954	.815	.756	$ 1,785	2,001
1958	.803	.760	2,068	2,213
1963	.806	.734	2,455	2,622

Washington PCE Estimates Between Census Years

For the years between the Census of Business, retail sales and service receipts are not consistently available. The Bureau of Census publishes the Monthly Retail Trade Report and the Annual Retail Trade Report, which provide estimates of retail sales for the following states: California, Florida, Illinois, Indiana, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Texas and Wisconsin. These

estimates are prepared monthly from a sample of stores. Estimates are also prepared for major trading centers in other areas, too, and the samples are used to project national retail sales. The estimates based on these samples for the census years differ from the Census of Business retail trade estimates by less than 1%, which lends credibility to the sampling procedure for estimating annual U. S. retail sales. For smaller areas the sampling error is greater. However, with adjustment for census years, the annual retail sales reports in those 15 states should provide a useful estimate of retail sales and a basis for projecting personal consumption expenditures.

Unfortunately, annual retail sales estimates are not prepared by the Bureau of the Census for Washington State. However, an alternate source for estimating state sales is available from sales tax revenues. For Washington and other states with sales taxes, this information has potential value for projecting personal consumption expenditures. (All but nine states have sales taxes.)

Washington State imposes a broadly-based sales tax at the retail level. Purchases made for re-sale are exempt, so that it is basically a tax on final users (no inference should be drawn from this statement pertaining to incidence). In addition to exempting purchases made for re-sale, Washington law (as of 1967) provided for some 20 exemptions of other transactions not subject to tax. However, the tax is quite comprehensive, as indicated by the following phrasing of instructions for preparing Washington retail sales tax reports:

> "The following sales are retail sales: Sales of all articles to persons or corporations who use or consume the property purchased, such as sales of groceries or hardware to a householder;
>
> Sales of services in respect to the repairing, cleaning, improving, etc. of personal property of consumers;. . . .
>
> Sales of services in respect to the construction, repairing, improving, etc. of new or existing buildings or other structures of real property of consumers;. . . . "

The breadth of the retail sales tax is indicated by the fact that taxable retail sales exceeded census retail sales by about one-fourth in each of the census years 1954, 1958 and 1963. Moreover, taxable sales represented about 94% of personal consumption expenditures as estimated above for these years. Taxable retail sales include taxes on the sale of certain capital goods so that some non-consumption expenditure is included in sales tax reports.

Because of changes in the coverage and rates of the Washington sales tax, adjustments have been made by the Department of Revenue to reflect the tax accruals under conditions of the 1955 tax base and at the rates then prevailing. This series is shown in Table 7, Column 1. From this series taxable sales are derived, free from difficulties associated with changes in coverage.

Personal consumption expenditures estimated for census years were then interpolated over intervening years by an index of taxable sales. In order to achieve a convergence between PCE estimated by taxable sales and census estimates for the years 1958 and 1963, the change in personal consumption between benchmark years was allocated as indicated by Columns (4), (5) and (6) of Table 8. As new census data becomes available for 1967

Table 7

Taxable Retail Sales, Washington (1955) Base

Year	Tax Accruals ($000)	Taxable Sales[1] ($millions)
1954	118,624	3,559
1955	130,512	3,919
1956	135,502	4,069
1957	140,990	4,234
1958	142,323	4,274
1959	151,531	4,550
1960	149,172	4,480
1961	157,018	4,715
1962	170,249	5,112
1963	171,187	5,141
1964	177,939	5,344
1965	196,555	5,902
1966	223,900	6,724
1967	254,715	7,649

[1] Only tax accruals are available. Taxable Sales are estimated by applying the 1955 rate, 3-1/3%. Taxable Sales = $\frac{\text{Accruals}}{0.333}$

SOURCE: Department of Revenue, State of Washington
Olympia, Washington.

Table 8

ear	(1) Personal Consumption	(2) Taxable Sales	(3) Index of (2)	(4) % Change Over Base	(5) % Change Over Base As % of Period's Increase	(6) (5) Times Increase In Personal Consumption In Period	(7) (6) Plus Personal Consumption In Base Year
954	3,748	3,599	100.00	0	0	0	3,748
955		3,919	110.01	10.01	49.82	397	4,145
956		4,069	114.33	14.33	71.33	568	4,316
957		4,234	118.97	18.97	94.42	752	4,500
958	4,544	4,274	120.09	20.09	100.00	796	4,544
958	4,544	4,274	100.00	0	0	0	4,544
959		4,550	106.46	6.46	31.85	323	4,867
960		4,480	104.82	4.82	23.77	241	4,785
961		4,715	110.32	10.32	50.89	516	5,060
962		5,112	119.61	19.61	96.70	980	5,524
963	5,557	5,141	120.28	20.28	100.00	1013	5,557
1963	5,557	5,141	100.00				5,557
1964		5,344	103.95				5,777
1965		5,902	114.80				6,379
1966		6,724	130.79				7,268
1967		7,649	148.78				8,268

the PCE estimates for 1964 through 1967 can be revised to converge without discontinuity upon the new benchmark.

Summary and Evaluation

This paper reports on the retail sales method used to derive personal consumption estimates by year for the State of Washington, 1954-1967. The following table compares these estimates with those developed in other sources.

Table 9

Personal Consumption Estimates for Washington State
($Millions)

Year	Romans' Savings Method	HERP Per Capital Method (Scheme II)	Wash. I/O Estimate	Retail Sales Method
1953	3,973			----
1954				3,748
1955				4,145
1956				4,316
1957	4,752			4,500
1958		5,274		4,544
1959				4,867
1960				4,785
1961				5,060
1962				5,524
1963		6,829	6,100	5,557
1964				5,777
1965				6,379
1966				7,268
1967				8,263

Interestingly, the retail sales method for estimating Washington personal consumption expenditure generates levels which are consistently lower than estimates by other techniques. It does not follow that the measures presented here understate the magnitude of this variable. The estimates prepared by Romans, HERP, and the Washington Input-Output Study are founded on a statistical basis which, while different, doe not appear inherently stronger than the retail sales blow-up method employed in this report. Mention has already been made of the fact that the HERP estimates of Washington PCE for both 1958 and 1963 exceed the levels of personal disposable income received for those years as reported by OBE.

One clue toward explaining the low-side estimates of PCE by the retail trade blow-up method appears in the unusually low service trade receipts reported for Washington in the Census of Business. Washington has consistently shown low service sales during the past three census years relative to personal income. Also, Washington trade receipts, as a percent of the national total, have consistently declined. Although per capita income in Washington is above the national average (and therefore would be expected to evidence a shift toward services), service receipts per capita have been lower in the state than in the nation as a whole.

These trends are shown in Table 10.

Table 10

Selected Measures of Washington Service
Trade Receipts Relative to U. S.

	1954	1958	1963
1. Washington Selected Service Trade Receipts as a % of U.S.	1.63	1.34	1.22
2. Washington Personal Income as % of U.S.	1.75	1.71	1.68
3. Washington Per Capita Income as % of U.S.	112	108	107
4. Washington Service Receipts Per Capita as % of U.S.	90	85	75

An earlier investigation of the role of the service industries in the Washington economy observed these same trends:

> "Sales receipts of selected service industries on a per capita basis are considerably lower for Washington State than for the United States as a whole. This occurs in spite of the fact that per capita income for Washington is higher than per capita disposable income for the United States as a whole . . . . The conclusion no doubt rests with the choices made by the Washington consumer. His mix of expenditures consists of more goods relative to service expenditures than does the 'average' U. S. consumer, and the possibility exists that his propensity to save is higher than the 'average' U. S. consumer."[8]

Since the Census of Business coverage of "selected services" includes only those establishments in SIC 70's and excludes legal, medical, educational

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[8] Omer L. Carey et al, Trends in Distribution, Services and Transportation With Particular Reference to the State of Washington, Chapter 3: "Some Factors Affecting Employment in the Distribution and Service Industries," by R. D. Tousley and A. A. Montgomery (Pullman, Washington: Washington State University, Bureau of Economic and Business Research, November 1965), p. 125.

and other higher-income-type services, the possibility exists that blow-ups based on the reported services are biased downward. Washington consumers may be spending relatively more on the unreported services. Since reported selected services nationally cover slightly less than 30% of total services reported in the national expenditure accounts, the possibility of an unrepresentative base for extrapolation to the whole should not be overlooked.

It is not possible to test this hypothesis for Washington state directly, but an examination of employment and earnings in Washington State provides indirect evidence that services play a lesser role (relative to the national average)in Washington State. Table 11 shows comparisons of the service share of total state employment and personal income. For comparative purposes the corresponding national ratios are shown. The proportions of employment and personal income in Washington service industries are consistently less than in the nation. Since the definitions of "service" in these measures is considerably broader in scope than the services covered in the Census of Business, the inferences derived from the latter set of data appear to hold for a broader range of services' activities.

For each of the comprehensive measures of service activity, location quotients (LQ's) have been computed. LQ's are indexes useful for comparing a region's percentage share of a particular activity with its percentage share in the nation. The LQ's for Washington State employment and personal income are consistently less than one. In certain applications, such LQ values might be interpreted to imply import dependence. However, service industry activities are highly localized, and it seems more appropriate, for

Table 11

SERVICE INDUSTRY INCOME AND EMPLOYMENT IN U.S. AND WASHINGTON AS PERCENT OF TOTAL

PERSONAL SERVICE INDUSTRY INCOME AS % OF TOTAL

Year	U.S. as % of Total U.S.	Wash. as % of Wash. Total	LQ
1954	6.1	5.0	0.82
1958	6.6	5.5	0.83
1963	7.6	6.0	0.79
1967	8.0	6.9	0.86

$$LQ = \frac{\text{Personal Income from Services (Wash)} / \text{Total Personal Income (Wash.)}}{\text{Personal Income from Services (U.S.} / \text{Total Personal Income (U.S.}}$$

U.S. Sources: Survey of Current Business, August 1956-58, July 1965; Business Statistics 1967.

Wash. Source: Survey of Current Business, Chart from August issues.

SERVICE INDUSTRY EMPLOYMENT AS % OF TOTAL

Year	U.S. as % of Total U.S.	Wash. as % of Total Wash.	LQ
1954	10.0	8.8	0.88
1958	10.8	9.1	0.84
1963	12.3	10.6	0.86
1967	13.5	11.6	0.86

$$LQ = \frac{\text{Service Industry Employment (Wash.)} / \text{Total Employment (Wash.)}}{\text{Service Industry Employment (U.S.)} / \text{Total Employment (U.S.)}}$$

U.S. Sources: Handbook of Labor, 1968, Table 33; Business Statistics 1967.

Wash. Sources: "Labor Force and Employment in Washington State," State of Washington Employment Security Department

PROPERTY PERSONAL INCOME AS % OF TOTAL

Year	U.S. as % of Total U.S.	Wash. as % Of Total Wash.	LQ
1954	12.4	11.2	0.90
1958	12.7	11.9	0.94
1963	14.0	12.6	0.90
1967	14.3	12.6	0.88

$$\frac{\text{Property Income (Wash.)} / \text{Total Personal Income (Wash.)}}{\text{Property Income (U.S.)} / \text{Total Personal Income (U.S.)}}$$

U.S. Sources: Business Statistics 1967; Survey of Current Business, May 1969, September 1968.

Wash. Sources: Chart from Personal Income By States; Survey of Current Business, August issues.

this industry, to interpret the low LQ ratios as indicative that Washington production and consumption of services is considerably less than would be expected on the basis of national patterns.

Since a portion of national services is composed of the actual plus imputed net rental value of dwellings, is it possible that this component of services in Washington is relatively more important, and offsets the low ratios of production, income, and expenditure of services reported in the evidence above? Are Washingtonians spending on housing services that income not spent for other services? The income statistics for states do not identify the rental income component of personal income. This statistic is merged with dividend income and interest income into an aggregate called property income. As shown in Table 11, property income is a relatively smaller component in Washington State income than it is in national income. It is unreasonable to conclude that housing services in Washington could be consumed at such a rate to alter the inferences already suggested concerning the role of personal services in the state.

The evidence is rather persuasive that personal consumption expenditures for services in Washington State are relatively less than that for the nation as a whole. It is limited by the possibility that Washington residents import from other areas an unusually high rate of service for consumption. There is no evidence to support this. There is also the possibility that the statistical evidence which does point to lesser consumption expenditure is consistently biased by underreporting or underestimating in the numerous sources drawn upon: This is another hazard lacking any validation whatsoever.

Relatively lesser rates of income, production, sales and consumption of services in the Washington economy will undermine techniques for estimating Washington PCE which rely upon allocations of national or regional aggregates to estimate PCE in Washington State. To varying degrees and in different ways the estimates of Romans, HERP and the Washington Input-Output Studies have relied upon allocative patterns to infer Washington PCE. Of course, so does the retail sales blow-up procedure used in this study. But in view of the different results obtained, it appeared desirable to examine in some detail the most vulnerable portion of the estimating procedure when using retail sales. The results appear reasonable in the light of corroborative evidence.

Expenditures for Automobiles and Parts, State of Washington

Data is not directly available reporting Washington consumers expenditures for Automobiles and Parts. Because this is a significant item of consumer expenditures and because for Washington consumers it is almost entirely an expenditure for imported goods, an effort is made to estimate magnitudes for this durable good expenditure.

The definition of "Automobiles and Parts" in the national income and product accounts is indicated by the components which make up this series; these are:

	($Billions) 1963 Consumer Expenditures
New cars and net purchases of used cars	21,549
Tires, tubes, accessories and parts	2,707
Autos and Parts	24,256

Source: The National Income and Product Accounts of the U. S., 1929-65, A Supplement to the Survey of Current Business, Tables 2.5 and 2.3.

These expenditures are reported nationally at market prices, and include expenditures for both new domestically produced automobiles by consumers as well as consumer imports. Also included are net purchases of used cars. Washington State does not produce passenger cars at all, and has only minor production of tires (mainly recapping), accessories, and parts. Net purchases of used cars would be a significant item for local production but it is small in relation to total auto expenditures. It would not be correct, however, to report all of Washington's share of expenditures for Autos and Parts as imports into the state. The market value of new cars includes the retail markup of local dealers. Efforts will be made later to determine the import content of consumer expenditures. This report is concerned only with the estimating procedures employed to obtain a total expenditure estimate by Washington consumers for Autos and Parts.

The procedure employed is fairly simple. New car registrations are available by year for both Washington State and the United States.[9] The ratio of Washington to U.S. registrations is applied to U.S. consumption expenditures reported in the national income and product accounts to estimate expenditures by Washington consumers.

While it is believed that the method employed should produce a satisfactory estimate of Washington consumer expenditures for Autos and Parts,

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[9] See Automotive Industries, A Chilton Publication, March 15th issues annually, which reports new car registrations by R. L. Polk & Co.

there are several caveats. The new car registration data for Washington and the U.S. apply to passenger cars only and not to trucks, motorcycles or other vehicles which might be purchased by consumers, and whose values are included in the national Autos and Parts expenditure total. Moreover, new car registrations in Washington do NOT include new registrations of used cars. Because of net in-migration, it may be expected that the stock of consumer automobiles in Washington, and the total registrations, would increase at a somewhat faster rate than the rate at which new cars are registered. However, the purpose of the series being constructed is not to measure the stock of automobiles held by consumers, but current expenditures. Indeed, it is for this reason that "new car registrations" rather than "total registrations" (also available) are used as estimators.

Data were not published on new car registrations for the two years of 1961 and 1962. For these two years the ratio of new registrations reported by R. L. Polk to increments in total registrations reported by the Bureau of Public Roads for 1963 and 1964 combined (a ratio of 1.53) was applied to total registrations in 1961 and 1962 to estimate new car registrations. One would expect that changes in total registrations would closely parallel the new car registration series, and therefore one could be the estimator of the other. In fact, however, the derived estimates of new car estimates for 1961 and 1962 produce gyrations in derivative series such as to cast doubt on the method. For example, the ratio of estimated Washington new car registrations to U.S. new car registrations swings outside the limits of prior or subsequent experience. This erratic behavior suggests that regressions fitted to the Washington automobile expenditures series omit

Table 12

Estimates of Consumer Expenditures for Autos and Parts
State of Washington, 1954-1968

(1)	(2)	(3)	(4)	(5)	(6)
Year	New Passenger Car Registrations (000)		Wash. as % of U.S.	U.S. Expenditures For Autos & Parts ($Billions)	(4) x (5) Est. Wash. Expenditures ($Millions)
	Washington	U.S.			
1954	64	5535	1.14	13.6	156
1955	89	7169	1.24	18.4	229
1956	76	5955	1.28	16.4	209
1957	74	5982	1.24	18.3	226
1958	58	4650	1.25	15.4	192
1959	76	6041	1.26	19.5	247
1960	71	6577	1.08	20.1	218
1961	127[e]	5855	2.17[e]	18.4	399[e]
1962	52[e]	6939	0.75[e]	22.0	165[e]
1963	86	7557	1.12	24.3	275
1964	89	8065	1.10	25.8	283
1965	98	9314	1.05	29.9	315
1966	116	9008	1.29	29.8	384
1967	112	8362	1.34	30.4	408
1968	118	9404	1.25	36.6	461

[e]Based on change in total registrations.

the years 1961 and 1962. It is possible that the Seattle Worlds Fair of 1962 induced unusual population and income movements preceding and succeeding the Fair and these are being reflected in the automobile statistics of those two years.