Spending differences across occupational fields

Multivariate analysis reveals that income is the most significant factor in determining levels of various expenditures; occupation and education also play a role

Robert Cage

Since the late 1940's, the U.S. labor force has undergone several substantial changes affecting its composition and structure. Female participation has grown rapidly since World War II, and consequently, there are more dual-earner families.[1] Growth of the suburban population has contributed to increased commuting time to and from work. And although average weekly work hours have decreased for the civilian labor force, the average American household has less time available for leisure activities:

> . . . the amount of leisure time enjoyed by the average American has shrunk 37 percent since 1973. Over the same period, the average work week, *including commuting*, has jumped from 41 hours to nearly 47 hours. In some professions, predictably law, finance, and medicine, the demands often stretch to 80-plus hours a week. Vacations have shortened to the point where they are frequently no more than long weekends. And the Sabbath is for, what else, shopping.[2]

According to the same source, the course of the rat race has led to less time available for family activities, increased consumption of service-oriented items, and more labor-saving gadgetry. This increased demand for services is reflected in the change in employment by occupational group. Projections by BLS indicate that employment by the year 2000 will increase most for service workers and least for operators and laborers. (See table 1.)

Does the shift in employment towards service workers have any implications regarding consumption? In other words, does occupation as a demographic variable affect the level and distribution of consumption for any given expenditure category? Do white-collar workers, for example, spend differently than blue-collar workers, or are these distinctions becoming antiquated? Does one's working environment have a measurable effect on one's perception of social class, formation of tastes and preferences, and, consequently, spending patterns? The purpose of this article is to compare and contrast various occupational groups to investigate what effect, if any, occupational status has on family expenditures for certain goods and services after controlling for income, education, number of earners, and other demographic variables.

Background

It is well documented that, throughout a person's life cycle, permanent income has a significant effect on consumption.[3] Age also influences consumption with respect to the nature of the bundle of goods and services an individual consumes. As one ages, tastes and preferences are likely to change, as are such needs as medical care and transportation. Not much attention has been given to the study of the effects of occupational status, a *means* of obtaining income, on consumption behavior. Perhaps this is because such a study is more a sociological question of tastes and preferences than an economic question of constraints on opportunities.

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In developing variables for their analysis of consumer demand, H. S. Houthakker and Lester D. Taylor observed that the effect of occupation, or more generally, social class, on consumption is usually less obvious than that of other factors.[4] Of course, developing an appropriate measure of social class is inherently difficult. Sociologists define the "classes" as social strata sharing essential economic, political, or cultural characteristics. In this regard, income, education, and occupation are arguably factors which influence one's position in society: income determines economic power or budgetary constraints, while education and occupation contribute to the formation of preferences and cultural characteristics.

Even after controlling for income and education, expenditures for certain goods and services are affected by occupational factors.

Income, education, and occupation, however, are interrelated. Human-capital theorists have long argued that individuals can, by foregoing earnings and obtaining higher levels of education, augment the quality of their labor services in such a way as to raise their future market value.[5] It is typically believed, therefore, that more educated individuals attract higher wages.[6] Also, at least one authority maintains that on-the-job training may be just as significant as formal schooling in determining an individual's labor productivity and market value.[7]

An in-depth technical discussion of the relationships among education, occupation, and income is beyond the scope of this article. However, distinguishing education levels and income levels among different occupational groups is important in understanding the spending patterns associated with various occupations. It may be that members of the same occupational group are characterized by similar educational attainment and income level. For example, intuitively, one might expect managers and professionals, or white-collar workers in general, to have higher incomes and higher levels of education than blue-collar workers such as operators and laborers. If so, the question then would be whether these differences account for any differences in spending between the two groups. It is hypothesized in this article that, even after controlling for income and education, expenditures for selected goods and services such as food, transportation, housing, reading materials, entertainment, occupation-related items, and apparel are directly affected by the circumstances surrounding one's occupational environment and job field. An analysis of the distribution of total expenditures will be used to determine any differences in spending behavior among different occupational groups, while a multivariate tobit regression (see later) will be employed to pinpoint the effects of occupational status alone on the expenditures.

Data and demographics

The BLS Consumer Expenditure Survey provides an excellent source of household data for cross-sectional studies. The survey collects expenditure data which provide a continuous flow of information on the buying habits of American consumers. The data are used in a wide variety of research endeavors by Government, business, labor, and academic analysts. The survey consists of two components: a diary survey and an interview survey. The data used for this article are from the 1986 and 1987 interview surveys.[8]

It is important to note that the reference group in the Consumer Expenditure Survey is a consumer unit[9] and that the income and expenditure data are those of the entire consumer unit, or household. Data for individual or personal expenditures are not available. The sample of consumer units was divided into occupational groups based on the occupation of the reference person.[10]

Five occupational groups were compared: managers and professional specialists; technicians, sales, and administrative support; precision production, craft, and repair workers; operators and laborers; and service workers.[11] Specific occupations are classed into these groups by the Census Bureau and are commonly used in producing labor market data at BLS. Managers, professionals, technicians, and sales and administrative support personnel are generally considered employed in white-collar fields, while precision production workers, craft and repair employees, operators, and laborers are

Table 1. **Employment by occupation, 1986, projection to 2000 (moderate alternative), and percent change**

[Number in thousands]

Occupation	1986	2000	Percent change
Service workers	17,536	22,917	30.7
Managerial and professional specialty	24,121	30,808	27.7
Technicians, salesworkers, administrative support	36,183	43,594	20.5
Precision production, craft, and repair	13,924	15,590	12.0
Operators, laborers, farmers, forestry	19,556	20,117	2.9

SOURCE: George T. Silvestri and John M. Lukasiewicz, "A look at occupational employment trends to the year 2000," *Monthly Labor Review*, September 1987, pp. 46–63.

considered blue collar. Service workers have developed into a third distinct group comprising such occupations as firefighters, police officers, food preparation and service workers, dental assistants and health aides, and cleaning and personal care service workers.

Analysis was restricted to salaried workers and wage earners and excluded self-employed workers for two reasons. First, salaried workers and wage earners comprise 91 percent of all workers in the sample, and second, many different occupations are lumped together in the self-employed category. Thus, it would have been difficult to interpret any results with respect to differences caused by specific occupational fields. Two years of data were used to ensure a large enough sample size for each of the groups under investigation.

Table 2 shows some selected characteristics, including income and percent distribution of total expenditures, for the five salaried and wage earner groups. Managers and professionals make up 32 percent of all salaried workers and wage earners, with service and craft and repair workers having the smallest representation, at about 10 percent each. The blue-collar groups of craft and repair workers and operators and laborers have the largest consumer units with an average size of 3.1 and 3.0 persons, respectively, while the households of white-collar and service workers are smaller, with an average of 2.6 persons each.

Chart 1 illustrates the relationship between income and education for the five salaried and wage earner groups. Although there is a trend which suggests that income is greater as educational level increases, the two variables are not perfectly correlated for the groups. Managers and professionals represent the greatest deviation from the mean, with an average income of $42,000 and 80 percent having obtained a college education. Although both white-collar groups are characterized by higher educational attainment, average income for technicians, salespeople, and administrative support personnel is less than that of craft and repair workers.

A study by the Conference Board and the Census Bureau on discretionary income, or "spare cash," reports similar findings. According to that study, the second strongest determinant of discretionary income, after household income, is education. Certain occupations are associated with high levels of education and income. More than half (53 percent) of all households headed by a person in a professional or managerial job have discretionary income. But still, 27 percent of all households with discretionary income are headed by an individual in a blue-collar, farm, or service job.[12]

The spending power of the five groups is also represented by the market value of an owned home and the ratio of total expenditures to income. Managers and professionals have the highest percentage of homeownership, while the majority of service workers are renters. Although managers and professionals and craft and repair workers have roughly the same percentage of homeownership (about 66 percent each), the estimated market value of an owned home for managers and professionals is almost twice as high.

The ratio of total expenditures to income before taxes is around 87 percent for technicians, salespeople, and administrative support personnel, as well as for both blue-collar groups, while the ratio for service workers is considerably higher at 97 percent and for managers and professionals, considerably lower at 80 percent. Although this does not necessarily indicate the level of saving for any of the groups, it emphasizes the higher income of managers and professionals. Almost all of the average income after taxes of the other groups, especially service workers, is absorbed by the expenditure categories, while only 80 percent of managers' and professionals' average income is used for that group's expenditure needs. This indicates that a greater share of the average income of managers and professionals is available for investments, such as second or vacation homes, financial securities, or savings. Property income, of which a large part is interest and dividends, is greatest for managers and professionals, supporting this conjecture.

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Shares analysis

In terms of average dollar amounts, managers and professionals spend more on all major expenditure categories. The percent distribution of total expenditures is more useful, however, in determinining any difference in consumption patterns across the five occupational groups. A chi-square test of proportions was used to measure the significance of mean expenditures as a proportion of total expenditures for one group compared to the average of the others. This was done for all major expenditure categories and for more specific items for which occupational status was hypothesized to influence expenditures.

The results of the test are listed in table 2. An asterisk (*) on an expenditure category indicates that the share of total expenditures distributed to that category was significantly different, at the 99-percent confidence interval, from the average of all other groups. For example, service workers spend 16.5 percent of total expendi-

tures for food, which is significantly higher than the average of any other salaried and wage earner groups.

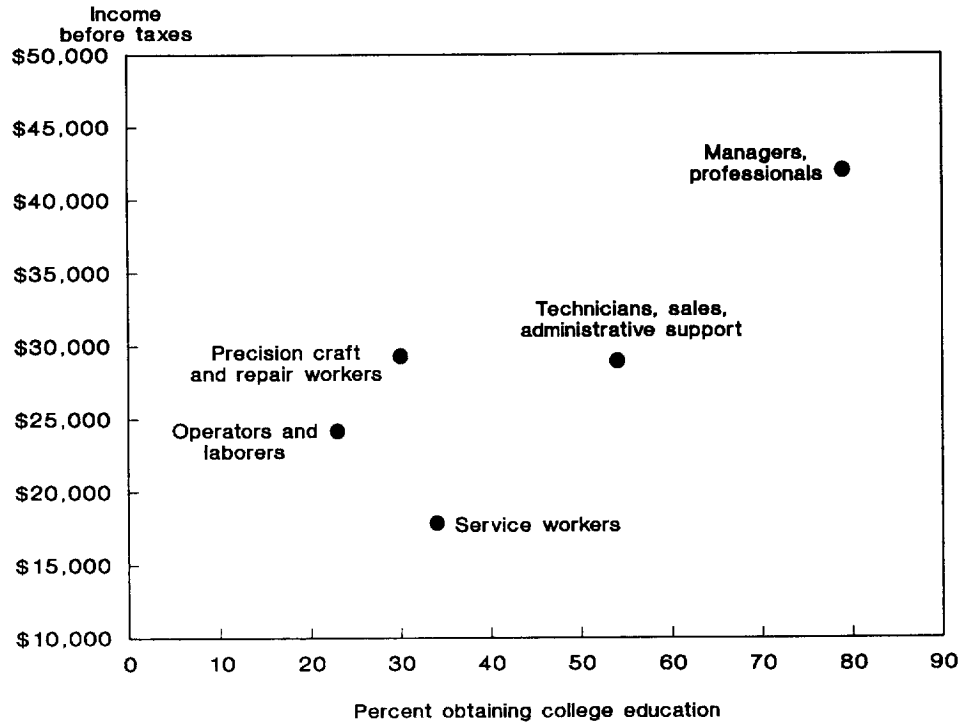
Thus, the cost for food as a share of total expenditures is lower for managers and professionals and higher for service workers and operators and laborers. Because service workers report the lowest average income, the data support Friedrich Engel's contention that a higher share of the income of poorer households goes to food

Table 2. **Selected characteristics and percent distribution of total expenditures of salaried workers and wage earners, Consumer Expenditure Survey, interview survey, 1986–87**

Item	Managers and professionals	Technicians, salesworkers, administrators	Service workers	Production, craft, and repair workers	Operators and laborers
Number of consumer units (thousands)	20,123	16,686	6,503	6,449	12,610
Percent of total salaried workers and wage earners	32.3	26.8	10.4	10.3	20.2
Consumer unit characteristics:					
Income before taxes	$42,021	$28,590	$17,848	$29,289	$24,172
Income after taxes	37,620	25,661	16,449	26,491	22,047
Average number of persons in consumer unit	2.6	2.6	2.6	3.1	3.0
Age of reference person	40.9	38.9	40.2	38.6	39.0
Average number of vehicles	2.3	2.0	1.6	2.7	2.4
Percent reporting:					
Homeownership	67	55	43	66	58
Black	7	11	21	7	12
Education level:					
Elementary (1–8)	1	2	12	8	10
High school (9–12)	20	44	54	61	66
College	79	54	34	30	23
Estimated market value of owned home	$73,165	$45,731	$29,149	$45,111	$33,827
Average annual expenditures	$33,592	$24,772	$17,311	$25,185	$20,828
Food	*13.05	14.33	*16.51	15.04	*16.20
Food at home	*8.13	9.65	*11.96	*10.94	*12.10
Food away from home	*4.92	4.68	4.54	*4.09	*4.11
Alcoholic beverages	1.17	1.29	1.28	1.18	1.29
Housing	30.52	30.22	31.05	*27.96	*28.55
Owned dwellings	*11.87	9.80	*8.01	*9.60	*8.71
Rented dwellings	*4.25	*6.61	*9.54	*5.05	*6.31
Other lodging	*2.32	1.81	*1.01	*1.49	*1.07
Apparel and services	5.64	5.55	5.18	*4.65	*4.71
Men, 16 and over	*1.24	1.07	.85	.89	.92
Women, 16 and over	*1.96	1.95	1.64	*1.33	*1.38
Transportation	*20.15	21.23	20.91	*23.73	*23.05
Vehicle purchases	10.02	10.05	9.67	*11.61	10.62
Gasoline and motor oil	*3.18	3.89	4.44	*4.99	*5.21
Public transportation	*1.36	1.11	1.04	*.59	*.62
Health care	3.35	3.66	*4.00	3.51	3.62
Entertainment	5.32	4.91	*4.39	5.49	4.76
Fees and admissions	*1.67	1.43	*1.02	1.19	*.98
Television, radios, and sound equipment	1.65	1.61	1.83	1.74	1.85
Personal care	.84	.92	.99	.78	.85
Reading	.66	.58	.50	.49	.50
Education	*1.86	1.46	1.29	*1.02	*.90
Tobacco products and smoking supplies	*.57	.94	*1.41	*1.30	*1.58
Miscellaneous	1.88	2.10	1.72	*2.60	2.07
Cash contributions	*3.56	2.63	*2.05	*2.08	*1.94
Personal insurance and pensions	*11.43	10.17	*8.72	10.18	9.95
Life and other personal insurance	1.22	1.17	1.18	1.27	1.25
Retirement, pensions, Social Security	*10.20	9.00	*7.54	8.91	*8.69

* Chi-square test of proportions was significant at the 99-percent confidence interval for this line item. See N. M. Downie and R. W. Heath, *Basic Statistical Methods* (New York, Harper and Row, 1974), pp. 200–01.

Chart 1. **Correlation between income and education for wage and salary earners, Consumer Expenditure Survey, 1986 and 1987 Interview Surveys**



than is the case for richer households.[13] Also, the average size of households headed by craft and repair workers or operators and laborers is larger than those headed by managers and professionals and technicians, salespeople, and administrative support personnel, and therefore, those households require greater expenses for food.

Food away from home, in contrast, is highest for managers and professionals and lowest for the blue-collar groups. This can be explained, in part, by the fact that managers and professionals are likely to eat at more expensive restaurants than those that blue-collar workers patronize. It is also possible that, in general, managers and professionals eat out more often than do blue-collar workers.

The share for rented dwellings is highest for service workers, reflecting the high percentage of renters in this group. On the other hand, the share for owned dwellings is highest for managers and professionals, as is that for other lodging, indicating a greater probability on the part of that group's families to incur expenses for vacation homes and lodging while out of town.

Managers and professionals also spend a higher share of income on men's clothing than all other groups, due to the preponderance of suits purchased as working attire. The share for women's clothing is higher as well, with a greater percentage reporting expenses for dresses, coats, and furs.

Transportation expenditures were higher for the blue-collar groups at 23 percent of total expenditures, significantly more than the 20-percent share spent by managers and professionals. Blue-collar families also allocate a much higher share of total expenditures for vehicle purchases (both new and used cars and trucks) and gasoline and motor oil. The average blue-collar worker evidently relies mostly on the automobile for transportation needs and may be commuting a greater distance to work as well, thus consuming more gasoline. The average number of vehicles owned by families headed by craft and repair workers and by families headed by operators and laborers is 3.0, much higher than the figure for the other groups. Some transportation expenses of managers and professionals and salesworkers are likely to be reimbursed by their employer as business expenses—particularly costs for gasoline. Also, the use of a company car may contribute to the lower share of total transportation expenses for managers and professionals.

Another reason for the lower transportation expenditures of managers and professionals may be that a large proportion of these individ-

uals are employed in urban areas and, therefore, have public transportation at their disposal for commuting needs. Ninety-three percent of all managers and professionals in the Consumer Expenditure Survey sample live in urban areas, compared to only 82 percent of the blue-collar groups. Together with the fact that managers and professionals are more likely to incur expenses related to travel, such as the cost of airline fares, the higher concentration of this group in urban areas might explain the greater share they spend for public transportation.

Income was a driving force in determining all expenditure levels investigated; occupation and education were significant for most items.

Managers and professionals spend a higher share than do any of the other groups for fees and admissions to sporting events and clubs. These include club membership dues, which are generally very expensive. By contrast, the share of expenditures spent for tobacco and smoking supplies is significantly higher for the blue-collar groups and lower for managers and professionals.

Finally, costs of education, cash contributions, and monies allocated to retirement funds, pensions, and Social Security are significantly higher for managers and professionals compared to the other groups. Interestingly, of all types of expenditures made by technicians, salespeople, and administrative support personnel, only the share allocated for rented dwellings proved to be significantly different from the average such expenditure for all the groups. This implies that, on average, this group does not distribute expenditures significantly differently from all other salaried and wage earners. Therefore, it is most representative of the "average" worker.

It is obvious from these results that differences exist among the five occupational groups, although, with respect to demographics and consumption patterns, the white-collar groups tend to be similar to each other and the blue-collar groups to each other. Chart 2 highlights the major differences in expenditure distribution among the five groups.

Regression analysis

In this section, regression analysis determines the effect occupation alone has on the probability and level of incurring an expense after controlling for variation due to income and education. Tobit analysis utilizes maximum likelihood estimation in a single equation when a set of continuous observations on a dependent variable is truncated.[14] For household expenditure data, it is more advantageous than ordinary least squares, because many households might not incur an expense for some goods and services. The data have a lower bound of zero.

Eleven different expenditure categories, listed in table 3, were chosen as dependent variables. These include most major categories for which, according to the shares analysis, the five occupational groups have significantly different mean expenditures. Among such categories are food at home and away from home, housing, transportation, apparel, reading, cash contributions, and personal insurance and pensions. Expenses for personal care and occupational expenses were also chosen, as it was reasoned that occupational status would have an effect on these items.

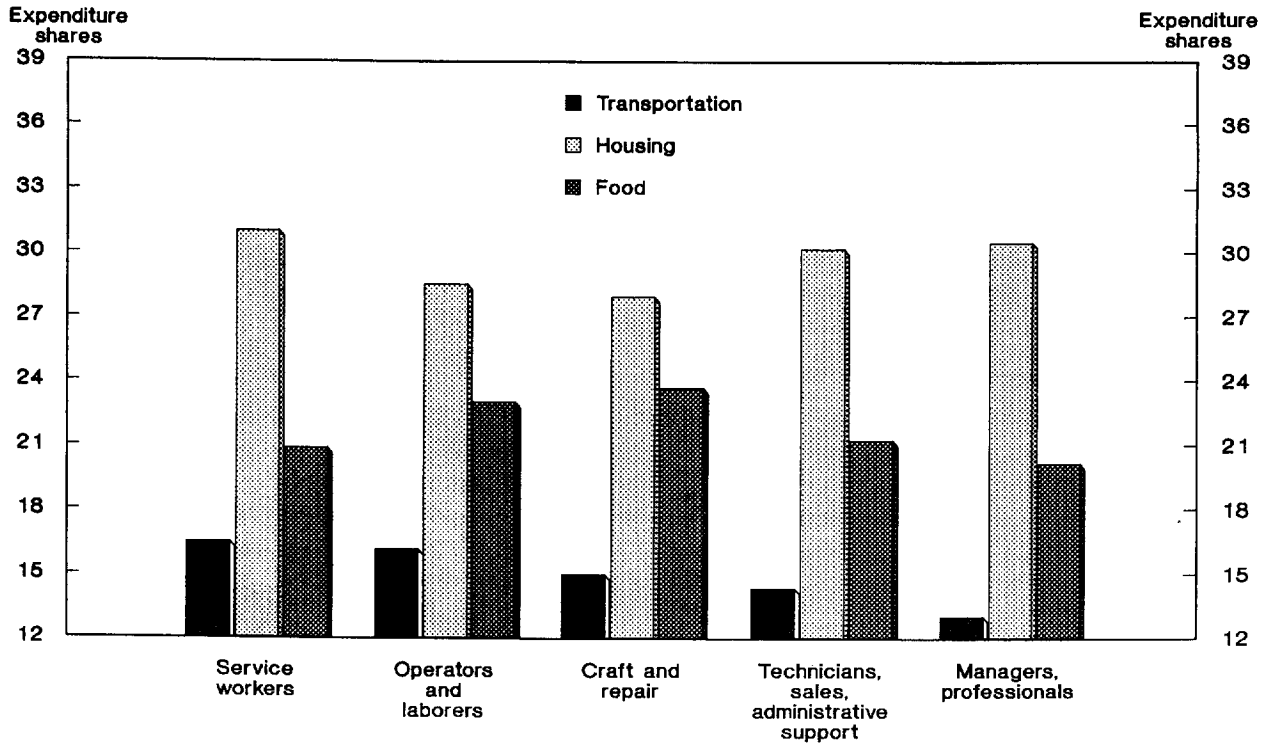
The independent, or causal, variables were chosen from the socioeconomic characteristics of the family. Dummies were created for the five occupational groups, with managers and professionals being left out of the model as the control group. Parameter estimates produced for the occupational dummies indicate the relationship of these groups to managers and professionals with respect to the probability and level of incurring an expense for the dependent variable. Education was accounted for by including dummies for the educational level of the reference person.

As mentioned previously, income is an important determinant of consumption. The category of total expenditures was used as an approximation of income in these models as a continuous variable. Total expenditures are chosen as a proxy for income primarily because (1) in the short run, families have more control over expenditures than income, and (2) total expenditures give a better fit than income in models designed to predict expenditures in a number of different categories.[15]

Because Houthakker and Taylor argue that family composition is so important that no cross-sectional analysis should ignore it,[16] dummies were included in the models with husband-and-wife-only families being the control group.

Other socioeconomic variables included in all of the models were family size (squared), age (squared), race, urbanization, housing tenure, and number of earners. The region of residence, season, and sex of the reference person were included in some of the models if it was believed that they influenced the level of expenditures for the dependent variable in question. The models produce an intercept which represents the expected quarterly expenditures for the dependent variable, before accounting for the continuous variables (total expenditures, age squared, family size squared, and number of earners), of the control group: a husband-and-wife-only family headed by a white manager or professional with some college or more educa-

Chart 2. **Shares of total expenditures for wage and salary earners, Consumer Expenditure Survey, 1986 and 1987 Interview Surveys**



tional attainment, living in an owned home in an urban area.

The sample used for the analysis was restricted to one-earner salaried and wage families, and two-earner salaried and wage families if both earners belonged to the same occupational group. This way, the family expenditures of a specific occupational group would be highlighted without introducing error caused by families whose earners belong to different occupational groups. The sample consisted of 4,101 consumer units.

The descriptive data indicated that expenditure differences exist among occupational groups. The regression analysis tests whether these differences still exist after controlling for other demographic variables. Results are listed in table 3. To test the overall significance of the set of variables included in each expenditure model, the likelihood ratio test statistic was used.[17] The resulting chi-square values were statistically significant at the 0.01 level. This allowed for the rejection of the null hypothesis that all of the coefficients (except the intercept) were equal to zero for all the models considered.

An asterisk (*) indicates that the parameter estimate was significantly different from zero at the 95-percent confidence interval, while two asterisks (**) indicate significance at the 99-percent confidence interval. The parameter estimates for total expenditures were significantly different for all of the dependent variables at the 99-percent confidence interval. This indicates that total expenditures (used as a proxy for income) has a major influence in determining the probability and level of incurring an expense for the expenditures upon which the regression is performed. In fact, total expenditures proved to be the only significant variable, along with age squared, influencing entertainment and cash contributions.

Occupation proved to be a significant variable for all of the dependent variables except apparel, entertainment, and cash contributions. This implies that income is a better predictor of the level of expense for most of these expenditure categories.

Although, as a proportion of total expenditures, service workers spend the most on food at home, the negative parameter estimate in the regression implies that they spend significantly less than managers and professionals in terms of average dollar amount. All occupational groups were less likely to incur an expense for food away from home compared to managers and professionals, except service workers, which is similar to the result obtained in the shares anal-

ysis. Household composition had a significant influence on food expenditures as well, with single consumer units more likely to have higher expenditures for food away from home while husband-and-wife families with children are more likely to eat at home. Education had little effect on the probability or level of food expenses.

All occupational groups had significant negative coefficients for housing, indicating the greater likelihood of managers and professionals incurring higher expenses for housing. Those families headed by someone with some college or more educational attainment also are more likely to have higher housing expenditures.

The much larger proportion of expenditures allocated to transportation by the blue-collar groups and service workers is reflected in the significantly positive parameter estimates for transportation expenses by these groups. Recall that these workers own more vehicles and are more likely to use them in their business.

All groups were less likely to incur expenses for reading materials and for personal insurance and pensions compared to managers and professionals. This is consistent with the shares analysis.

Table 3. Tobit regression analysis: coefficients of estimation of causal variables

Item	Food at home	Food away from home	Housing	Apparel	Transportation	Entertainment
F-statistic	211.0	52.9	203.5	76.5	215.2	60.2
Chi-square statistic	*2585.6	*816.9	*2939.1	*1525.5	*3160.2	*916.6
Adjusted R-squared statistic	0.47	0.18	0.51	0.31	0.53	0.20
Independent variables						
Constant	**424.33	**133.88	**941.28	30.75	**−1791.40	−106.91
Total expenditures	**.0194	**.0201	**.2061	**.0499	**.4250	**.0666
Occupation (managers/professionals):						
Technicians, sales, administrative support	−16.03	**−31.64	*−125.11	−12.08	**259.12	13.82
Service workers	**−47.90	−23.62	**−240.28	−28.54	**441.47	23.27
Production, craft, and repair	−20.95	*−36.55	**−232.57	−32.33	**341.28	−25.20
Operators and laborers	4.94	*−29.01	**−302.93	−7.85	**424.93	57.44
Education (some college or more):						
Some high school or less	*−29.70	*−32.69	**−186.94	*−38.19	**489.53	11.68
High school graduate	−13.02	−1.66	**−152.24	*−34.71	**338.27	−5.14
Household composition (husband and wife only):						
Single	**−203.85	*30.91	*−148.29	−31.55	**392.48	34.66
Husband and wife with children	**99.90	**−50.35	**206.45	4.45	−183.76	−15.61
Other families	−3.93	*−41.23	106.88	*−52.68	60.80	20.35
Urbanization (urban):						
Rural	**−83.37	**−42.56	**−406.26	**−58.50	**473.43	27.52
Housing tenure (owner):						
Renter	−20.81	−18.53	**−258.57	*29.24	**471.53	−7.00
Age of reference person squared	**.0338	−.0054	*−.0382	*−.0122	**−.0752	*−.0243
Consumer unit size squared	**11.28	−1.03	2.65	1.69	−7.26	−.98
Race of reference person (white):						
Black	*−38.53	**−42.04	37.96	*50.96	139.33	−44.31
Other races	35.05	3.68	−76.00	−48.29	154.30	−24.22
Season (fall):						
Winter	—	—	—	**66.06	—	—
Spring	—	—	—	−28.31	—	—
Summer	—	—	—	−11.73	—	—
Region (midwest):						
Northeast	—	—	73.17	7.85	52.92	—
South	—	—	17.57	−5.16	50.47	—
West	—	—	**186.46	−11.43	*−187.20	—
Sex of reference person (male):						
Female	—	—	52.63	**101.88	111.00	—
Number of earners	*39.08	24.12	34.33	−12.42	**−400.54	39.07
Number of vehicles	—	—	—	—	**200.56	—

See footnotes at end of table.

Table 3. **Continued—Tobit regression analysis: coefficients of estimation of causal variables**

Item	Personal care	Reading materials	Cash contributions	Occupational expenses	Personal insurance and pensions
F-statistic	58.9	40.7	43.1	13.1	119.5
Chi-square statistic	*899.5	*814.8	*821.6	*217.4	*1736.3
Adjusted R-squared statistic	0.19	0.18	0.18	0.05	0.34
Independent variables					
Constant	**41.2	**27.39	**−277.83	*−20.19	**275.4
Total expenditures	**.0027	**.0025	**.0590	**.0024	**.0636
Occupation (managers/professionals):					
Technicians, sales, administrative support	**−5.87	**−7.31	−10.21	−1.12	**−152.57
Service workers	**−12.80	**−14.41	24.08	1.44	**−179.81
Production, craft, and repair	**−17.80	**−13.35	70.05	**43.03	**−178.23
Operators and laborers	**−15.20	*−12.65	34.33	**11.65	**−191.25
Education (some college or more):					
Some high school or less	**−11.83	**−17.16	−24.56	*−7.80	*−87.03
High school graduate	−3.81	**−11.10	−4.70	2.36	*−57.25
Household composition (husband and wife only):					
Single	**−16.23	−4.06	39.45	**12.15	−88.68
Husband and wife with children	−1.62	4.97	*−98.50	2.32	14.43
Other families	*−8.36	−1.62	−44.86	8.90	−67.35
Urbanization (urban):					
Rural	**−15.34	*−6.88	16.24	1.29	*−71.24
Housing tenure (owner):					
Renter	*−4.94	*−4.20	44.71	−3.54	**−203.96
Age of reference person squared	**.0049	**.0049	**.0500	.0013	.0201
Consumer unit size squared	.51	−.13	−.26	.42	**−6.58
Race of reference person (white):					
Black	**14.40	*−6.84	28.64	−1.15	−14.53
Other races	*−10.33	2.58	−10.19	.30	**172.71
Season (fall):					
Winter	—	—	—	—	—
Spring	—	—	—	—	—
Summer	—	—	—	—	—
Region (midwest):					
Northeast	—	2.48	**−104.94	—	—
South	—	*−4.21	−29.47	—	—
West	—	−3.28	−37.92	—	—
Sex of reference person (male):					
Female	—	2.37	24.96	—	−45.06
Number of earners	2.78	3.22	42.66	**11.81	**232.67
Number of vehicles	—	—	—	—	—

* Significantly different from zero at the 95-percent confidence interval.

** Significantly different from zero at the 99-percent confidence interval.

NOTE: Dash indicates that the variable was not used in the model.

The blue-collar job fields are, on the face of it, more likely to have workers who belong to labor unions and, consequently, have greater occupational expenses because of union dues. The tobit analysis reflects this intuitive assumption: both operators and laborers and craft and repair workers spend more on occupational expenses, which include the cost of union dues, tools, uniforms, and licenses and permits, than do managers and professionals.

To determine the overall significance of occupation on the dependent variables, a chi-square test was performed using the logarithm of the likelihood of the variables in the restricted model (without the occupational dummies) and the logarithm of the likelihood of the variables in the full model. (See table 4.) The test was also performed for education. The results demonstrate that, after control for education and income, occupation has a significant effect on the probability and level of incurring expenses for food, housing, transportation, personal care products, reading materials, occupation-related items, and personal insurance and pensions.

Education also is influential in predicting the level of expense for housing, apparel, transportation, personal care products, reading materials, occupation-related items, and personal insurance and pensions.

Conclusions

The shares analysis illustrated that differences exist among the five occupational groups with respect to their distributions of expenditures. The demographics and family characteristics associated with these occupational groups help explain some of the differences. The multivariate tobit analysis demonstrated that income was a driving force in determining the level of expense for all expenditure categories investigated. Occupation and education proved to have significant effects for most items; however, the only variables that occupation alone influenced that education did not were food at home and food away from home. This suggests that some occupational fields are associated with the same level of educational attainment. The data, furthermore, indicate that managers and professionals have higher degrees of educational attainment and higher incomes, on average, than blue-collar and service workers. These socioeconomic characteristics result in a greater allocation of expenditures towards housing, reading materials, pensions, and entertainment by families headed by managers and professionals, while service workers and blue-collar families are more likely to spend a larger share for food and transportation. The tobit analysis confirms these findings for the most part. Further investigation into the effects of occupational status, and even its relationship to income and education, would be worthwhile, given that the composition of the labor force is changing. An analysis of the interaction among income, education, and occupation could be employed in future research. As employment of service and white-collar workers continues to grow, and that of high-wage blue-collar positions continues to decline, changes in consumption at the aggregate level may occur. □

Table 4. Tobit regression analysis results: significance of occupation and education on selected expenditures

Dependent variable	Occupation	Education
Food at home	*12.0	4.0
Food away from home	*12.0	0.0
Housing	**30.0	**16.0
Apparel and services	4.0	*8.0
Transportation	**32.0	**38.0
Entertainment	6.0	2.0
Personal care products	**50.0	**22.0
Reading materials	**40.0	**62.0
Cash contributions	4.0	0.0
Occupational expenditures	**94.0	*8.0
Personal insurance and pensions	**52.0	*8.0

* Significant at the 95-percent confidence interval.

**Significant at the 99-percent confidence interval.

NOTE: $\chi^2 = -2$ (Log likelihood$_{Restricted}$ − Log likelihood$_{Full}$).

Footnotes

[1] See Eva Jacobs, Stephanie Shipp, and Gregory Brown, "Families of working wives spend more on services and nondurables," *Monthly Labor Review*, February 1989, pp. 15–23.

[2] Nancy Gibbs, "How America has run out of time," *Time*, Apr. 24, 1989, pp. 58–67.

[3] See H. S. Houthakker and Lester D. Taylor, *Consumer Demand in the U.S.* (Cambridge, MA, Cambridge University Press, 1970), pp. 254–57.

[4] Houthakker and Taylor, *Consumer Demand*, p. 59.

[5] See Angus Deaton and John Muellbauer, *Economics and Consumer Behavior* (New York, Cambridge University Press, 1980).

[6] See Gary S. Becker, *Human Capital* (Chicago, University of Chicago Press, 1975).

[7] See Jacob Mincer, "On-the-Job Training: Costs, Returns, and Some Implications," *Journal of Political Economy*, October 1962, pp. 50–59.

[8] Publication of the data occurred in BLS news releases 88–175 (Apr. 14, 1988) and 89–330 (July 6, 1989).

[9] A *consumer unit* is (1) a single person living alone or sharing a household with others but who is financially independent, (2) members of a sample household related by blood, marriage, adoption, or some other legal arrangement, or (3) two or more persons living together who share responsibility for at least two out of three major types of expenses—that is, food, housing, and other expenses. The terms "household," "family," and "consumer" are used for convenience.

[10] A *reference person* is the first member mentioned by the respondent when asked to "start with the name of the person or one of the persons who owns or rents this home." Other consumer unit members are then referenced to this person by their relationship to him or her.

[11] *Managerial and professional specialty occupations* include officials, administrators, financial managers, personnel and labor relations managers, purchasing managers, managers, marketing advertising and public relations administrators, administrators in education and related fields, medicine and health managers, properties and real estate managers, accountants and auditors, architects, engineers, mathematical and computer scientists, natural scientists, physicists, dentists, nurses, therapists, teachers, counselors (educational and vocational), librarians, social scientists, social recreation counselors, religious workers, writers, artists, entertainers, athletes, lawyers, and judges.