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Unemployment and Consumption: Note

By MICHAEL GROSSMAN*

According to a new approach to demand theory, households produce the commodities that enter their utility functions with inputs of market goods and their own time (see Gary Becker, Becker and Robert T. Michael, Kelvin Lancaster, Richard Muth). Provided time and goods were not employed in fixed proportions in the production of commodities, consumers would have an incentive to substitute the former for the latter if the price of their time, measured, say, by their potential real wage rate, declined. Since the incidence of unemployment causes the price of time to fall, one would expect unemployed workers to substitute their own time for market goods in the production of commodities.

In this note, I use the notion of substitution in production between goods and time to interpret data on detailed family consumption expenditures before and during unemployment. The information is contained in a survey of the insured unemployed. In particular, I focus on differences in the pattern of expenditure reductions that emerge when primary market workers are unemployed, compared to when secondary market workers are unemployed. I also examine differences in the estimated income elasticity of total consumption for claimants in low unemployment areas compared to that for claimants in high unemployment areas. A tentative part of this analysis is a computation of the reduction in total consumption due to substitution of time for goods that would occur if unemployment were fully anticipated and, hence, not accompanied by a reduction in permanent income.

I. Data and Methods

This note is based on data from six studies of the insured unemployed, conducted by the

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Bureau of Employment Security (*BES*) of the U.S. Department of Labor between 1953 and 1958.¹ The labor market areas in the *BES* sample, the dates during which each survey was conducted, and the overall unemployment rate of the area during those dates are shown in Table 1. The surveys included average monthly family expenditures before and during unemployment for eleven exhaustive components of total consumption. Data were collected from three types of claimants: single individuals, heads of four person households (primary market workers), and nonheads of four person households (secondary market workers).² There were 462 single individuals in the sample, 774 heads of four person households, and 482 nonheads. In the *BES* publication based on the surveys, the expenditure information was given in the form of area averages by claimant type. Hence, there were six observations for each claimant type.

I deflated outlays in each expenditure category by a corresponding component of the Consumer Price Index (*CPI*) (1957—59 = 100). I selected the appropriate annual deflators for before- and during-unemployment expenditures as follows. For Pittsburgh, the unemployment period occurred mainly during 1954. Therefore, deflation of outlays during this period made use of the 1954 *CPI* components. The deflators used with before-unemployment spending were chosen by applying the average duration of unemploy-

¹ For a complete description of the data, see *BES* No. U-203. Note that the *BES* is now part of the Manpower Administration.

² Although the published data did not give the sex of the claimant, most nonheads of four person households are undoubtedly wives. Since differences in the economic roles of primary and secondary market workers in the household can explain my main results, I do not emphasize differences based on a sex classification in the paper. I would like to thank Carol Breckner, Ilene J. Grossman, and a referee for urging me to adopt the primary worker-secondary worker terminology. This terminology should prevent readers from getting the mistaken impression that I am a "male chauvinist pig."

TABLE 1—THE BES SURVEY

Area	Dates	Unemployment Rate (percent)
Pittsburgh, Pennsylvania	9/53-8/54	9.4
Tampa-St. Petersburg, Florida	11/55-10/56	4.2
Andersonville-Greenville-Spartanburg, South Carolina	4/56-3/57	3.7
Albany-Schenectady-Troy, New York	5/56-4/57	3.4
Portland, Oregon	4/57-3/58	10.0
St. Louis, Missouri	4/57-3/58	9.2

ment to the midpoint date of the survey period. For Pittsburgh, the midpoint date was February 15, 1954. Since claimants reported an average duration of unemployment of 20 months, it was assumed to begin in June 1952, and outlays while employed were deflated by the *CPI* components for 1952. A similar procedure was applied to the expenditure data of claimants in the other five areas.

After deflation, I computed mean expenditures before and during unemployment by claimant type. The mean expenditure on a given item was defined as a weighted average of the six area means, where the weights were the proportion of the sample in each area.

Note that my procedure eliminated the effects on the expenditure data of price changes both during the entire 1953-58 period and during the movement from employment to unemployment in each area.

II. Differences in Head-Nonhead Expenditure Reductions

Table 2 gives consumption elasticities and marginal propensities to consume for four person families in which the head was unemployed, and for four person families in which the nonhead was unemployed. The consumption elasticity of food, for example, equals the percentage reduction in deflated family food outlays caused by unemployment divided by the percentage reduction in deflated total consumption. The marginal propensity to consume food equals the absolute reduction in deflated food outlays divided by the absolute reduction in deflated total consumption.

In comparing families in which the head was unemployed to those in which the nonhead was unemployed, I use the reduction in current consumption as an index of the reduction in permanent income due to unemployment. The reduction in current consumption is used instead of the reduction in current income because the former clearly has a smaller transitory component than the latter. Since to a large extent, unemployment causes a temporary decline in income, one

TABLE 2—CONSUMPTION ELASTICITIES AND MARGINAL PROPENSITIES TO CONSUME FOR FOUR PERSON HOUSEHOLDS WHERE HEAD OR NONHEAD IS UNEMPLOYED

Item	Consumption Elasticity		Marginal Propensity to Consume	
	Head	Nonhead	Head	Nonhead
Food	.74	.74	.22	.20
Housing and utilities	.79	.35	.17	.07
Household operations	.97	4.16	.05	.27
House furnishings	1.03	.62	.04	.02
Clothing	1.61	2.50	.09	.15
Medical care	1.45	.54	.07	.02
Transportation	1.14	.88	.17	.15
Personal care	.00	1.39	.00	.02
Tobacco and alcoholic beverages	.97	.89	.04	.02
Reading and recreation	.91	1.31	.04	.05
Other	1.77	.32	.11	.03

Note: Computed from: U.S. Department of Labor, *BES*, Tables B-2, B-6, D-3, and D-5.

would expect persons to react to it mainly by adjusting their savings.³

According to traditional demand theory, the various goods and services in Table 2 are the basic arguments in consumers' utility functions. Provided relative prices did not change when workers became unemployed, it would attribute reductions in the consumption of these goods and services solely to an income effect. If families in which the head was unemployed had the same set of permanent income or consumption elasticities as families in which the nonhead was unemployed, then the correlation coefficient between these two sets of elasticities should equal +1. In fact, the Spearman rank correlation coefficient between the consumption elasticities in Table 2 is $-.23$, and the product-moment correlation coefficient is $-.04$.⁴ Such low (and even negative) correlations are inconsistent, at least at first glance, with the hypothesis that the two claimant groups have the same set of permanent income elasticities.

Some of the differences in the pattern of expenditure reductions revealed by Table 2 are striking. Whether the dissimilarity between the two consumption elasticities for each item in the table is measured by their ratio or by their difference, household operations and clothing deserve special mention. Their consumption elasticities for families in which the nonhead was unemployed are, respectively, four times as large and one and a half times as large as the corresponding elasticities for families in which the head was unemployed. In terms of marginal propensities to consume, the differential impact of unemployment of heads and nonheads on the quantity of household operations demanded is most noticeable. The reduction in household operations for nonheads accounts for 27 percent of the reduction in total consump-

³ If the permanent income elasticity of total consumption equaled unity, then the percentage change in consumption would coincide with the percentage change in permanent income.

⁴ If the category Other Consumption is omitted from these calculations, the rank correlation coefficient is $+.02$, and the product-moment correlation coefficient is $+.12$.

tion. The corresponding figure for heads is 5 percent.⁵

The household production function approach to demand analysis provides a cogent explanation of the relatively large reductions in the quantities of household operations and clothing demanded when secondary market workers become unemployed. Its explanation is based on the proposition that the elasticities of derived demand for various market goods with respect to the price of secondary workers' time are likely to exceed the elasticities with respect to the price of primary workers' time.

For instance, the specific items included in household operations outlays are inputs, together with primary workers' time and secondary workers' time, into the production of commodities such as "cleanliness of the home," "cleanliness of the people who live in the home," and "child care."⁶ When either primary workers or secondary workers become unemployed, the price of their time falls, and an incentive is created to substitute this time for market goods in the production of cleanliness or child care. Since secondary market workers are primary nonmarket workers, the share of their time in the total cost of producing certain commodities is likely to exceed the share of primary workers' time in total cost. Thus, if the Allen partial elasticities of substitution in production (see R. G. D. Allen, pp. 503-09) between primary workers' time and market goods and between secondary market workers' time and market goods were equal, the derived demand elasticity of household operations with respect to the price of secondary workers' time would be greater.⁷ To the extent that the secondary

⁵ Although the consumption elasticity of personal care is 1.4 for nonheads and 0 for heads, the differential impact of unemployment of heads and nonheads on the quantity of this item demanded falls dramatically when marginal propensities to consume are examined.

⁶ Household operations outlays consist of 1) laundry sent out, 2) cleaning of rugs and draperies, 3) launderette and coin operated washing machine service, 4) wages and tips to domestic servants, 5) laundry soaps and cleaning supplies, and 6) fees to day nurseries, child care centers, and baby sitters.

⁷ In analyzing derived demand elasticities, I rule out substitution in consumption among commodities by as-

worker partial elasticity of substitution exceeded the primary worker partial elasticity of substitution, the difference in derived demand elasticities would be even larger.

Along similar lines, clothing and time produce commodities such as "warmth" and "style." Once again, the results in Table 2 are consistent with the hypothesis of a positive differential between the shares of secondary and primary workers' time in total cost. Presumably, in some household activities, there are negative differentials between these shares or greater partial elasticities of substitution between primary workers' time and market goods. Indeed, for the items housing and utilities, other consumption, and medical care, head consumption elasticities and marginal propensities to consume exceed the corresponding nonhead estimates. The first two items, however, consist of diverse components, and the medical care differential can be explained by the purchase of group health insurance by the head for himself and his family at his place of work. Therefore, it is not possible to use the *BES* budget studies to identify household activities in which primary workers' time and market goods are good substitutes.

It should be noted that within the context of the household production function model, the low correlation between the consumption elasticities of heads and nonheads need not imply that the two groups have different "pure" permanent income elasticities. By pure permanent income elasticity, I mean the income elasticity that would be observed if a change in permanent income were not accompanied by a change in the value of the time of one or more family members. This would occur if, for example, a family, all of whose members worked in the market, suffered an unanticipated decline in property income. Since unemployment lowers the value of time, it generates substitution as well as

suming that *relative* prices of commodities are not affected by changes in the price of time. In other words, I assume that the shares of secondary and primary workers' time in the total cost of producing a given commodity do not vary among commodities. Given the fairly aggregate nature of the items in Table 2, this is a weak assumption.

income effects. These substitution effects can go a long way in explaining the differential impact of the unemployment of primary market workers and secondary market workers on the quantities of various market goods demanded.

III. Income Elasticities of Total Consumption

Three of the *BES* studies were undertaken during years of business contraction, while the other three were conducted during years of relative prosperity (see Table 1). The three labor market areas that were surveyed during recessions had much higher unemployment rates than the other three. In this section, I compare the income elasticity of total consumption for claimants in high unemployment areas to that for claimants in low unemployment areas. Presumably, claimants in high unemployment areas were unemployed mainly for cyclical reasons. On the other hand, unemployment in the other areas was presumably due to seasonal or frictional factors.⁸

In general, it is much more difficult for workers to predict or anticipate cyclical unemployment than to predict seasonal or frictional unemployment. Hence, they would view a loss in income due to the former type of unemployment as a more serious loss than that due to the latter type. Based on this argument, unemployed workers in high unemployment areas should exhibit larger income elasticities of total consumption than those in low unemployment areas. Table 3 illustrates the truth of this proposition. For each of the three claimant types, the estimated income elasticity of consumption in high unemployment areas is approximately twice as large as the income elasticity in low unemployment areas.⁹

⁸ Since all of the members of the sample were receiving unemployment compensation benefits, it is not likely that they were unemployed for long-term or structural reasons.

⁹ The income elasticity of total consumption equals the percentage reduction in deflated family consumption due to unemployment divided by the percentage reduction in deflated family income. Note that family income during unemployment includes unemployment compensation benefits.

TABLE 3—INCOME ELASTICITIES OF TOTAL CONSUMPTION BY CLAIMANT TYPE AND UNEMPLOYMENT LEVEL OF AREA

Group	Income Elasticity
Single individuals	
High unemployment areas	.38
Low unemployment areas	.23
Heads of four person households	
High unemployment areas	.46
Low unemployment areas	.20
Nonheads of four person households	
High unemployment areas	.43
Low unemployment areas	.18

If seasonal or frictional unemployment were fully anticipated, it would cause no reduction in permanent income. This does not mean that such unemployment would have no impact on consumption. The price of time of seasonally unemployed workers would decline temporarily, and they would have an incentive to substitute time for goods in the production of commodities.¹⁰

By assuming that workers in low unemployment areas fully anticipated their unemployment, it is possible to put an upper limit on the reduction in consumption due to substitution of time for goods. If the income elasticity for heads is employed in this calculation, then a 10 percent reduction in family income due to fully anticipated unemployment would reduce consumption by 2 percent on account of the substitution effect. Put differently, the income elasticity for heads in high unemployment areas shows that if family income fell by 10 percent in a recession, consumption would fall by 4.6 percent. A little less than half of this decline would be due to the substitution of time for goods, and a little more than half would be due to the reduction in permanent income. It should be emphasized that this is an extremely tentative calculation. To the extent

¹⁰ This point has been made by Becker and Gilbert R. Ghez. Note from Table 3 that with the level of unemployment held constant, income elasticities are practically the same for each of the three types of claimants. Therefore, there is no evidence in the *BES* data that secondary market workers' time and market goods are better substitutes in *all* household activities than primary market workers' time and market goods.

that workers in low unemployment areas did not anticipate their unemployment, part of their reduction in consumption would be due to an income effect. I believe, however, that the incentive to substitute time for goods during periods of unemployment can explain at least part of the decline in total consumption during such periods.

IV. Summary and Implications

In this note, I have argued that in the production of the household commodities, cleanliness, child care, warmth, and style, secondary market workers' time and market goods are better substitutes than primary market workers' time and market goods. This explains the relatively large declines in outlays on household operations and clothing that are observed when secondary workers become unemployed. During recent decades, the labor force participation rates of married women and other secondary market workers have increased substantially. Therefore, an immediate implication of my findings is that the pattern of cyclical fluctuations in the various components of total consumption might change in the future. Given the relatively high elasticities of derived demand for various market goods with respect to changes in the price of secondary market workers' time, cyclical fluctuations in household operations and in clothing should increase in the future.

In this note, I have also argued that not all of the reduction in total consumption that accompanies unemployment can be attributed to an income effect. Instead, part of this reduction is due to the incentive to substitute time for goods in the production of commodities. Hence, even if unemployment compensation benefits offset a substantial fraction of any decline in permanent income caused by unemployment, one would expect total consumption to fall during such periods.

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