SUMMARY

Factors Influencing Buying

The overpowering determinant of what people spend on shoes is what they have to spend. Buying of this single commodity reproduces the contours of consumer income with startling faithfulness. It follows minor as well as major movements. Even the timing of turns is amazingly similar. Among other things, this most reasonable similarity for two altogether independent sets of statistics fortifies confidence in the one most likely to be inaccurate – our estimates of shoe sales, which are, after all, based on a very small sample of the total.

In general, when consumers get more income, they seem to spend a certain proportion of the increment on shoes – around 1.6 or 1.7 per cent for the period we studied; a reduction in income causes a comparable decline in the buying of even this single commodity. An alternative way of describing the relation, and we really do not know which is the more accurate, is that a 1 per cent change in income is associated with a change of .8 or .9 per cent in shoe buying.

An interfamily income elasticity of shoe buying of .75 at average family income was, we learned, suggested by the 1935-1936 income and expenditure study. Obviously, this figure could at best be highly approximate. But even were it trustworthy, its correspondence with the statistics on elasticity derived from time series would not constitute a simple verification of either, for the two figures are not directly comparable. We know, for one thing, that the size of a family is correlated with income in budget studies and strongly suspect that percentage expenditure on shoes increases with the number of feet requiring them. Thus the pure interfamily income elasticity is probably lower than the net .75 that the budget data show, providing the figure is the result of accurate reports on shoe buying by a representative sample. However, this may well not be the case, especially for the higher income families. The survey data on shoe buying are obtained by asking consumers to itemize purchases, and the probability that some purchases are overlooked must increase with the scale of living and the complexity of family structure. Were this the case, the true interfamily income elasticity might well be higher than reported.[1] The elasticity figure based

[1] We cannot put this proposition to a test, but for whatever it is worth I calculate that an estimate of aggregate shoe buying for 1935-1936 built up from the area surveys gives a lower figure ($938 million) than that based on our time series ($1,156 million); this could of course also mean not that the interfamily income regression was too flat but merely that underreporting was found throughout the range. (The computation was made as follows: the proportion of clothing expenditure composed of footwear for families was computed at the seven income levels for which data are published in National Resources Planning Board, *Family Expenditures in the United States* [1941], p. 4, Table 9. These ratios were then applied to the aggregate expenditure on clothing of families *and* single individuals, income level by income level, as published in National Resources Committee, *Consumer Expenditures in the United States – Estimates for 1935-36*

on time series, on the other hand, though not subject to the same shortcomings, is subject to others which have been discussed at length. Adjustment for some of the factors, such as income distribution and expectations, absorbed in the income parameter might lower the figure, whereas adjustment for other factors, stock for example, might raise it. In the end, then, close comparison between the two sorts of figures must be resisted, both because they are not sufficiently accurate measures of those factors which they reflect and because all the same factors are not reflected in both. At least this much may be said: Comparison of the two elasticity figures does not actually suggest any inconsistency in the pure income elasticity measurement after allowances are made for bias that may well be present.

As between expansion and contraction, our studies do not demonstrate a material difference in the marginal propensity to consume shoes; such factors as might bring this about – the negative association of shoe buying, other things the same, with the direction of change in aggregate income and its positive association with increasing equality of income distribution and optimistic expectations – tended to counteract one another for this commodity. This would not of course necessarily be the case for most other commodities; for large-unit durable goods, for example, a positive income-change elasticity might cause both factors to carry the same sign.

Average (as contrasted with incremental) relation between income and shoe buying does, on the other hand, tend to have a cyclical pattern: it is somewhat higher in bad than in good years. The proportion of income spent on shoes tends to decline as income rises, for the observed relationship between shoe buying and income is one which, if projected to a time when consumers received no income at all, would still imply shoe buying.[2]

We have spoken of the influence of aggregate income on the amount of money spent on shoes. The reduction, however, in shoe buying as income falls has, we learn from both time series and area surveys, two components – a reduction in the number of pairs bought and shifts from higher to lower priced pairs. As income rises, the opposite two changes occur. Alternating trading down and trading up seems especially characteristic of women's shoe buying. This quantity-price dimension of consumer choice is a very fascinating one; it would certainly have different manifestations for various commodities and

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[1939], p. 89, Table 31A. Expenditure on shoes by institutional residents was added: it was estimated by applying the clothing-shoe expenditure ratio for low-income families to data from *ibid.*, p. 63, Table 12.)

[2] This can be seen by contrasting the average ratio of sales to income for, say, 1929, 1937, and 1941 with 1932, 1933, and 1938. It is 1.81 and 1.95 respectively for dollar and 1.86 and 2.04 for deflated figures.

The fact could also be deduced from the equation. When the constant and the minimum value of the price ratio (not its change), which operates in effect as a constant in the equation, are jointly considered, the *Y*-intercept is positive in all years even after the downward trend is allowed for. The incidence of the other factors is not systematic with respect to major peaks and troughs.

would reward further study, especially the association of this type of sensitivity with the income sensitivity of dollar expenditure and possible stock sensitivity of demand.

Quantitatively, the influence of income towers above the rest, but there are others. For one thing, over the years 1929-1941, at any rate, factors were at work, the net influence of which was a gradual reduction of expenditure on shoes (though not in the number of pairs bought), other things the same. Our time series show the net downward trend for the 1929-1941 period averaging, *ceteris paribus,* around 1.5 per cent a year. Area surveys suggest that one component, changes in population, would impart an upward trend to shoe buying and suggest that the trend toward more even income distribution might do the same. The latter, on the basis of estimates in which little confidence could be placed, might have amounted to about one-quarter of 1 per cent a year; the progress of urbanization, on the other hand, might have a reverse impact. Nevertheless we know, from developments in industry in general and the shoe industry in particular, that there were reasons why the bundle of utilities called a pair of shoes would have difficulty keeping an even hold on the consumer's dollar in the face of the ever-increasing bundle of utilities supplied by other goods and services. Both analysis of these factors and the doubtful evidence of the time series suggest that the net trend for the 1929-1941 period would not necessarily apply to other times. These lessons are thought-provoking, for they might be expected to be duplicated for other commodities, and carry interesting implications concerning analytic problems for aggregate consumption and saving.

Though no evidence other than that of time series is available and this evidence is, because of the actual course of the ratio, not as trustworthy as one would wish, the data tentatively indicate that when shoe prices rose out of proportion to other living costs, the physical volume of shoe buying was cut, other things separately accounted for, but very much less than proportionately.

A group of other factors may also play some part in the temporal pattern of aggregate shoe buying in spite of the fact that for the period covered we cannot measure them at all adequately, but it seems reasonably clear that their individual and combined effect was very small indeed compared to that of the imperious hand of aggregate income.

People may cut the purchase of this basic good, shoes, less when income falls by a given amount than they raise it when income rises by the same amount, but such studies as have been undertaken suggest that shoes would be a marginal commodity in this respect. Our time series analysis does not deny that the income-change elasticity for shoes, more likely perhaps to be negative than positive, is not far from zero.

Budget studies suggest that a shift in income toward the low-income urban worker might stimulate sales somewhat, but our efforts to isolate this factor in time series proved largely unsuccessful, though the very short term shifts –

the only ones that could be isolated at all – carried at least the correct sign in the multiple regression analysis. The same thing might be said of the positive influence of optimistic expectations that is suggested by introspection, but in this case budget studies have no information to contribute.

Still more unsatisfactory has been our ability to learn how the size of consumer stocks of shoes influenced shoe buying. In spite of a most painstaking investigation of the matter, virtually no evidence of the influence of consumer shoe stocks has been isolated. Logical analysis suggests that, if it has any influence apart from the factors that determine the willingness of individuals to satisfy their requirements at one time rather than another, it would be considerably more likely to emphasize the smaller fluctuations in shoe buying relative to the larger ones than to damp them. This might result from a tendency to dampen the larger ones (because of the inverse impact of the major swings in stock which parallel those of buying and income for semidurable commodities) rather than the result of generation, however, faint, of minor ones (via echo waves), though the latter possibility is also not disbarred. However, to repeat, no evidence that this has actually occurred has been developed.

It is interesting to consider, too, that longer lived goods would have considerably less likelihood of showing either influence. For, on the one hand, the concept of depreciation approaching a "sudden death" formula, which is necessary to a clear echo wave, violates reality for highly durable goods; consequently no replacement cycle is likely. On the other hand, stocks of a good that lasts two or three years bridge the valleys and peaks of all but exceptionally long phases of the "forty-month" cycle and therefore would have little regular tendency to damp the major cyclical swings in buying. Indeed it is possible that changes in the stock-objective, which for such goods must be strongly and positively associated with what others have been known to buy – total stocks viewed as those of others[3] – might be the dominating factor in the three-branched stock impact, causing the stock-influence to parallel and therefore augment the major swings in buying, and perhaps tend to accentuate and even prolong at least some of them.[4]

The net effect of those aspects of income distribution, of expectations, and of stock not absorbed in the other variables seems in general to accentuate minor fluctuations in consumer shoe buying, other things (including the trend or major cycle component of these influences) separately accounted for. At least, the accentuation does seem present in the time series. We saw it at the outset of the analysis by simply comparing the amplitude of movements associated

[3] The weighting system of past sales appropriate to constructing a series depicting stocks of others may well not be the same as one appropriate to depicting the aggregate stocks owned by each prospective buyer.

[4] A provocative difference among the time series on sales of departments of department stores comes to mind in this context. Sales of the rug and furniture departments, unlike the others, seem to maintain a rate of rise or fall without prior retardation until very close to the actual peaks or troughs (see Chart 5).

with the major and minor fluctuations for both consumer income and shoe sales. The measures suggested an income elasticity figure that was about half again as high for minor movement as major ones. In part, the difference between income and sales in the relative strength of the two sorts of movements is doubtless due to technical factors that are economically meaningless. Also, I would not exclude the possibility that different income elasticities do actually apply to income, depending on the duration and severity of change. But probably, too, the difference reflects the impact on buying of other factors that stimulate short waves in buying. Yet we have met with very little success in demonstrating their contribution, and the short waves remain in the unexplained residuals. What is more, I would not expect this difficulty to be found in shoe buying only. For durable goods – though the stock-influence could not, as in the case of shoes, cause short waves – the direction of change in income would tend to have a positive association with buying and thus pull in the same direction as short-term shifts in income distribution or expectations. Consumption or savings functions have very generally underestimated rates of change in the dependent variable.

Finally, from time to time special circumstances seem to have prevailed that caused shoe buying to be greater or less than usual – severe financial panic, expectations that prices would rise sharply, a special income bonus, an unusually appealing fashion. If this is true of shoes, it would virtually have to be true of other commodities and, indeed, in the case of price expectations in 1933, there was a lively bit of evidence suggesting that it is.

On Further Study

After so much toil and trouble these statements seem a disappointing harvest. In a word, we found that, though there was some evidence to suggest that quite a few factors influence consumer decisions to buy footwear, the actual course of shoe buying, during 1929-1941, can be quite well "explained" by simply taking account of consumer income and the downward trend. This means that our search for "strong" factors as we defined them at the outset has suffered at least partial defeat.

On the basis of logic and preliminary evidence we have converted the general hypothesis that in our culture anything can influence what people buy to a more specific one: The course of aggregate shoe buying over time might be materially influenced by the course of consumer income, income distribution as between rich and poor and as between town and country, changes in population and age distribution, what the industry offers and style dictates, whether incomes are rising or falling, whether they are expected to rise or fall or be subject to unusual uncertainty, the level of shoe prices relative to the price of other things that consumers buy, whether abrupt and extreme changes in price are expected, and the size of shoe stocks that consumers already have. Most of these factors

have some evidence to support their inclusion. For other commodities the list might be altered; for example, for durable goods or saving we might wish to consider the inclusion of changes in wealth, in availability of installment credit, in marriage rates, and in new homes; for other commodities, alterations of other sorts might be indicated.

When, however, it came to testing the hypothesis in a multivariate analysis of time series, results were most inconclusive on many counts. For this, any or all of three reasons might have been responsible: (1) the factors were actually not important governors of buying; (2) the influences could not be detached from their correlation with income or time; (3) they were not subject to enough change between 1929 and 1941, the period analyzed, materially to influence the course of aggregate consumer shoe buying.

Which of these three explanations applies is of course of considerable analytic importance. Insofar as the first is the major explanation – the intrinsic impact on buying is not strong – we might say that the search for factors that cause instability in the income–shoe consumption relationship may cease. But I reject this conclusion on the evidence. On the one hand, information based on area surveys or other kinds of data suggests that some of the factors actually do seem to be important; on the other hand, analysis of time series shows significant divergence between our statistics of shoe sales and sales explained by income, time, and even price. These differences should not, I believe, be dismissed as divergence between our statistics on sales and actual shoe sales in the country. They require an explanation.

The difficulty in providing one is due, therefore, to reasons 2 and 3 – absorption of minor influences by the powerful variables (during these years income varied more than in all but the most exceptional peacetime periods) and the fact that change in the secondary factors was not very strong, or at least not strong relative to the great sweeps in income. We have not, in other words, learned more because it is exceedingly difficult to do so, especially for the period that could be analyzed, rather than because there is nothing to learn concerning matters about which at other times it might be exceedingly important to know. On the matter of how to learn more, the study has provided a few insights that had best be assembled.

To some degree it might be possible to make progress at a purely technical level. The use of monthly rather than annual data, in spite of the complications they raise at a theoretical level, do, I think, help to spell out inadequacies in measurement and afford opportunities to improve it. The minor fluctuations in shoe buying that are visible in the monthly data and not in annual ones are about as reliably depicted as the trend or major cycle patterns (see the studies described in the Appendix). More work with monthly or quarterly series – and I come in a moment to the sort of work that might be useful – does seem to hold some promise. Data available for such analysis are constantly increasing as the Department of Commerce statistics on sales of specified sorts of stores,

which became available by 1936, continue to relate monthly histories of longer and longer duration. Another possible line of attack, and this one we did not utilize, is to aim at an explanation of rates of change in sales rather than sales proper. This approach would soften some problems and toughen others.[5] It is possible, too, that an adequate understanding of the impact of group standards on buying (via stock-objectives or otherwise) might provide a rationale for separate explanation of the broad movements that last several years and the shorter variation around them. This approach might improve on the purely mechanical device of "explaining" first differences rather than sales proper.[6]

The second direction for further work is suggested by the need underscored by this study to depend on agreement among various sorts of diverse evidence rather than on the reliability of any one. Let us consider for a moment among what sorts of diversities the search for agreement may proceed. First, there is of course the diversity among sources of data – area surveys, psychological studies, time series. We have followed the plan of utilizing some of these several sources in this study.[7] Second, the differences in the relative importance of several factors as between different times may carry information about influences that activate buying. A study of postwar shoe buying, when in a few years enough time has elapsed to give a statistical basis for analysis, could be usefully compared to the results of this study. Similar comparison between prewar and postwar buying of other commodities would be extremely valuable. The fact that after the war income remained at a high level for so extended a period of time gives other variables a new opportunity to exhibit their influence, especially in monthly or quarterly data.

A third source of diversity that has formed a recurrent theme in this paper is the difference among commodities in the reaction of buying to the several influences that play upon it. We have tried to list the factors that might have had a substantial influence on shoe buying and to assemble the evidence as to whether they did or not. For a single commodity, evidence of the influence of

[5] It would probably lessen, though not, as we saw in Chart 9 and Table 8, eliminate intercorrelation of independent variables. Since some sort of smoothing of the data is necessary, it introduces unpleasant statistical problems; it ought, however, to subdue the first differences in the residuals for sales proper. The use of first differences has been advocated as a method of reducing autocorrelation in the error term. See D. Cochrane and G. H. Orcutt, "Application of Least Squares Regression to Relationships Containing Auto-correlated Error Terms," *Journal of the American Statistical Association*, March 1949, pp. 32-61. They have also been used simply as a method of improving the estimates (see unpublished work by Ashley Wright, at Standard Oil of New Jersey, and Karl A. Fox, "Factors Affecting Farm Income, Farm Prices, and Food Consumption," *Agricultural Economics Research* [July, 1951], pp. 65-82).

Were the computations to be converted so that first differences in shoe sales, rather than sales proper, were the dependent variable, one would not necessarily transpose all variables in the same way. For example, first differences in the payroll-income ratio were selected to avoid correlation with income proper, not because the rate of change seemed the most desirable measure; therefore, the first difference might be retained rather than replaced by second differences.

[6] See note 10, pp. 36-37.

[7] Unfortunately, I have not been able to use psychological data, though much of relevance must be available in the literature. I have no doubt, however, that sharpened questions by economists would produce more specifically designed experiments by psychologists concerning reactions or preferences of individuals.

the minor variables is at best insecure.[8] But if the influence of that variable can be studied for each of several commodity groups, a well differentiated hypothesis can be formulated and tested. For some factors, such as expectations or income distribution, the direction of the influence that each factor would exert on the buying of most sorts of goods would presumably be the same, though the extent of the influence would be expected to differ in specifiable ways among the various classes of commodities. For other factors, such as income change, the sign as well as the extent of the impact would be likely to differ as between small routine expenditures and the large exceptional ones. For still other factors, of which consumer stock is an illustration, the time pattern of the variable itself must differ among commodities in accordance with their usual life and past history of sales. Studies of each factor in these diverse contexts would augment and, more important, buttress knowledge as the work proceeded. It would give a firmer understanding of factors influencing consumption as a whole as well as its parts; it would add materially to the understanding of saving.

A third approach suggested by this study is the pursuit of qualitative rather than quantitative knowledge – knowledge as to whether an influence is more likely to increase than to decrease buying and whether it will do so more under some circumstances than others. The troublesome problems that we have encountered at every turn – problems in constructing and selecting appropriate models, in disentangling variables from one another – have not only obvious negative implications but also positive ones. Quantitative statement, these things indicate, is typically difficult and hazardous. Qualitative insights, on the other hand, are far more accessible. Several sources of information may well agree as to the direction in which a given factor is likely to influence buying even though the extent of the influence is broadly uncertain. Furthermore, if we were not so determined to ascertain extent, we could learn far more surely about direction. I have in mind the unexploited possibility of small area surveys in which all but a limited number of economic variables have been eliminated by selective sampling. Time series, too, bear information as to the direction of influences the impact of which they are incapable of measuring at all satisfactorily. Even in this study of a single commodity we saw how change accompanying the war must cause shoe buying to depart from its previous patterns, how expectations about abrupt price change or bonus income cause spurts with subsequent valleys, how minor fluctuations in buying may well tend to be underestimated because of failure to measure fully the influence of secondary variables such as consumer stocks, income distribution, expectations, and shifts in income among various segments of the population. It is possible and desirable to take account of the direction in which these and other factors might cause buying to diverge from, say, a previous line of regression even though the extent of the divergence cannot be predicted, except perhaps as a vague order of mag-

[8] Note that our statistical measures of reliability are, because of the questionable applicability of the theory to the data, themselves quite unreliable for most time series.

nitude. Study of several commodities, along the lines indicated in the previous paragraph, makes it possible to simplify methods of study at the same time that findings are made more secure. An example of the use of a very simple technique covering a short period of time was given above (p. 63) in connection with the possible influence of expectations about prices in 1933 and 1934 on sales of seven departments of department stores. This crude analysis is subject to all sorts of refinement and extension, now that monthly data on sales of various sorts of stores have been available for a sizable stretch of years.

Were more and surer qualitative knowledge available it might help to answer critical questions in business cycle theory, such as whether tendencies toward retardation in buying may be present prior to retardation or decline in income payments. It would also provide a basis for judging how closely buying is, at certain times, likely to conform to typical relationships with major determinants of consumer purchasing. A firm grasp of the direction in which the many lesser determinants propel buying gives balance, or the necessary restraint, in the use to which more formal consumption functions are put. It makes their failures to predict under certain circumstances quite as reasonable as their successes.