PART II

Demand and Supply

Chapter 4

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Demand Functions and Prospects

THE QUESTIONS

THE primary question at issue for this conference can be posited simply: What will be the on-farm demand for major classes of farm products in each production period over the next 20 years? This simple question cannot really be answered — simply or otherwise. Ideally, net price-quantity functions together with output, factor price, and relevant general-economy relations could indicate magnitudes of alternative net returns streams and thus help to guide output adjustments. Commodity classes and markets should be defined to yield fairly low cross-demand and high cross-input relations to facilitate implementation of policy recommendations. All interrelated functions should be projected from a simultaneous system in which dynamic changes in variables and functional forms are explicitly introduced. Variables should include no processing or service components irrelevant to farm revenue. The system should reflect the impact of changes in market structure upon farm returns. Finally, possibilities for, and effects of, demand manipulation should be indicated.

METHODOLOGY

In general, available demand projections do not meet these specifications. Estimates of "needs" or requirements cannot easily be translated into unequivocal on-farm net price-quantity functions suitable for guiding input allocation.[1] Possible mutuality, temporal interrelations, and market-structure constraints are not always considered. Systems do not generally indicate means for controlling demand. However, these limitations are common to all projections and in those concerning food demand their adverse effects have usually been minimized.

[1]The following quotation illustrates the form projections commonly take: "The use of the term 'demand' in this paper is not synonymous with 'demand' in the usual economic sense, that is, the functional relationship between prices paid and quantities purchased. It is a broader term — widely used in outlook appraisals — that refers to total utilization of a commodity resulting from the combined influence of changes in price, changes in income, and changes in population." Cavin, James P., "Long-term outlook — trends in consumer demand," talk before 34th Agricultural Outlook Conference, Washington, D. C., Nov. 27, 1956, p. 3.

Nearly all economic projections involve essentially the same methods.[2] It is implicitly assumed that demand determinants and their interrelations are known from past experience; that reasonable limits can be assigned to their future dimensions and to both social variables and physical contexts as well; and that temporal changes in exogenous variables have been taken into account. Thus, projections indicate "acceptable" ranges of results consequent upon a disjunctive set of "reasonable" assumptions with respect to determining variables, their magnitudes, and interrelations. They are statements of this sort: If demand be generated within a specified system and if specified changes be introduced into the variables, their magnitudes, their functional interrelations, or the system itself, then future attributes of the demand may reasonably be expected to fall within indicated limits.

With a complete economic theory of change, relevant variables and relationships would be identified and others could be excluded. Without such theory, likely future patterns may be generated in many alternative ways, even if general agreement exists with respect to past observations over a period encompassing many significant changes in variables, their magnitudes, and relationships. Some demand projections, but not all, rest implicitly upon the orthodox static and disjunctive mechanism of individual demand theory which generates a simple system of determining variables and relations, imposes the constraint of maximization, and takes into account an undefined but complex battery of social and physical variables in the preference system. Most studies, however, depend explicitly on only one of the variables — income — specified by orthodox theory.

The preference system, income, and relative prices can define the static demand function of the individual. With fixed stocks of goods, a complete market system of exchange can be derived. If production and income-generating functions are introduced, a self-contained and consistent system for mutual determination of market inputs, outputs, costs, prices, incomes, and rates of purchase can be derived. Difficulties of aggregation are severe. A system based on classical theory is not statistically operational. Such demand constructs identify the relevant variables and impose broad limits upon likely functional forms and systems of determination. However, since neither the determinants of temporal changes nor their interrelationships are specified, there is no general agreement with respect to methods of projection. The effects attributed to preferences, population, and income changes appear in fact to be temporally interrelated in most demand projections. But, again, demand theory imposes no stringent limits on likely forms of such relationships. It seems impossible to derive operational hypotheses for projection from the limited propositions of orthodox demand theory.

Most published projections of farm demand seem to involve similar

[2] There is an excellent discussion of methodology in Kuznets, Simon, "Concepts and assumptions in long-term projections of national product," Long-Range Economic Projections, Studies in Income and Wealth, Princeton University Press, 1954, Vol. 16, pp. 9-42.

assumptions and operations.[3] Per-capita consumption rates are usually projected from income and price assumptions with shifts in preferences reflected in the income elasticities employed. A level of total population is then assumed and aggregate requirements defined. Thus, projections are usually net rates of purchase from which net price-quantity functions could presumably be adduced through adjustment for quantity-price elasticities. The explicit variables, then, are size of income and of population. Other attributes of both series which affect preferences may be implicitly introduced.

Generally, a global, all-commodity index is projected first. Base-period, per-capita takings at base-period prices are adjusted for projected incomes and then aggregated on the basis of population assumptions. Net export and nonfood demands are usually projected separately and often quite arbitrarily. Commodity projections are adduced separately and revised as necessary to achieve consistency with each other, with past relationships, and with the separately developed global projection. Thus, base-period consumption rates are assumed to change as fairly simple functions of population and income with constant base-period price ratios. Population projections are taken from demographers. Disposable income is projected from assumptions of number of workers employed, productivity per man-hour, and hours worked. Domestic utilization so estimated is then adjusted for net outside and nonfood uses.

A complete logical system cannot be derived from assumptions that: (1) net total consumption-total population elasticity is unity and (2) global projections so derived may then be adjusted through (a) assumed net consumption-income elasticities and (b) "judgment." No economy-wide or temporal interrelationships appear in the system. Assumption of constant price ratios or unexplained "adjustments" therein are disturbing. However, prices of many farm products and inputs are in fact tied together by close physical or economic interrelationships.[4] Base-period, net consumption-price coordinates are shifted rightward for population and for income, and then perhaps other "judgment" adjustments are made, particularly for relative price shifts. Such projections are not the ideal, but they may well indicate the general drift of future demands as well as more complex methods and as validly as production, cost, or supply projections.

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[3]For a comprehensive treatment of methodological aspects of farm-demand projections, see Daly, Rex F., "Some considerations in appraising the long-run prospects for agriculture," Long-Range Economic Projections, Studies in Income and Wealth, Vol. 16, pp. 131-89. Also, one of Cavin's studies, "Projections in agriculture," Long-Range Economic..., Vol. 16, pp. 107-30. Equilibrium supply-demand solutions for aggregate output and average price levels are developed under three sets of assumptions with respect to the general economic context in Cochrane, Willard W., and Lampe, Harlan C., "The nature of the race between food supplies and demand in the United States, 1951-75," Jour. Farm Econ., Vol. 35, No. 2, May, 1953, pp. 203-22.

[4]Schultz has argued that the relative price structure of major groups of farm foods tends to remain fairly stable in the long run. See Schultz, T. W., Economic Organization of Agriculture, McGraw-Hill Book Co., New York, 1953, p. 58.

THE DATA

The underlying logic calls for assumptions with respect to magnitudes of population, income, and those variables whose effect is determined by "judgment"; their preference-related attributes; and their net consumption elasticities at given price ratios. Data are also required to reduce retail-price-weighted-consumption projections of demand to farm levels. If market-structure and demand-manipulation changes are introduced, additional data are needed.

Population

Early projections of population were not realized because of higher-than-projected immigration, lower death rates, and sharply higher birth rates which may or may not represent a short-run bulge.[5] Structural changes in proportions of women married, age at marriage and first child, and perhaps in family size, appear to be basic factors in continuing the high birth rates of the 1940's. The Census Bureau published four projections of total population based respectively upon assumptions that (AA) 1954-55 rates would continue; and 1948-53 rates from 1955 bases would (A) continue through 1975; (B) continue to 1965 and decline thereafter to 1940 levels by 1975; and (C) decline continually, reaching 1940 rates in 1975 (Table 4.1).[6]

Table 4.1. Census Bureau Projections of Total United States Population (Including Armed Forces Overseas)*

Year	Series			
	AA	A	B	C
1960	179,358,000	177,840,000	177,840,000	176,452,000
1965	193,346,000	190,296,000	190,296,000	186,291,000
1970	209,380,000	204,620,000	202,984,000	196,370,000
1975	228,463,000	221,522,000	214,580,000	206,907,000

*Source: U. S. Bureau of the Census, Current Population Reports, Series P-25, No. 123, Oct. 20, 1955.

Assuming unit elasticity of food consumption and population, projections of "needs" or "requirements" can be generated as functions of population. There is, however, no "most reasonable" population series since no new pattern has yet definitely emerged. Population is the crucial series. The range in projected needs based upon divergent population assumptions is dangerously wide. This range is extended by

[5]Davis, Joseph S., "The population upsurge and the American economy, 1945-80," Jour. Polit. Econ., Vol. 61, No. 5, Oct., 1953, p. 371.

[6]For projections and discussion of various fertility assumptions, see U. S. Bureau of the Census, Current Population Reports. Series P-25, No. 123, Oct. 20, 1955; No. 78, Aug. 21, 1953. For earlier projections see No. 58, Apr. 17, 1952; No. 43, Aug. 10, 1950.

divergent assumptions of age, numbers of separate family units, and other population attributes related either to preference systems or to disposable income and usually introduced as a "judgment" adjustment.

However, with no change in real income or price relatives, domestic food needs could increase over 1955 levels by 12.7 to 17.0 percent in 1965 and by 25.2 to 38.3 percent in 1975 from population growth alone, assuming unit net elasticity of consumption with respect to population. The diversity of possible population assumptions leads to consequent diversity in projections of size of market, preference patterns, and income.

Disposable Income

Again, in the absence of any accepted theory of growth, many income projections are equally tenable. Income is usually related to population, number of employed workers, productivity, and hours worked, in a system which is operational and which is no weaker logically than more complex alternatives.

According to series AA, A, and B, United States population in 1975 may range from 215 to 228 million. Most entrants into the 1975 — or earlier — labor force are now living. Labor-force projections are, therefore, not greatly affected by changing birth rates. All three series project about 137 million people 14 years and older by 1965. Series A and B project about 159 million by 1975, and series AA about 161 million. Since 1945, from 57.2 to 58.8 percent of people 14 years and over have entered the labor force.[7] Percentage participation by particular age and sex groupings has been less stable. Expectations of wider schooling, early marriage, and high fertility lead to projected participation rates in 1965 and 1975 of slightly more than 57 percent.[8] This would mean about 78.3 million people in the labor force in 1965 and about 91.5 million in 1975 — an increase of about one-third over 1955. Most projections assume a decline in male participation to about two-thirds of the labor force, increased participation of women aged 35 to 64 years, and a lower percentage but a larger number of persons under 20 years in the labor force. Preference systems as well as incomes will vary with alternative labor-force assumptions. Despite the variety of assumptions, this is the most stable series in the system.

Productivity is defined in most analyses as real gross national product per man-hour of labor. More satisfying definitions usually cannot be quantified effectively.[9] Labor represents total factor input. Identity,

[7]U.S. Bureau of the Census, Current Population Reports. Series P-50, No. 61, Dec., 1955, Table 1.

[8]U.S. Bureau of the Census, Current Population Reports. Series P-50, No. 69, Oct., 1956, Table 3. Separate age-sex group participation rates were obtained from this table and applied to population series AA, A, and B to obtain estimates of labor force.

[9]For a discussion of this point, see Kendrick, John W., "National Productivity and Its Long-Term Projection," Long-Range Economic Projections, Studies in Income and Wealth, Princeton University Press, 1954, Vol. 16, pp. 67-104.

magnitude, and combinations of all factor inputs are subsumed in the ratio. Estimates of average annual rate of increase in productivity have generally ranged from 2.1 to 2.5 percent. An average annual increase of 2.5 percent is generally projected.[10] With low-income elasticities, varying assumptions here yield relatively minor differences in projected demand.

Projected declines in average hours of work per week vary from 5 to 15 percent below 1955 levels, centering about a decline of some 5 percent by 1965 and 12 percent by 1975. Decrease in hours worked may be partly offset by increases in labor force participation.

With additional assumptions of an unemployment rate of 4.5 percent, and with no war, depression, or other major disaster, gross national product is usually projected by the relationship:

$$P_1 = P_0 \left[E \times \frac{H}{E} \times \frac{P}{H} \right],$$

where P_1 and P_0 are the projected and base period indices, respectively, of GNP, E_1 is the projected index of number of workers employed, $\frac{H}{E}$ is the projected index of average man-hours per worker, and $\frac{P}{H}$ is the projected index of average productivity per man-hour. In each case the base period index equals 100. From a 1955 base, the 1965 GNP would be up about 34 percent and for 1975 about 75 percent. It is generally assumed that total disposable income will be about 71 percent of GNP in 1965 and about 73 percent in 1975. The new postwar income distribution patterns have been remarkably stable, and these patterns are, therefore, extended to 1975.[11]

Other Variables

Base-period price relatives are required even for point projections of "needs" or "requirements." Price projections are also necessary to adjust individual commodity projections or to develop net consumption-price functions. "Judgment" adjustments usually imply assumed changes in preference structures, with specific variables sometimes used as surrogates. If changing market structure and demand promotion are related to on-farm demand, carrier variables must also be identified.

THE BASIC RELATIONSHIPS

Projection of base-period consumption-price coordinates requires assumption of net elasticities of consumption with respect to population

[10]This is the assumption employed by the U. S. President's Materials Policy Commission. See U. S. President's Materials Policy Commission, Resources for Freedom, 1952, Vol. 1, p. 7.

[11]U. S. Office of Business Economics, Survey of Current Business, Mar., 1955, p. 18.

and to income. A zero net consumption-price elasticity for total food is assumed in most studies. Other magnitudes are assigned in some cases when projecting consumption rates or deriving net consumption-price functions for particular commodity classes.

Observed consumption-population elasticity has approximated the assumed magnitude of unity. The effects of changing population characteristics upon individual commodity classes appear to have been offsetting. By 1965 the total population will increase about 15 percent and the 10 to 19 age group about 48 percent. This should increase average per-capita demand for milk, citrus juices, and cotton. Infants and children consume only one-half the calories required by an adult, but caloric intake of teen-agers is about 25 percent above adult levels. Thus, changes in age distribution may raise per-capita caloric consumption 3 to 5 percent by 1975 despite the increase in older age groups.

Regional differences in population patterns and, therefore, in demands are closely related to the income variable.[12] Moreover, diets appear to be increasingly homogeneous. Changing occupational — and perhaps other — population attributes may affect regional, commodity, or even total demand.

The net retail expenditures-income elasticity is about +0.4 and about +0.7 for the service components. Net on-farm value-income elasticity averages about +0.15 with a wide variation among commodities. Net on-farm tonnage-income elasticity is near zero. The major effects of rising per-capita real income consist mainly of a minor shift to higher cost foods and a great increase in service components. Income elasticities appear to be higher than the average of all farm products for beef, chicken, most leafy, green, and yellow vegetables, and citrus fruits; about average for pork, eggs, and most dairy products; and less than zero for wheat, flour, dry beans, peas, and sugar.[13]

Net consumption-price elasticity is usually either not explicitly considered in total consumption projections or, if introduced, is generally set near zero. In projecting individual commodity requirements, net price elasticities must be considered only if projections are "adjusted" or if net consumption-price functions are derived. The existence of a stable relative price structure together with low and declining on-farm price elasticities probably mitigate the effects of omitting this relationship. The assumption of constant price relatives is usually relaxed for livestock products on the grounds that "requirements" could not be produced at such ratios. At least implicitly, output for these products is taken to be determined simultaneously with "demand" but in an unspecified system.

American tastes have changed dramatically in association with

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[12] U. S. Department of Agriculture, "Food consumption of urban families in the United States." Agr. Inf. Bul. No. 132, Oct., 1954, p. 9.

[13] For a discussion of empirical findings, see Daly, "The long-run demand for farm products," Agr. Econ. Res., Vol. 8, No. 3, July, 1956, pp. 73-91; Kuznets, George, "Measurement of market demand with particular reference to consumer demand for food," Jour. Farm Econ., Vol. 35, No. 5, Dec., 1953, pp. 878-95; and Schultz, *op. cit.*, pp. 44-82.

changes in population, income, labor-force constituency, dietary recommendations, processing and marketing technologies, market structure, perhaps promotion, and — almost surely — other factors. Thus far there has been no effective quantitative expression of the preference structure. Demands have shifted from carbohydrates and may be shifting now from certain animal fats.[14] Technological changes may affect both the form of products at retail and on-farm demands. Changing market structure may already have related requirements for type, uniformity, minimum quantity, terms of sale, and methods of distribution to farm returns. Promotion might conceivably have some net effect on consumption but its effects are, thus far, not measurable even for specific products. The relationships among these possible determinants of preference are largely nonquantified and perhaps largely nonquantifiable.

OTHER DEMANDS

The two-variable plus "other factors" projection mechanism is not usually replicated for nonfood items, which comprise more than one-third of the value of farm production.[15] Three-fourths of nonfood output is used as farm inputs — mainly feed. Consequently, demand projections for meats and feed-livestock conversion ratios must be major variables in the nonfood projection system, but few explicit references are made to them. Changes in particular demands are usually projected with fibers dependent on income and technology; tobacco dependent in part on medical research findings; and fats and oils dependent mainly on synthetic detergents, paints, and varnishes.

Foreign takings of major exported commodities such as wheat and flour, cotton, tobacco, and oils must be projected on quite arbitrary assumptions. Higher world population and per-capita incomes may reasonably be projected, but assumptions with respect to development and trade policies, exchange balances, and foreign aid are of a different order. Most studies project 1975 exports at levels somewhat below the 1955-56 volume without full explanation of the generating system.

PROJECTED DEMAND PATTERNS

The U. S. Department of Agriculture projections prepared by Dr. Daly generate increases between 1955 and 1975 of about 90 percent in GNP and 50 percent in average per-capita real income. As supplements, projections are also based on: population levels AA, A, and B; an

[14] U. S. Agricultural Marketing Service, The national food situation, Nov. 7, 1955 (outlook issue, NFS-74, 1956), p. 25. Also, Sebrell, W. H., Jr., "Nutrition — past and future," Proc. Nat. Food and Nutr. Inst., Agriculture Handbook No. 56, July, 1953, pp. 3-12.

[15] The U. S. Department of Agriculture concept of a "total flow of goods produced by agriculture" is used to define farm production. See U. S. Department of Agriculture, "Measuring the supply and utilization of farm commodities," Agriculture Handbook No. 91, Nov., 1955, pp. 16 and 83.

unemployment rate of 4.5 percent; an annual increase of 2.5 percent in output per man-hour; and a decrease of 5 percent in average hours per week by 1965 and of 12 percent by 1975. For all projections an average on-farm consumption-income elasticity of +0.2 is assumed.

Projections of demand determinants suggested by Dr. Daly imply a 1975 per-capita food consumption of 110 percent and aggregate consumption of 140 percent of 1955 levels. The three other projections also indicate that total demand may be expected to rise about 20 percent by 1965 and between 40 and 50 percent by 1975. Population change is the main determinant with income change a less important determinant. Within the limits noted, these shifts in "needs" may be taken as measures of change in aggregate on-farm demand. These projections are presented in Table 4.2. The total nonfood demand, projected to 1975 by aggregating commodity class projections, is expected to increase between 40 and 45 percent above 1955 levels. Export demand is expected to fall slightly below 1955-56 levels.

Dr. Daly's 1975 projections of per-capita and total utilization indices for commodity classes are presented in the two columns marked "I" in Table 4.3. Per-capita and aggregate use are also projected on the basis of a 1975 population of 221.5 million and a GNP of 680 billion dollars, using Dr. Daly's basic methods insofar as possible. These are shown in the columns marked "II." Only a few items are threatened with shrinkage in aggregate requirements. Relative changes in "requirements" do not necessarily indicate relative profitability in production with either set of assumptions. The smallest increases are projected for nonfood fats and oils, fruits other than citrus, sugar, potatoes, and wheat. Percentage increases in "requirements" for dairy products, eggs, and vegetables other than tomatoes and the leafy, green, or yellow items, are about the same as for the total food market. "Requirements" for meats and meat products, and thus for feeds and forage crops, will apparently increase at a faster than average rate.

These are all well-established trends. However, changes in market structure may shift on-farm demands sharply in terms of type of product and in terms and methods of sale. Expansion of prefabrication and convenience processing could also introduce new variables into the farm-demand function. And if the commodity projections are used as guides to production, price elasticities must also be projected.

IMPLICATIONS OF FINDINGS

There is no clearly articulated theory of economic change from which workable hypotheses can be derived to guide selection of data and functional forms. Thus, there are many equally tenable methods of projection. Most demand projections measure net price-quantity relationships in a base period and project them within a simple system. Measurement techniques are rudimentary largely because the concepts themselves are crudely defined and are not couched in a complete theoretical structure.

Table 4.2. Projected 1965 and 1975 Aggregate Domestic Food Consumption Under Several Alternative Assumptions

	1955	1965		1975			
		AA	A and B	AA	A	B	Daly[a]
Gross national product (billion dollars)[b]	390.9	524.2	524.2	684.5	679.8	679.8	725-750
Population (millions)	165.3	193.3	190.3	228.5	221.5	214.6	210.0
Disposable income (billion dollars)	270.6	372.2	372.2	499.7	496.3	496.3	519.8
Disposable income per capita (dollars)	1,637.0	1,926.0	1,956.0	2,187.0	2,241.0	2,313.0	2,475.0
Labor force (millions)	68.9	78.3	78.3	92.0	91.4	91.4	90-95
Labor force employed (millions)	66.2	74.8	74.8	87.9	87.3	87.3	88.3
Computation of GNP							
Index of number employed	100.0	112.9	112.9	132.7	131.8	131.8	133.4
Index of productivity	100.0	125.0	125.0	150.0	150.0	150.0	140.0
Index of hours expended per worker	100.0	95.0	95.0	88.0	88.0	88.0	
Product of indices	100.0	134.1	134.1	175.1	173.9	173.9	186.8
Computation of index of aggregate consumption							
Index of population	100.0	116.9	115.1	138.2	134.0	129.8	127.0
Index of per-capita food consumption	100.0	103.5	103.9	106.7	107.4	108.3	110.2
Index of aggregate consumption	100.0	121.0	119.6	147.5	143.9	140.6	140.0

[a] The assumptions used by Dr. Rex F. Daly are developed in: "Appraising longer run demand prospects for farm products," Increasing Understanding of Public Problems and Policies, 1956, Farm Foundation, pp. 49-66. Also, "The long-run demand for farm products," Agr. Econ. Res., Vol. 8, No. 3, July, 1956, pp. 73-91.

[b] Projections for population assumptions AA, A, and B are made on the basis of the 1955 price level by multiplying 1955 GNP by the product of the three indices: index of number employed, index of productivity, and index of hours expended per worker.

Table 4.3. Indices of Per-Capita and Total Utilization (Including Exports) of Major Agricultural Commodities — Two Projections for 1975*

Commodity group	1975 per-capita utilization		1975 total utilization	
	I	II	I	II
	1953 = 100			
Food use				
Meat				
Beef and veal	109	107	138	143
Pork (excluding lard)	119	114	152	154
Lamb and mutton	87	90	113	124
Total	113	109	143	146
Poultry products				
Chickens and turkeys	119	114	153	155
Eggs	108	106	140	145
Dairy products				
Total milk equivalent	106	104	134	140
Fats and oils: food	105	103	148	154
Fruit				
Citrus	136	127	176	173
Other	107	105	131	136
Vegetables				
Tomatoes	122	117	154	155
Leafy green and yellow	115	111	145	148
Other	112	109	138	142
Potatoes and sweet potatoes	85	89	106	117
Wheat	89	92	104	114
Sugar	97	97	126	134
Nonfood use				
Fats and oils: nonfood	97	98	131	139
Feed concentrates	--	--	142	145
Cotton	115	111	143	146
Tobacco	119	115	155	157

*Sources:

I—Projections by Dr. Rex Daly in: "Appraising longer run demand prospects for farm products," Increasing Understanding of Public Problems and Policies, 1956, Farm Foundation, pp. 49-66. Also, "The long-run demand for farm products," Agr. Econ. Res., Vol. 8, No. 3, July, 1956, pp. 73-91.

II—Dr. Daly's projections adjusted by authors for a population of 221.5 million and GNP of 680 billion dollars.

Demand Prospects

The assumptions upon which a 40 to 45 percent increase in total consumption is projected over the two decades ending in 1975 are not unreasonable. This is the relevant estimate for determining resources which need to be used in agriculture as a whole. With respect to optimum input allocations among particular products, all projections indicate essentially a continuation of trends well established in the last decade or more. Despite inherent and inescapable limitations of current predicting methods, the broad outlines of future demands may be sketched in more effectively through use of these than through blind guessing, to provide part of the necessary data in planning adjustments by commodities, seasons, or regions. Technical implications of the projected demand shifts involve appraisal of increasing crop yields versus addition of land; conversion of feeds into livestock products at levels implicit in the demand projections; and fertilization, supplemental irrigation, and other cost-increasing technological changes or shifts in input allocation dictated by relative net income prospects. Projections are dangerous. Food-demand projections involve two special dangers — the difficulty of deflating for services at retail and adjusting for changing market structure. Long-term planning must, therefore, be kept fluid.

Possibilities of Increasing Demand

One possible line of adjustment in trying to solve the agricultural problem is to manipulate demand. Conceptually, demand can be shifted by controlling preference structures through advertising, promotion, or education; by lowering cross-demand elasticities through product differentiation; and by manipulation of income distributions. Most proposals for manipulating demand for agricultural commodities involve promotion and differentiation, either to increase real expenditures for farm products as a whole or to shift relative expenditures among commodity lines or items.[16]

Thus far, net effects of various means to decrease substitution elasticities or to increase demand for agricultural commodities have not been measurable — not even for single products, and certainly not for multiple-product enterprises or for broad sectors of the industry. Long-run changes in tastes have had drastic effects on the demand for commodities and on enterprises. Some of them seem to be related to population and income patterns. But preference systems are not really defined quantitatively and, thus far, efforts to specify net effects on demands of variables thought to reflect changes in preferences have not been successful.

[16] For a discussion of possibilities of sales promotion and advertising, see Cochrane, W. W., "Advertising... fact or fancy?" Farm Policy Forum, Vol. 9, No. 1, Summer, 1956, pp. 28-32. Also, "Some additional views on demand and supply," pp. 94-106, in this book.

Experience indicates that demands shift toward livestock products as incomes rise. Thus, there is no logical reason to believe that total consumption could be affected any more favorably by advertising than by increased income; nor in all likelihood could advertising have any sustained effect upon any class of product to which demand does not normally drift as incomes rise. Efforts to manipulate food demand through advertising and other promotional methods cannot be expected to serve as a fully effective method of solving the farm problem and achieving future economic adjustments. If this is true, then the mechanism associated with achieving adjustment of farm production should be analyzed.