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Part V

Family Savings in Relation to Changes in the Level and Distribution of Income

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This paper summarizes one part of the analysis of savings data included in the saving and capital market study directed by R. W. Goldsmith under the sponsorship of the Investment Committee of the Life Insurance Association of America.

INVESTIGATIONS OF THE RELATION between family income and savings have in recent years increasingly been focused on variations in income as a possible explanation of the differences in the expenditures and savings of a given income group in different places at different times or in different phases of a business cycle. A study of family savings in various types of community indicated that the level and distribution of income accounts for part of the community differences in savings patterns at a given date.[1] Two studies, mainly of aggregate data, have produced convincing evidence that current savings are correlated with a change in income.[2] Intensive analysis of family savings in 1929, 1935, 1941, 1945, 1946, and 1947 led to the conclusion that income-savings ratios vary less in the higher income brackets, defined relative to average income, than in the intermediate and lower brackets.[3] The explanation lies, according to Mr. Kuznets, in the elasticity of consumption at the various levels of income and in the variation in the income of identical recipients from time to time along the range of incomes from year to year.

These investigations and others all implicitly postulate what may be called a 'normal form' for the relation between income, expenditures, and savings, and assume that deviations from it can be traced to fluctuations in the income of individuals and classes. This normal form in the expenditure-savings pattern would be characteristic of a period when the distribution of income among families, localities, and classes had not changed essentially for some time. Basic to the concept of essential stability in the consumption and savings functions relating aggregate consumption and savings to aggregate income, it can be described as a central position in a series that is perhaps continuously oscillating as economic developments affect the individual community.

[1] Dorothy S. Brady and Rose D. Friedman, 'Savings and the Income Distribution', *Studies in Income and Wealth, Volume Ten.*

[2] Franco Modigliani, 'Fluctuations in the Saving-Income Ratio', *ibid., Volume Eleven,* and James S. Duesenberry, 'Income-Consumption Relation and Their Implications', *Essays in Honor of Alvin H. Hansen, Income, Employment and Public Policy* (Norton, 1948).

[3] Simon Kuznets, *Shares of Upper Income Groups in Income and Savings* (NBER, 1952).

The exact description of the normal form depends upon the nature of the empirical data that are available for confirming its existence as a relation toward which the changing patterns of expenditures and savings seem to be directed. Consequently, it must be in terms of the variables that have been measured in the numerous surveys of family living expenditures in different communities and at different dates.

A Certain Operating Propositions

Thus for empirical verification the characteristics of a normal savings pattern, if it exists, and of deviations from it must be described in a series of propositions that interpret the statistical observations in terms of the hypothesis. Since the statistical observations do not include continuous series on income in individual communities for several years, these propositions must relate to the time of the various surveys.[4] Consequently, a first and important proposition cannot, for absence of data, be subjected to formal statistical demonstration, namely:

a) Communities vary considerably in the magnitude of changes in the average income level during a given period.

That is, income in the communities surveyed in a given year varies substantially around the average change from preceding levels as measured by the national totals. Proposition (a) assumes that when incomes in general are rising, those in some communities rise much before those in others and, conversely, incomes in some communities decline perhaps considerably

[4] Sources used in the study:

Department of Labor, Sixth Annual Report of the Commissioner of Labor, 'Cost of Production: Iron, Steel, Coal' (1891); Seventh Annual Report of the Commissioner of Labor, 'Cost of Production, Textiles and Glass' (1892).

Department of Commerce and Labor, 18th Annual Report of the Commissioner of Labor, 'Cost of Living and the Retail Price of Food' (1903).

BLS *Bulletins: 357*, 'Cost of Living in the United States' (1924); *637-41*, 'Money Disbursements of Wage-earners and Clerical Workers, 1934-36'; *642-7*, 'Family Expenditure'; *956*, 'Family Income and Expenditures in 1945'; 'Survey of Prices Paid by Families in 1946' (mimeograph, LS49-3497); 'Family Income and Expenditure in 1947' (Serial No. R. 1956), reprint from *Monthly Labor Review*, April 1949; 'Consumer Spending: Denver, Detroit, Houston, 1948' (Serial No. R. 1984), reprint from *Monthly Labor Review*, December 1949; 'Family Income and Expenditures: Los Alamos, 1948' (Serial No. R. 1970), reprint from *Monthly Labor Review*, September 1949.

Department of Agriculture, *Miscellaneous Publication 396*, 'Family Income and Expenditure, Part II, Family Expenditures, 1935-36'.

University of Michigan, Survey Research Center, Special Tabulation, 'Savings of Nonfarm Families by Income Level, 1947'.

before a general depression. Thus in any one year, individual communities are at different stages along the trend or cycle of changing income and it may be assumed that incomes in some communities do not differ substantially from levels maintained for some years.

A second proposition, namely:

b) Expenditures by a given income bracket are positively correlated and savings are negatively correlated with the general level of community income in the normal pattern of expenditures and savings in relation to income,

may be submitted to statistical verification in several ways. The correlation of the expenditure and savings patterns with the general level of community income reflects variations in the price level, in the importance of home production for home consumption, and in the standard of living. For present purposes the community income level is taken as representing the complex of all three elements affecting consumption, and an attempt to isolate their effects will be introduced in Section H. The second proposition thus states the variables: family income bracket, average expenditures and savings at that bracket, and the average community income in current dollars. Examination of the correlation between the savings patterns and community income, simply stated in current values, has two more prerequisites for the purposes of this investigation:

c) When incomes have increased substantially, the expenditure patterns of communities with the same average income in a given year are predominantly below, and the savings patterns predominantly above, the normal form for that level of community income.

d) Conversely, when incomes have decreased substantially, the expenditure patterns of communities with the same average income in a given year are predominantly above, and the savings patterns predominantly below, the normal form for that level of community income.

These propositions define an analytic procedure for identifying the normal form, if it exists and is constant over time. In a year when average incomes have risen, communities with the highest expenditures and lowest savings for a given income bracket are assumed to be closest to the normal relation, while in a year when average incomes are well below former levels, communities with the lowest expenditures and highest savings for a given income bracket are assumed to be nearest the normal form. The observations made in 1917-19 illustrate the first situation; those made in 1934-36, the second. The statistical problem is to ascertain whether the recorded expenditures and savings for these different dates converge toward the common form specified in the analytic model, and if so, to determine the magnitude of the deviations at different phases of the cycle.

The relation of these propositions to the concept of income components, developed by Milton Friedman and Simon Kuznets, may be used to clarify their implications.[5] The normal form of the hypotheses as specified in proposition (b) makes expenditures and savings a function of family income and of the general income level of the community in that hypothetical 'stable' period. This formulation of the relation assumes that the combined effect of the 'permanent component' of individual income and the part of the 'transitory component' that does not depend on the trend or cycle of incomes in general causes the expenditure-savings pattern to be stable. The variations described in propositions (c) and (d) are thus to be interpreted as the influence of the part of the 'transitory component' that affects large groups at the same time. Clearly the assumption of a uniform influence of the first (individual) part of the 'transitory component' must be checked in investigating the data for communities with very different economic compositions.

B Statistical Procedures

The statistical procedures are likewise limited by the character of the observational data. The great variations in the methodology and population coverage among the surveys of family income and expenditures for the different dates since 1888 impose the need for some step by step procedure that will afford a continuing check on the effect of various assumptions essential to combining data from the various surveys.

The two large bodies of data best adapted for this exploration are for 1917-19 and 1934-36 because the first investigation published data on expenditures and savings by income bracket for 92 cities and the second for 66 (when negro communities are counted as separate cities). Although both investigations were confined to wage earners and low salaried families the relatively large community samples make the data the core of the analysis.

The other large body of data, for 1935-36, has some serious handicaps for this particular exploration in that expenditure-savings patterns were published for groups of communities that, more often than not, included cities or towns with quite different income distributions. Thus, although the population coverage was broad and the income range wide, the data have to be used as secondary material in the general analysis.

The tabulations for 1888-90 and 1901 are only by states; hence com-

[5] *Income from Independent Professional Practice* (NBER, 1945), p. 325; see Part VI, Section D3.

bining communities presents the same kind of difficulty as the combinations in the Consumer Purchases Study, 1935-36.

Data for 1945-48 are available for 15 communities. The concepts and population coverage in these postwar studies are best adapted for this analysis, but the cities for any one year or for the whole period are too few for a satisfactory statistical analysis of the type projected.

Because of these limitations, which are further described below, the data for 1917-19 and 1934-36 were analyzed in terms of the four propositions outlined, supplemented when necessary and possible by the data for 1935-36. The results were then simply compared with the data for 1888-90, 1901, and 1945-48. A procedure that utilizes all the data in one analytical process must await much more in the way of adjustments for concept and coverage than has been possible here.

One further consideration controlling the analytical approach arises from the desirability of utilizing the data from the sundry 'national' samples which provide only the savings pattern by income bracket for all communities combined and do not give details for separate communities. This means that the results of the analysis for individual communities must be in a form to compare with the national sample tabulations.

C Savings and Community Income, 1917-19 and 1934-36

Propositions (b), (c), and (d) imply a classification of communities, in this case cities, by average family income. Since the surveys for 1917-19 and 1934-36 covered only specific groups of wage earners and salaried families, we must estimate the average income to be used in classifying the cities. Comparison of the relation between the average income of the wage earner and salaried groups of the types surveyed in these two studies and that of all types of family in 1935-36 in 30 cities indicates that the average income of nonrelief wage earner and low salaried groups can be taken as a rough measure of the community income level, although the differences among communities are somewhat less for wage earners than for the total population. This means that low income cities are classified above, and high income cities below, their proper position when the classification is based on the incomes of wage earner and low salaried groups instead of the incomes of the total population.

For specific levels of community income so estimated, the range of expenditures and savings among cities within family income brackets for the two dates shows that the highest savings pattern for 1934-36 and the lowest savings pattern for 1917-19 tend to converge. An average of the 1934-36 high and the 1917-19 low could be used to describe the normal position for

each period (Table 1). This average could then be projected to earlier and later dates.[6]

The negative correlation of savings with community income, postulated in proposition (b), is evident in Table 1 and more conspicuous in Table 2. The data as summarized thus appear to confirm propositions (b), (c), and (d). The highest savings pattern for a given level of community income in 1934-36 and the lowest savings pattern for communities with corresponding incomes in 1917-19 tend to be identical, and the common savings curve declines at all levels of family income as the general level of community income rises.

The point of zero savings, the break-even point, is usually below the (community) mean income, but never as much as 50 percent (Tables 1 and 2).[7] This property of the savings curve must be considered in deciding on how to express analytically a closer relation as a basis for further comparisons and inferences.

To simplify certain derivations, logarithmic lines were used to summarize statistically the relation of expenditures to family income, and the community average income and savings were expressed as the difference between income and expenditures. Thus if y represents expenditures, x family income, z community income, and savings s

$$\log y = a + b \log x + c \log z \tag{1}$$

$$s = x - y. \tag{2}$$

Since zero savings appear at some family income bracket below the community mean income, coefficients b and c in equation (1), if it is to reflect

[6] Expenditures and savings were standardized to an average family size of 3.5 persons.

Certain variations in concepts may have some effect on the comparisons. Income as defined for the 1917-19 study included the net value of home produced and home consumed food, whereas income as defined for the 1934-36 study covered only money receipts. Expenditures for the 1917-19 tables included principal payments on mortgages on owned homes, an item that is included in savings in the 1934-36 tables. Savings were a residual in the 1917-19 study and directly estimated by the respondent in 1934-36. These differences in procedure may be of some significance because of the use of a 'balancing' criterion for accepting schedules for tabulation in 1934-36.

The range among communities was used throughout the tables as a substitute for the complete distributions as the best device for tracing the relation of the 'scatters' at the different dates.

The other boundaries, the highest savings in 1917-19 and the lowest in 1934-36, appear to be roughly parallel in *percentage terms* with the high and low.

[7] The break-even point is in many cases very difficult to locate by simple interpolation because the observed savings fluctuate about zero over a considerable range of income. These observations are based on inspection of the graphs by placing the point of zero savings in its probable position on a smooth curve.

Table 1

Savings and Community Income, 1917-19 and 1934-36

FAMILY INCOME CLASS	RANGE IN AVERAGE SAVINGS AMONG CITIES IN *1917-1919*		*1934-1936*		*1917-1919*		*1934-1936*	
	Income $1,300-1,350				Income $1,400-1,450			
	High	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*
Under $900	$91	$18	−$11	−$137	$81	−$16	−$19	−$256
900-1,200	138	47	41	−38	91	50	4	−78
1,200-1,500	247	140	129	9	166	105	12	−102
1,500-1,800	411	211	165	30	248	169	127	−11
1,800-2,100	394	220	152	69	413	228	284	−6
2,100-2,500*	700	349	426	273	512	403	248	−28
No. of cities	6		6		14		9	
	Income $1,450-1,500				Income $1,500-1,550			
	High	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*
Under $900	$77	$28	−$28	−$53	$81	−$30	−$42	−$165
900-1,200	93	4	−16	−63	102	−23	−8	−163
1,200-1,500	201	108	47	−44	156	85	32	−74
1,500-1,800	292	199	51	−4	301	179	86	−41
1,800-2,100	457	271	113	30	477	137	296	18
2,100-2,500*	567	307	342	44	681	307	253	24
2,500 & over*	781	589			648	496	311	69
No. of cities	9		4		16		10	
	Income $1,550-1,600				Income $1,600-1,650			
	High	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*
Under $900	$30	−$111	−$23	−$198	$36	−$58	−$17	−$159
900-1,200	76	−12	−25	−83	147	44	−13	−109
1,200-1,500	127	58	17	−58	189	94	38	−110
1,500-1,800	230	74	67	−16	346	170	110	6
1,800-2,100	357	249	55	−44	440	226	136	18
2,100-2,500*	605	337	199	37	601	456	269	116
2,500 & over*	913	530	403	44	739	500	389	109
No. of cities	10		9		10		5	

Sources: BLS *Bulletins 357* and *637-41*. The data throughout all classes represent families averaging 3.5 persons.

* The 1934-36 survey used $2,400 instead of $2,500 for this class limit.

this tendency, must be such that their sum is less than or equal to 1. A regression, calculated from the observations for 1917-19 and 1934-36 corresponding to the largest samples, yielded 0.83 for b and 0.18 for c. Rounding these values to one significant figure provides magnitudes that satisfy the requirement and are simple enough for the descriptive relation

Table 2: Savings and Community Income, 1888-1948

AVERAGE COMMUNITY INCOME	RANGE IN AVERAGE SAVINGS AMONG COMMUNITIES IN 1888-1901 Low	1888-1901 High	1934-1936 Low	1934-1936 High	1945-1948 Low	1945-1948 High
	FAMILIES WITH $550 INCOME					
$350			—$199*	$147*		
475	$29	$61				
585	57	154				
595	—1	58				
650	—37	88				
690	73	140	—313*	65*		
745	23	64				
770	—26	37	—75*	11*		
835	—15	66				
925			—1	7		
	FAMILIES WITH $750 INCOME					
$350			—$53*	$257*		
475	$114	$133				
585	51	219				
595	53	211				
650	—33	175				
690	111	251	—150*	35*		
745	84	130				
770	61	103	34*	96*		
800			—16	22		
835	59	143				
870			67*	109*		
925			—33	13		
1,000			6	61		
1,110			—29	40		
3,050					—$612	—$325

AVERAGE COMMUNITY INCOME	RANGE IN AVERAGE SAVINGS AMONG COMMUNITIES IN 1888-1901 Low	1888-1901 High	1934-1936 Low	1934-1936 High	1917-1919 Low	1917-1919 High	1945-1948 Low	1945-1948 High
	FAMILIES WITH $1,050 INCOME							
$325			$167*	$260*				
475	$219	$285						
585	272	278						
645	59	384						
650	11	253						
690	192	357	—153*	199*				
745	169	295						
770	213	372	66*	203*				
800			—5	96				
835	95	345						
870			236*	302*				
925			34	73				
1,000			6	61				
1,110			—29	40				
1,225			—79	34	$94	$119		
1,325			—40	45	41	130		
1,375					54	98		
1,425			—87	4	38	96		
1,475			—62	—14	8	91		
1,525			—163	—9	—24	100		
1,575			—105	—25	—47	72		
1,625			—111	—13	17	124		
1,750			—187	—104	—58	92		
1,950					—20	143		
2,400							—$10	$52
3,050							—514	—268
3,500							—703	—236
4,475							—989	—962

Table 2 *(cont.)*

AVERAGE COMMUNITY INCOME	RANGE IN AVERAGE SAVINGS AMONG COMMUNITIES IN 1888-1901 Low	1888-1901 High	1934-1936 Low	1934-1936 High	1917-1919 Low	1917-1919 High	1945-1948 Low	1945-1948 High
			FAMILIES WITH $1,350 INCOME					
$325			$253*	$330*				
650	$146	$495						
690	402	437	259*	360*				
745	343	460						
770	344	430	311*	398*				
800			101	213				
835	204	470						
880			457*	519*				
925			60	117				
975			53	142				
1,110			32	99				
1,225			−7	99	$144	$200		
1,325			10	133	133	250		
1,375					117	232		
1,425			−102	25	109	171		
1,475			−43	47	106	210		
1,525			−71	35	86	174		
1,575			−59	−18	54	128		
1,625			−110	38	89	199		
1,675					120	151		
1,750			−119	−40	−7	218		
1,950					−20	143		
2,400							$20	$62
3,050							−416	−211
3,500							−701	−172
4,475							−978	−806

AVERAGE COMMUNITY INCOME	RANGE IN AVERAGE SAVINGS AMONG COMMUNITIES IN 1934-1936 Low	1934-1936 High	1917-1919 Low	1917-1919 High	1945-1948 Low	1945-1948 High
	FAMILIES WITH $2,500 INCOME					
$690	$984*	$1,357*				
770	1,062*	1,264*				
920	848*	1,344*				
1,300	146	376				
1,375			$346	$814		
1,425	52	345	338	650		
1,475	151	421	401	696		
1,525	63	308	369	657		
1,575	18	381	378	716		
1,625	37	305	465	696		
1,685	170	234	322	519		
1,725	78	238				
1,750			256	661		
1,860	3	89				
1,950			413	612		
2,400					$134	$177
3,050					−226	46
3,500					−463	−13
4,050					−302	−158
4,475					−490	−428

Table 2 *(concl.)*

AVERAGE COMMUNITY INCOME	RANGE IN AVERAGE SAVINGS AMONG COMMUNITIES IN 1935-1936		1945-1948	
	Low	*High*	*Low*	*High*
	FAMILIES WITH $3,500 INCOME			
$900	$1,494*	$2,310*		
1,300	506	796		
1,450	413	913		
1,575	292	696		
1,695	472	790		
1,860	90	417		
2,400			$272	$549
3,050			−395	452
3,500			−41	371
4,050			−220	−89
4,475			−675	−208
	FAMILIES WITH $5,500 INCOME			
$1,300	$915	$2,183		
1,450	1,001	1,853		
1,575	1,039	1,202		
1,695	1,086	1,762		
1,860	191	1,289		
3,050			$417	$1,408
3,500			486	920
4,050			−606	786
4,475			−238	442
5,600			−115	50

Sources listed in note 4. The figures are simple interpolations.
* Farm communities.

needed. The corresponding value of a is −0.0295. The relations for expenditures and savings

$$\log y = -0.0295 + 0.8 \log x + 0.2 \log z \qquad (3)$$
$$s = x - y$$

thus describe the normal function specified above for the range of incomes covered in the 1917-19 and 1934-36 surveys, that is, $800 to $3,000 family income.

To check the stability of the general magnitudes of these parameters for lower and higher ranges of family income the survey data from the Consumer Purchases Study for 1935-36 were utilized. On the assumption that most reports on expenditures and savings in the upper income brackets came from communities with the highest average incomes in the tabulating unit, the groups of communities were classified by the income level of those communities.[8] For the family income brackets above $2,500 the

[8] Thus the 'Rocky Mountain middle size cities', Butte, Montana, and Pueblo, Colorado, were classified by the average income in Butte, $1,592, which was considerably above the average income in Pueblo, $1,187.

constants in equation (1) fitted to the 1935-36 data so classified agree sufficiently well with those determined in (3) to warrant the assumption that it describes family income up to perhaps $6,000 reasonably well.

For lower income brackets as far down as $500 family income, data are available for negro communities in 1934-36. Again the correspondence of equation (3) with the data is satisfactory and serves as a check on the assumption that negro communities should be analyzed as separate cities.[9]

D Savings and Community Income before 1917 and after 1936

Before examining the implications of the normal form of the savings pattern and deviations from it, the questions raised by investigating its projections to earlier and later dates may be introduced. When curve form (3) is extended for two central income brackets in 1888-90[10] it evidently comes close to or within the range of the observed averages; hence the normal relation between family income, family savings, and community income level seems to have been stable from 1888 to 1936 (Chart 1 and accompanying tabulation).

The observations for separate communities in 1945-48 are too few to constitute more than a preliminary check on the extension of the prewar relationships. However, they confirm the proposition that savings are inversely correlated with the community income level, though the 'slope' of the relation seems steeper than in the average relation (3) for 1917-19 and 1934-36. Whether this steeper slope can be ascribed significance must await more data. Comparisons of the projected prewar relation with the data from one of the national surveys suggest that these results for the small samples of individual cities might be ascribed to sampling variability. The fair correspondence suggests that the prewar relation between family income, family savings, and community income level still holds. The 1947 data, provided by the University of Michigan, Survey Research Center, from the 1948 Survey of Consumer Finances, are based on a different definition of the family unit than was used in the other surveys included in

[9] It should perhaps be stressed that the purpose of these calculations and comparisons is to determine the general order of magnitude of the relations under investigation in order to examine their implications. The formulation of the problem in a manner susceptible of precise methods of 'curve fitting' requires both many preliminary statistical tests and extensive adjustments of the data.

[10] The data for 1888-90 are more suitable for this comparison than those for 1901 which apply to families with children under 14 and thus may not be strictly comparable with the data for other periods.

AVERAGE FAMILY SAVINGS

Average Community Income	Projection of 1917-19 & 1934-36 Relations	Observed Average *Low*	*High*
	1888-1890		
	FAMILIES WITH $550 INCOME		
$475	$51	$29	$61
595	28	−1	58
650	19	−37	88
770	0	−26	37
	FAMILIES WITH $750 INCOME		
$475	$110	$114	$133
595	81	53	211
650	69	−33	175
770	46	61	103
	1945-1948		
	FAMILIES WITH $2,500 INCOME		
$2,400	$183	$134	$177
3,050	69	−226	46
3,500	2	−463	−13
4,050	−72	−302	−158
4,475	−125	−490	−428
	FAMILIES WITH $3,500 INCOME		
$2,400	$468	$272	$549
3,050	319	−395	452
3,500	230	−41	371
4,050	123	−220	−89
4,475	65	−675	−208
	FAMILIES WITH $5,500 INCOME		
$3,050	$933	$417	$1.408
3,500	805	486	920
4,050	666	−606	786
4,475	569	−238	442
5,600	343	−115	50

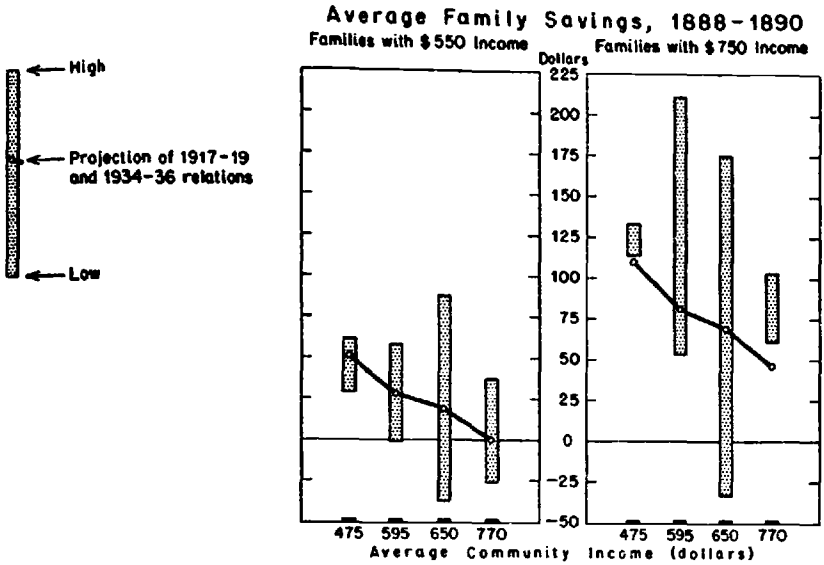
this analysis. This and other methodological differences could lead to greater divergence between the observations and the prewar relation (as measured) than appears in this comparison.

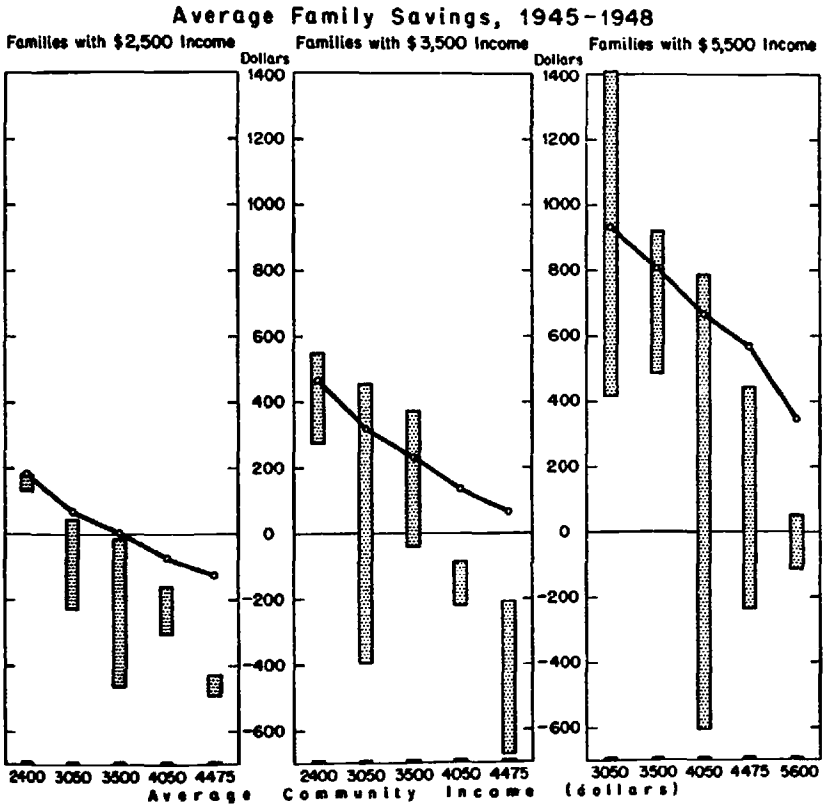
AVERAGE NONFARM FAMILY SAVINGS, 1947

Family Income Class	Estimated Average Income	Actual	Projection of 1917-19 & 1934-36 Relations
All classes	$3,676		
Under $1,000	715	−$291	−$192
1,000- 2,000	1,623	−135	−163
2,000- 3,000	2,538	−38	−12
3,000- 4,000	3,478	36	177
4,000- 5,000	4,433	177	414
5,000- 7,500	6,000	616	879
7,500-15,000	8,302	1,739	1,645
15,000 & over	20,000	6,699	6,511

Chart 1

Comparison of Observed with Projected Family Savings at Selected Community Income Levels, 1888-1890 and 1945-1948





The projection of the normal relation between family income, family savings, and community income level in 1917-19 and 1934-36 to earlier and later dates thus indicates that some such relation persists throughout. The refinement of the analytic form, which would involve extensive calculations if all available data were included, would be of limited usefulness until many questions of measurement and interpretation are answered: the influence of occupation and class of work on the form of the savings function; the relation of the average community income to the price level and standard of living; the relation between particular categories of consumption and savings; and differences in the composition of savings in different places and times.

E The Break-even Point and Community Income

According to equation (3) the break-even point appears in the normal savings pattern at a family income amounting to approximately seven-tenths of the average community income.[11] According to income size distributions it probably corresponds roughly to the median or modal income. Changes in the general level of income shift the break-even point to a lower or a higher relative position as incomes rise or fall. Thus, apparently a large fraction of the population saves only when the family income is above the median or the mode or substantially above levels of preceding years. This conclusion can be made more dramatic by excluding the relatively inelastic items of savings, insurance, and owned dwellings from the savings total in determining the break-even point. The break-even point then approaches the average income in the normal relationship and it can be concluded that the great majority of families do not ordinarily accumulate and hold any savings other than those invested in their homes and insurance (social insurance as well as life and endowment). Other types of savings by and large are made by families with incomes above the average.

This does not mean, of course, that individuals do not at some stage in their lives accumulate savings. The savings pattern of the individual changes as he leaves his parents' home, becomes a 'single' consumer, goes up the earnings ladder as he grows older, takes on responsibility for a family, and so on. The analysis at this point is focused on the behavior at any one date of a population with a characteristic distribution of income and family responsibility. For example, it replaces the dissaving of last year's

[11] It should be recalled that all the figures cited and interpreted here deal with families averaging 3.5 persons. All conclusions must be altered when the distribution of families by size is included in the inferences.

newly married couples to establish their homes with that of this year's, last year's new parents with this year's, and so on.

F Interpretation of Deviations from the Normal Savings Pattern

Since the data seem to confirm a normal savings pattern in relation to the community income that has been fairly stable for a long period and possibly is still, the deviations in periods of change may be explained in terms of previous income experience. For lack of empirical observations that provide any information on the direction and rate of change of incomes in individual communities, the extent of the 'lag' must be estimated. Propositions (c) and (d) imply that the deviations of the savings patterns in given communities at a given time depend on the change in the general income level, but the other variables, prior income level and the elapsed time, cannot be measured directly unless detailed estimates relating to the income experience of individual communities become available. Deviations from the normal pattern of savings, however, offer a basis for estimating these variables on the average.

With the data utilized in this analysis it is possible to compare only the ranges in the savings patterns among communities at a given date. For this purpose it is not necessary to use any curve form. The ratio of the lowest average expenditures to the highest in 1917-19 within a group of communities with the same average income gives a measure of the spread in the savings pattern that can be associated with general information on the course of incomes before 1918. Similarly, the ratio of the highest average expenditures to the lowest in 1934-36 provides the same measure for a different period. These ratios, determined from the data summarized and illustrated in Tables 1 and 2 for each family income class within each community income class, differ with the second variable, community income, but are probably independent of the first, family income. If such variations are ignored, 0.89 for 1917-19 and 1.10 for 1934-36 serve as general averages by which the possible meaning of this measure of the spread in savings patterns at specific dates can be examined.

At this point we must resort to a formal expression for the savings pattern. Equation (3), which describes the normal form at the appropriate boundaries of the range, can be expressed as

$$y = 0.93x^{0.8}z^{0.2} \tag{4}$$

for this purpose. If it is now assumed that the savings patterns of all communities can be described by this form with the appropriate value of z_0, the average community income in some year substituted, if necessary, for the

value of the current year's, z_1, the lowest expenditures in 1917-19 can be expressed as

$$y = 0.93x^{0.8}z_0^{0.2}. \tag{5}$$

If y is known to be about 11 percent below the normal form, the magnitude of z_0 for the extreme deviation from the norm can be inferred.

Thus

$$\frac{z_0^{0.2}}{z_1^{0.2}} = 0.89;$$

hence

$$\frac{z_0}{z_1} = 0.56.$$

This result can be construed to mean that the extreme deviation from the normal savings and expenditure pattern was due to a rise of about 78 percent in the general income level. If, for lack of any other average, the mid-range is taken as a measure of the average deviation, we can conclude that the savings patterns of 1917-19, mainly 1918, were determined by income levels that were about 39 percent below that prevailing then. This, according to estimates of national income per capita, might be related to 1913 and 1914.

Similar calculations for 1934-36, mainly 1934 and 1935, give z_0 a value of about $1.62z_1$. The mid-range value, 31 percent above 1934-35 levels, could be associated with 1930. These inferences suggest that the adaptation to the new levels of income on a rising secular trend may be slower than is assumed in the Modigliani formula and that in the depression years consumption may have declined below peak year values. A hypothesis more consistent with this analysis would argue that consumption in the late '20's was below the norm here defined and thus similar to the patterns of earlier years. When the depression changed the level of incomes, the pattern of consumption established in the early '20's persisted. Such inferences have a rationale that seems reasonable in terms of the general economic situation of these periods.

Similar deductions for other dates require more information on general trends for support. From the correspondence of the 1917-19 and 1934-36 relation to the situations in 1888-90 it can be argued that individual communities were experiencing income changes that balanced on the whole around a fairly stable general trend. In 1901 the trend of incomes was perhaps upward among the communities surveyed. Such inferences are, however, severely qualified by the limitation of the observations to state data. Within states incomes vary so much among communities that the range

within individual communities cannot be based on the classification by the average income of the state.

According to this argument, average income in many cities had declined substantially during 1945-48 but 15 observations are too few to give much significance to the actual range in savings patterns among cities. The correspondence of the 1947 national sample data with the prewar relationship suggests that the changes in individual communities tended to balance in the aggregate. The usual explanation of high postwar consumption was the making up of deferred demand and the availability of liquid assets and consumer credit.

G Farm Savings and Community Income Levels

The main body of data on farm family savings relates to 1935-36 and the analysis in terms of the problem under consideration is handicapped by the circumstance already mentioned, that the tabulations were for combinations of communities with widely different income distributions. This means that for the purposes of this analysis average community income must be estimated for each family income class in nearly half of the area units.[12] The farm savings patterns in 1935-36 show that proposition (b), an inverse correlation between savings and the community income, seems to hold in farm as well as in nonfarm communities. The level of the regression, however measured, is clearly steeper and higher in farm than in nonfarm areas. At the income brackets near the average, however, the farm pattern of savings is not dissimilar to the nonfarm. While the application of this relation to the farm data is perhaps debatable in view of

Average Family Savings

Average Community Income	Projection of the 1917-19 & 1934-36 Nonfarm Relations	Observed Average, Farm Areas *Low*	*High*
	Families with $550 Income		
$350	$80	−$199	$147
690	12	−313	65
770	0	−75	11
	Families with $750 Income		
$350	$148	−$53	$257
690	61	−150	35
770	46	34	96
870	28	67	109

[12] The need for this calculation, in contrast to the device used in the case of nonfarm communities, is imposed by the difference in the number of reports from each area. In the nonfarm samples the cities grouped were approximately of the same size and the number of reports approximately equal.

the wide dispersion among communities, the correlation of the general magnitude of savings with community income is the most promising explanation of the remarkable correspondence of the savings functions of wage earner families in 1888-90 and of farm families in 1935-36 (Table 3). The average money income of wage earner families in 1888-90 was $682 and of farm families in 1935-36 was $667. The numerous problems of measurement encountered in using farm data must be examined before the differences in the form of the savings function among farm and nonfarm populations can be considered significant (see Part VI). The primary difference may be in the wider amplitude of the 'transitory component' of income, both the part that affects an entire community and that which is a matter of individual experience.

Table 3

Family Savings: Wage Earner Families, 1888-90, and Farm Families, 1935-36, Averaging 3.5 Persons

Wage Earner Families, 1888-1890		Farm Families, 1935-1936	
Average Income	*Average Savings*	*Average Income*	*Average Savings*
$161	−$78		
		$178	−$118
333	−20		
		394	−37
495	29		
		643	54
686	93		
875	155		
		901	164
1,080	247		
		1,236	336
1,282	333		
1,490	483		
1,678	603		
		1,734	744
1,870	683		
2,102	891		
		2,362	1,023
2,645	1,330		
		5,095	3,057

H Expenditures and Community Income

When each category of expenditures is examined in terms of its relation to the community income level it appears that only two, food and housing, are consistently and positively correlated. Other categories, such as clothing, transportation, furnishings, and sundry services, vary considerably from place to place and from date to date but these variations, *at a given family income bracket,* are not associated with the general community level of income. These results lead to the conclusion that total expendi-

ture other than for food and housing remains relatively constant in relation to family income; likewise, the sum of food and housing expenditures and savings is relatively constant for each family income bracket. The degree to which these groups have a stable relation to family income is illustrated for the national samples of communities at different dates in Table 4 and Chart 2 and for national samples of farm communities in Table 5. While the data for certain communities deviate systematically from the average, the general tendency toward coincidence applies in the great majority of the 315 area surveys examined. It is reasonable to assume that certain differences are in part a matter of methodology. Thus the averages for farm areas are systematically below the nonfarm in the low income brackets, under $600, and systematically above in the high. This variation may be traced to the farm income concept used for classification since a slight alteration of the income definition would bring the farm and nonfarm data almost to coincidence. The implication of relatively stable totals for the two groups of disbursements is clear, confirming Mr. Kuznets' generalization about the stability of income-savings ratios at the higher income brackets. The explanation of a systematic normal relation of savings with community income and of the deviations is to be sought in the variability of expenditures for food and housing. To a first order of approximation the two groups of disbursements are constant percentages of income. As incomes move to the upper part of the income range, the proportion spent on food and housing tends to level off in certain communities. Thus, if the total, savings plus food and housing expenditures, tends to be a constant percentage of income, and likewise food and housing expenditures, savings must also.

Savings at a given income bracket thus complement expenditures for food and housing. All that has been shown in the way of illustrating the relation of savings to community income holds for food and housing expenditures. There appears to be a normal relation of food and housing expenditures to a community income about which actual outlays in a given place and at a given time deviate and the deviations are, at least in part, explained by secular changes in the general level of community income.

Prices, home production, and the standard of living as they affect the pattern of savings relate to these sectors of consumption. The isolation, if it is possible, of the effect of each factor is an ambitious project in itself. Price alone, as defined for indexes, does not explain the variations in food and housing expenditures among families in the same income bracket in different places or at different dates. Indexes of differences in prices in different places are correlated with the general level of incomes but even

Table 4: Savings and Food and Housing Expenditures, Nonfarm Families, 1888-1944

AVERAGE INCOME	*1888-90*	*1901*	*1917-19*	*1934-36*	*1935-36*	*1941*	*1944*
	AVERAGE SAVINGS						
$150		−$49					
250		−64					
305					−$262		
313							−$656
329						−$165	
335	−$20						
350		−32					
450		5					
491	29						
550		46					
552				−$112			
622					−97		
650		78					
680	93						
736						−73	
750		115					
776							−374
777				−97			
813			$24				
850		149					
856					−66		
884	155						
950		208					
1,050		252					
1,065				−52			
1,068	247						
1,075			78				
1,090					−43		
1,150		277					
1,243							−263
1,268						−87	
1,300		353					
1,324					−5		
1,344			157				
1,352				−17			
1,459	483						
1,566					21		
1,632			234				
1,641				24			
1,759						31	
1,779							−91
1,806					68		
1,925			342				
1,937				83			
2,150					136		
2,252				141			
2,272			448			35	
2,529				194			
2,559							78
2,625					232		
2,744						94	
2,757							175
2,790			630				
2,881				274			
3,300					496		
3,468				384			
3,480							549
3,702						330	
4,224					799		
4,408							903
6,120						1,295	
6,541					1,513		
7,595							2,964
13,478						4,304	

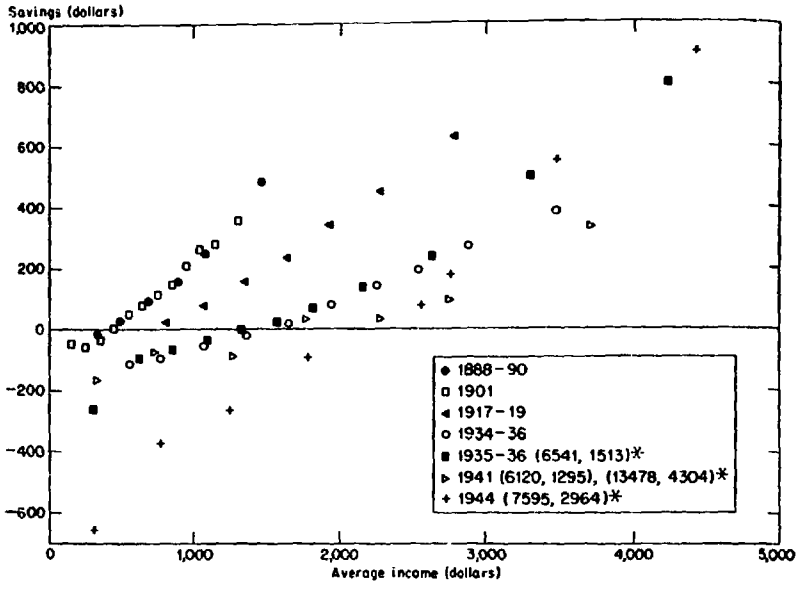
Table 4 (*concl.*)

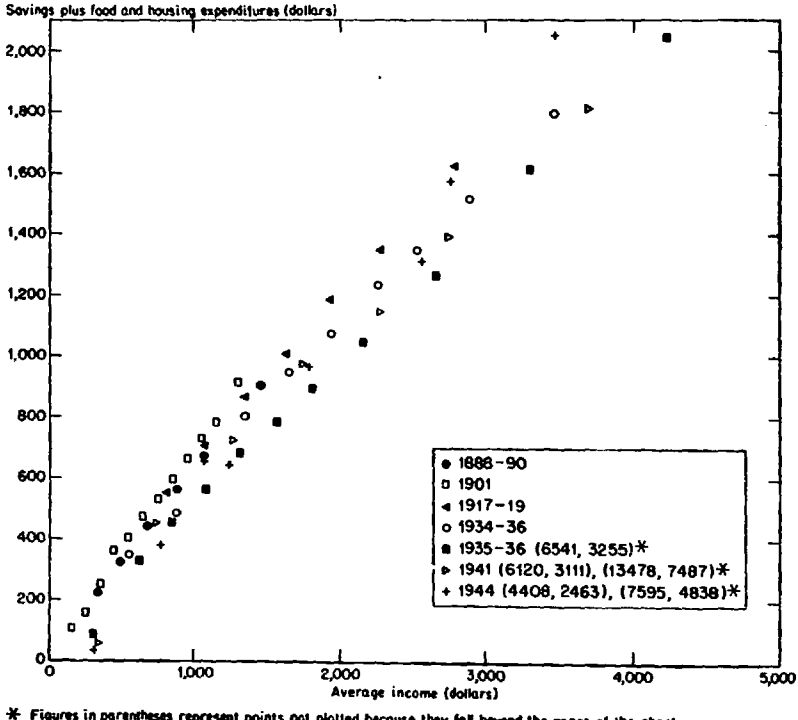
AVERAGE INCOME	*1888-90*	*1901*	*1917-19*	*1934-36*	*1935-36*	*1941*	*1944*
	SAVINGS PLUS FOOD AND HOUSING EXPENDITURES*						
$150		$102					
250		155					
305					$82		
313							$31
329						$63	
335	$221						
350		243					
450		360					
491	322						
550		402					
552				$349			
622					328		
650		466					
680	440						
736						452	
750		525					
776							378
777				486			
813			$550				
850		588					
856					456		
884	563						
950		662					
1,050		726					
1,065				655			
1,068	671						
1,075			706				
1,090					563		
1,150		781					
1,243							642
1,268						723	
1,300		908					
1,324					680		
1,344			865				
1,352				805			
1,459	903						
1,566					782		
1,632			1,011				
1,641				947			
1,759						974	
1,779							967
1,806					893		
1,925			1,184				
1,937				1,074			
2,150					1,045		
2,252				1,235			
2,272			1,348			1,147	
2,529				1,348			
2,559							1,313
2,625					1,264		
2,744						1,393	
2,757							1,571
2,790			1,624				
2,881				1,515			
3,300					1,613		
3,468				1,797			
3,480							2,054
3,702						1,810	
4,224					2,044		
4,408							2,463
6,120						3,111	
6,541					3,255		
7,595							4,838
13,478						7,487	

Note to Table 4 on page 127.

Chart 2

Relation of Savings and Savings Plus Food and Housing Expenditures to Average Income, Nonfarm Families, 1888–1944





* Figures in parentheses represent points not plotted because they fall beyond the range of the chart.

Source: Table 4.

Table 5

Savings and Food and Housing Expenditures
Farm Families, 1935-36 and 1941

Average Income	Average Savings		Savings plus Food & Housing Expenditures	
	1935-36	*1941*	*1935-36*	*1941*
$137		−$171		−$34
178	−$118		$7	
377		61		136
394	−37		136	
628		9		285
643	54		272	
868		42		392
901	164		415	
1,226		296		632
1,236	336		627	
1,701		569		943
1,734	744		983	
2,362	1,023		1,441	
2,439		779		1,378
3,776		1,885		2,426
5,095	3,057		3,595	

if they are confined to the cost of food and housing, price explains only part of the variation in the general community income level and thus only the part of the variation in food and housing expenditures that is associated with the community income position.[13]

Home production of food and fuel for home consumption and the occupancy of owned dwellings tend to be inversely correlated with expenditures on food and housing and also with the level of community incomes at a given time. Thus savings at a given income bracket are larger when food is produced for home use and families tend to own their homes. This factor is clearly a partial explanation of the high farm savings in relation to nonfarm savings at the same level of money income.

Even though price and home production are important variables, the changing standards of consumption that appear to be almost inevitably associated with the community income level may in the long run prove

[13] There have been three studies on which to base this conclusion: *Cost of Living in American Towns* (Board of Trade, Great Britain, 1909); *Intercity Differences in Costs of Living* (Works Progress Administration, Division of Social Research, Monograph XII, March 1935); and 'City Worker's Family Budget', *Monthly Labor Review*, February 1948.

NOTE TO TABLE 4

* The data for average savings were standardized for family size, but the sum of savings and expenditures for food and housing were not adjusted for variation in size of family. An unpublished study indicates that there is no significant difference in this sum between families of different size. The correlation of family size with outlays appears in the distribution of this total.

to be the most important factor in explaining the division of the total allocation between food and housing expenditures and savings. The detailed information on food and housing consumption available from surveys offers convincing evidence of the changing standards of the middle and low income groups in food consumption and type of housing during the sixty years. Among communities at the same time the housing and food standards of the same income bracket clearly vary with the general income level of the community in terms of such indicators as meat, vegetable, and milk consumption, and plumbing, lighting, and heating facilities.

I Implied Aggregate Relationships

The effects of the characteristic changes in the savings pattern, relating family savings to family income, depend upon the distribution of the population by locality and income class. The number of families living in communities of each type (low to high income), and within communities the number of families in each income bracket, determine the importance of the variations in family savings pattern for study of the aggregate data. Variations that might be very interesting from the viewpoint of family behavior might not be significant in their effect on the total if the population concerned was relatively small.

Propositions (a)–(d), which have been examined in terms of the empirical data on family savings, imply similar relationships in the aggregate data which must be rephrased to take account of the joint distribution of families by the size of their incomes and the general level of community income. The manner in which the normal savings pattern specified in the hypothesis would be reflected in the movement of the aggregates would be exceedingly responsive to the changes in this joint distribution of the population by community and family income. For if the simplified expression for the relationships (1) and (2)

$$y = ic$$
$$s = x - y \tag{6}$$

is used to represent the normal relationship, where x, y, and s represent, as before, income, expenditures, and savings of a given income bracket, and where i represents a function of the community income, the aggregates for all communities and all income brackets become $Y = N\,\bar{i}\,\bar{c} + N\,r_{ic}\sigma_i\sigma_c$, $S = I - Y$, where I, Y, and S are aggregate income, aggregate expenditures, and aggregate savings, $\bar{i}$ the average value of the function i, $\bar{c}$ the average value of the function c, r the correlation coefficient between the two functions, and σ_i and σ_c are their standard deviations.

If i and c are nonlinear functions, as was assumed above, the aggregate functions would not appear linear unless the second term for Y is of a magnitude to affect this aggregate. The second term depends on the correlation between family and community income which cannot be estimated with any accuracy for want of the necessary information on income size distributions at different dates. A rough guess based on the size distribution for 1935-36 would place this correlation near 0.2.[14] If the correlation were even much lower, this term, which also depends on the two standard deviations and the number of consuming units, would surely be significant in determining the magnitude of Y. This result may explain in part the paradox of nonlinear patterns of family expenditures and savings corresponding to linear aggregate consumption and savings functions.

Variations from the normal form interpreted in propositions (c) and (d), reflected in the aggregates, depend on a joint distribution in three or more variables, for the former level of community income determining these variations probably differs substantially from community to community. Summation would introduce several correlation coefficients and standard deviations, some of which would surely be sufficiently large to affect the totals.

The essential data on income distribution by community and date are virtually nonexistent. Thus to estimate the possible effects of changes in these distributions the investigator is forced to work only with aggregates in terms of an analytic model that recognizes the possibility of changes in the distributions. Perhaps one effect is to produce an apparent linearity in the aggregate savings functions during periods of similar economic conditions, but there is a serious possibility that such linear forms may be altered substantially by some reasonably small modifications in these distributions of the population.

The aggregate functions relating savings to income, according to this analysis, would differ substantially with economic circumstances. The savings function would have a steep slope at the beginning of an upward movement in income, especially if the recent increase in income was substantial. In subsequent periods of increases in income the slope might diminish almost to zero, a horizontal line. Periods of declining income would produce similar savings functions at lower levels. Thus from this

[14] Though this may seem a low figure in view of the wide dispersion in average incomes among communities at a given time, it may actually be much too high. It results from the fact that the majority of the population lived at that time in communities with fairly similar income distributions.

study of the family savings pattern, at least four types of aggregate savings functions can be expected to appear in the aggregate data and variations on these types doubtless emerge as a result of the unknown characteristics of the distributions of income among families and communities at different times.