A CROSS-SECTION ANALYSIS OF CONTRACTUAL SAVING

by
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Economic literature in the field of saving has focused largely on total saving. In analyzing behavior, total saving must be broken down into components, since different motives may be related to each component. This study deals with one of the largest components: contractual saving. It is defined by the Survey Research Center of the University of Michigan to include payments (1) on life insurance, (2) on the principal of mortgages, and (3) into retirement or pension funds. Contrary to the usual hypothesis regarding saving, many people with low incomes do include saving in their habitual standard of life.

The principal data were derived from the 1948-50 Surveys of Consumer Finances, conducted by the Survey Research Center for the Federal Reserve Board. There are three man phases of this dissertation. (1) A reinterview study is utilized to analyze the flexibility of contractual saving between two years in comparison with other components in the consumer's budget. (2) The analysis of covariance is applied to the data of a single year to see whether or not the separation of the population into contractual savers and non-contractual savers makes a significant difference in explaining discretionary saving. (3) Linear multiple regressions show the factors influencing, within income groups, the level of contractual saving for consumers. While the principal dependent variable is the

amount of contractual saving, life insurance payments and mortgage payments are studied incidentally. The populations tested are varied to include and to exclude non-savers in terms of the respective variables. Also, the fact of payment is distinguished from its absence.

Among the findings the following are salient:

1. Comparing two years, contractual saving exhibits great relative inflexibility within income-change groups. There is not a significantly greater degree of flexibility of contractual saving for those with changes in income of twenty-five per cent or more than for those with smaller changes.

2. While both total saving and expenditures on durable goods are significantly flexible when related to the direction of the change in income, contractual saving is not.

3. Whether the data of 1948 or that of 1949 are used, significantly more variance can be explained by separating savers into those who save contractually and those who do not save contractually; however, separation of discretionary savers in the same fashion does not help in explaining significantly more variance.

4. In explaining the amount of contractual saving both for the high-income group and for the low-income group, (1) disposable income, (2) marital status and children, and (3) education prove to be directly significant. Among high-income people, Negroes have more contractual saving than whites; the young and the old save significantly less contractually than the middle aged in the low-income group.

PREFACE

An empirical dissertation of this type requires access to several sets of facilities and the cooperation of many persons. The observations are drawn from the Surveys of Consumer Finances conducted annually for the Board of Governors of the Federal Reserve System by the Survey Research Center of the University of Michigan. To manipulate the data requires many thousands of IBM cards.

Thanks are due to the Survey Research Center for making the basic data available to me from which I was able to construct my working decks. Funds for IBM cards and for preliminary tabulations were provided by the Horace H. Rackham School of Graduate Studies of the University of Michigan. The Statistical Research Laboratory of the University of Michigan permitted me to spend hundreds of hours in using the IBM equipment there and its staff provided technical advice in the operation of this equipment. In operating an electronic computer, a regression program written by James G. Wendel, while an employee of the Eastern States Standard Oil Company, was very helpful. The School of Public Health of the University of Michigan was liberal in allowing me time to use the IBM equipment which it rents.

I am grateful to my doctoral committee for their wise counsel after reading preliminary drafts of this report. Two men merit special acknowledgment. James N. Morgan was very

generous in giving me time for consultation from the initial stages of this work until its completion. Daniel B. Suits' expert guidance in statistical techniques was a genuine help.

Finally, but most fundamentally, this dissertation could never have been written without the sacrifices of my wife, Mary Ann. I acknowledge her patient tolerance and that of my sons when I could not fulfill normal family responsibilities.

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CHAPTER I

THE ROLE OF SAVING AND ITS DEFINITION

A. The Role of Saving—Classical and Modern Theory

This thesis is concerned with contractual saving. It is the author's purpose to inquire into the question of how flexible contractual saving really is and to gain insights into human behavior concerning contractual saving. Only personal saving will be considered. The business and government sectors of the economy will enter only incidentally. Before embarking on the statistical task, it is appropriate to consider (1) the role of total saving in economic theory, and (2) the concept of total saving itself.

Saving in Classical Theory

The aspect of saving stressed in Classical theory[1] is its relation to productivity and progress. The Classicists argued that increasing productivity depends not only on increasing specialization of labor but also on the accumulation of capital. Capital cannot be accumulated if the entire output that man produces is consumed. Saving, the failure to consume all that is produced, is required to permit the use of factors in the production of capital instruments. Thrift in such a framework of analysis is a glorious blessing. Saving is automatically offset by investment

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[1] We refer to the culmination of pre-Keynesian thought. This Classical theory should not be associated with any one economist.

and real output is a direct function of the stock of capital which was assumed by the Classicists to be fully employed together with labor. During the past twenty years these long-term considerations have been given much less attention, at least in the United States, and the short-term significance of the saving-investment relationship in the theory of income determination has been in the limelight. In 1936, John Maynard Keynes provided the theoretical basis for a new framework of analysis in his General Theory of Employment, Interest, and Money.[1]

According to Classical theory, present consumption is preferred over future consumption. Interest is the reward for saving. The extent to which the disinclination to save is overcome depends on the level of the interest rate, i.e., the level of saving is positively related to the rate of interest. The investment demand for saved funds is inversely related to the rate of interest and this investment demand is considered fairly elastic. If greater willingness to save advances the supply schedule of saving, with investment demand unchanged, a lower interest rate reduces actual saving and increases actual investment until equilibrium is restored. Likewise increased investment demand, with the saving schedule the same, raises the interest rate, with opposite effects on realized saving and investment. In short, saving and investment are equated through changes in the interest rate at positive levels. It is generally assumed in Classical theory that this mechanism would operate with the use of resources at

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[1] John Maynard Keynes, The General Theory of Employment, Interest, and Money (New York: Harcourt, Brace and Company, 1936), esp. pp. 89-309.

capacity. The problem of income determination below capacity does not enter. Since the analysis is in real terms, the level of total expenditures is not considered important except so far as it is related to the price level.

Saving in Modern Theory

In the thirties, a depression of unprecedented amplitude and duration shocked economists into a new position as the Keynesian revolution took place. It became obvious that the economy does not automatically adjust to full employment. Keynes provided the theoretical justification for a new position in 1936 in his General Theory. His is a "theory of expenditure"—a theory in which the decision to spend or not to spend plays an important role. Changes in the quantity of money are no longer automatically translated into changes in the level of spending; instead new money can merely result in increases in the quantity of inactive money. Investment, rather than the quantity of money, now is the crucial determinant of money income. The quantity of money together with liquidity preference, which explains the demand for holding money, determines the rate of interest. The rate of interest and the marginal efficiency of capital, the expected net rate of return from investment, determines the level of investment. The level which income can reach when investment changes depends on the marginal propensity to consume, the increment in consumption divided by the increment in income. Changes in income are associated with changes in output when employment is less than full, and with changes in the price level when employment is full.

Assuming a stable consumption function,[1] as Keynes did, how much income changes can be accurately predicted when income

[1] The relationship between consumption and income.

changes. As a result of the postwar experience, confidence in the stability of the consumption function has been weakened. Now it is known that consumer behavior must be examined in relation to spending and saving as more than a passive factor in determining the level of total spending.

B. The Concept and Measurement of Personal Saving

The Basic Definition

The concept of saving itself needs closer examination. As previously mentioned, our concern will be saving in the disposition of personal income. Businesses will be considered only incidentally. The act of saving—although it may require a positive decision—is usually defined in a negative way as the income of a given period minus the consumption of the same period. The definition of saving in terms of the balance sheet is that of an increase in net assets or equity, i.e., the increase in total assets minus the increase in total liabilities. In other words, an individual's saving is equal to the change in his wealth. There is little controversy over the propriety of including among assets (1) homes, (2) currency and bank deposits, (3) deposits in savings and loan associations, (4) securities, (5) the increase in the equity of policyholders in life insurance companies, and (6) the increase in equity in private pension, welfare, and trust funds.

An individual may dissave either by (1) acquiring liabilities or (2) by using cash or assets convertible into cash acquired prior to the period for which measurements are being made. The claims of the various sectors of the economy must necessarily offset each other.

Gross Saving Distinguished from Net Saving

Depreciation of durable goods, such as homes, is a complication in defining saving. If we measure saving in accordance with our definition, depreciation must be deducted in order to arrive at the increase, or decrease, in the valuation of net assets during the period. However, if saving is equal to that portion of current output which is not consumed, we arrive at a different figure which is larger. The first concept is that of net saving while the second is that of gross saving. Gross saving is larger than net saving by the amount of depreciation, and gross product is larger than net product by the same amount. The "net" concepts are consistent with John R. Hicks' central criterion in defining income and saving: "A person's income is what he can consume during the week and still expect to be as well off at the end of the week as he was at the beginning."[1] Capital goods are instrumental in yielding income. If their owners consumed all of their gross receipts, the capital goods could not be replaced and eventually prospects for future income would deteriorate. According to Hicks, then, depreciation must be deducted in arriving at "net" income.

The notions of gross product and gross saving are the relevant ones in the theory of income determination from existing capacity. If consumer expenditures and government expenditures are constant, gross saving must be offset by investment if aggregate demand is to be maintained. This is not to say that the concept of net saving is a useless one. In the theory of economic growth, at least in the Classical framework of analysis, the

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[1] John R. Hicks, Value and Capital (2d ed.; London: Oxford University Press, 1946), p. 176.

concept of net saving is the relevant one. No single definition is best for the analysis of all economic problems.

"Correct" Definitions, the Attitudes of Consumers towards Concepts, and the Importance of Motivation

Income accounting is complex. Among other technicalities, we could use considerable space to describe the correct handling of imputed income from owner-occupied homes in its relation to saving. We agree with Lawrence Klein that too much time can be spent in determining correct definitions.[1] George Garvy suggests research into the notions of consumers as to what constitutes saving, consumption, and income.[2] Without such research, he maintains, a rational theory of consumer behavior can hardly be set forth.

A more fruitful approach to the analysis of saving behavior is to find out what is motivationally significant. This approach, in order to be successful, must break spending and saving into components since specific motives may be related to each component. Regardless of whether a consumer considers a particular disposition of income to be saving or consumption, we must endeavor to learn more about the motives related to it.

Definitions and the Need for the Prediction of Aggregate Demand

One of the knottiest problems in income accounting is that of the treatment of those consumers' durable goods which form a

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[1] Lawrence Klein, "Savings Concepts and Data: The Needs of Economic Analysis and Policy," Savings in the Modern Economy, ed. by Walter W. Heller, Francis M. Boddy, and Carl L. Nelson (Minneapolis: University of Minnesota Press, 1953), p. 104.

[2] Comment by George Garvy on "Savings Concepts and Data: The Needs of Economic Analysis and Policy" (Ibid., p. 129).

twilight zone between homes and non-durable goods. The Department of Commerce treats expenditures on these goods as consumption expenditures in the year in which the expenditures take place. The Commerce Department's treatment, according to Irwin Friend, is based on the presumption of substitutability of expenditures on durable goods for those on non-durable goods.[1] James N. Morgan has questioned the empirical basis of that presumption.[2] Using data from the Surveys of Consumer Finances[3] of the Survey Research Center of the University of Michigan, he found that over the years 1947, 1948, and 1949, mean saving as a percentage of income was much more stable when he excluded expenditures on durable goods from saving than when he included them. This possibility needs further verification. Mr. Morgan concludes that if such verification is forthcoming, the prediction of total saving would be simplified.

> If true, this would lead to the possibility that the more important problem would be the prediction of durable goods expenditures and housing expenditures, the total saving being relatively easy to predict but consisting of an inflationary and variable component (purchases of durable goods and houses) and two other components which we now wish to discuss.[4]

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[1] Irwin Friend, "The Concept and Measurement of Savings," Savings in the Modern Economy, ed. by Walter W. Heller, Francis M. Boddy, and Carl L. Nelson (Minneapolis: University of Minnesota Press, 1953), p. 94.

[2] James N. Morgan, "The Structure of Aggregate Personal Saving," Journal of Political Economy, LIX, No. 6 (December, 1951), p. 532.

[3] These surveys, based on a national sample, are conducted annually for the Board of Governors of the Federal Reserve System.

[4] Ibid., p. 532.

The other components which Mr. Morgan refers to are contractual saving and other, mainly liquid, forms of saving.

It is not to be understood that by shuffling definitions and selecting one rather than the other, we can more successfully predict spending or non-spending. By removing purchases of durables from the concept of consumption, we necessarily include them in saving; but if this is done, they must be included in investment. To predict fluctuations in economic activity, aggregate spending must be predicted including (1) consumption expenditures, (2) government expenditures, and (3) gross private domestic investment. The durable goods spending must be predicted regardless of how it is classified. By eliminating durables from consumption a more stable consumption function may be obtained. This enhances the possibility of success in the prediction of spending on non-durables. If the motivation for spending on durable goods is different from spending on non-durables, the separation into components is useful.

The Appropriate Concept of Saving in the Analysis of Economic Fluctuations

An individual's contribution to aggregate demand is measured by his total expenditure; it does not matter whether the goods which he currently buys are consumed or not. Therefore, for purposes of analyzing changes in the level of income, a different definition of saving should be considered, namely, that of non-spending, the difference between an individual's disposable income and his total expenditure on goods and services. John B. Lansing and E. Scott Maynes[1] have dubbed this concept "deflationary savings."

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[1] John B. Lansing and E. Scott Maynes, "Inflation and Saving by Consumers," Journal of Political Economy, LX, No. 5 (October, 1952), pp. 383-91.

In studying problems of inflation and deflation, this concept is the relevant one. It is the Keynesian concept; therefore, hardly a new one. However, the emphasis on the definitions of the Department of Commerce in recent economic literature may have pushed it into the background.

The Heterogeneity of Non-Corporate Saving

In conventional national income accounting, the non-governmental sector is divided into the corporate sector and the non-corporate or so-called individual or personal sector. Since there are unincorporated businesses, the dichotomy does not succeed in separating the non-governmental sector into a business sector and a non-business sector. The "personal" sector includes both farm and non-farm enterprises and such special enterprises as private pension, welfare and trust funds, and other non-profit institutions.

It is clear that the so-called personal sector is not homogeneous. Consequently, aggregate personal saving is composed of heterogeneous components. The "business" saving of farmers and non-farm business owners, since it is stimulated by different motives than genuine personal saving, can be expected to behave differently from the saving of "pure" consumers. Consequently, it is better to analyze heterogeneous components separately and then, later, to combine them into larger aggregates.

Using data of 1947, 1948, and 1949 taken from the Surveys of Consumer Finances, Mr. Morgan found that business owners, and to a much smaller extent farmers, account for saving significantly out of proportion to their numbers or to their aggregate income.[1]

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[1] Morgan, op. cit., pp. 529-30.

Apparently the motivation of entrepreneurs to save is stronger than for the non-entrepreneurial population. If an entrepreneur has confidence in the future of his enterprise, several factors may induce him to save more than a non-entrepreneur at the same income level: (1) expected high return, (2) the reluctance of banks to lend to small enterprises, and (3) the availability of a ready outlet for saving. Logically a fourth factor may contribute to the high saving of entrepreneurs in prosperous years. Cyclically profits are the most volatile element in national income. The expectation of low income in years of depression or recession would seem to encourage unusually high saving in good years.

While entrepreneurs save a larger portion of their income than non-entrepreneurs, it is probable that a saving-income regression line over a period of prosperity and depression for entrepreneurs would be much steeper than for non-entrepreneurs. In a period of prosperity, there is a high rate of reinvestment of profits which tends to make saving by entrepreneurs unusually high. On the other hand, in a depression many firms sustain losses over which they have little control. Since business losses by definition represent dissaving, it is a reasonable hypothesis that in a severe depression much of so-called personal dissaving is of the "business" variety.

The Problem of Heterogeneity of Personal Saving in General

The problem of the heterogeneity of "personal" saving goes beyond the inclusion of the saving of unincorporated businesses. If there is any component which is subject to different motivation and has a different pattern of behavior, it is a candidate for separate analysis. However, the separation into components can never be complete enough to explain every variation. Our models must be simple enough to be manipulated. How far should the breakdown

be carried besides recognizing the basic differences between entrepreneurial and non-entrepreneurial behavior? The following conclusion is Mr. Morgan's:

> . . . . an analysis should recognize . . . . the differences between (1) contractual saving, (2) durable goods purchases, (3) house purchases and additions, and (4) other saving.[1]

A Preview of the Following Chapters

As indicated on the first page of this chapter, this thesis is concerned with the first element of saving which Mr. Morgan mentions. There now follows a thumbnail sketch of Chapters 2, 3, and 4 which constitute the main body of the work.

Salient considerations in Chapter 2 are: (1) the concept of contractual saving, (2) its economic significance, (3) its statistical importance, (4) the relative importance of the components of contractual saving, and (5) a possible modification of the Keynesian hypothesis regarding saving.

The justification for further study of contractual saving rests on its basic difference from other saving. We believe the results of Chapter 3 are conclusive in demonstrating a genuine distinction. The details of our approach must wait. Here let it suffice to say that we answer two questions: (1) How does contractual saving change as income changes over two years in comparison with other components in the consumer's budget? (2) Are contractual savers in their discretionary saving behavior similar to non-contractual savers in their discretionary saving behavior?[2]

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[1] Ibid., p. 534.

[2] In this area, we acknowledge a table of Mr. Morgan's which suggests that contractual saving is not a perfect substitute for other saving. See his "Factors Related to Consumer Saving When It Is Defined as a Net Worth Concept," Contributions of Survey Methods to Economics, ed. by Lawrence R. Klein (New York: Columbia University Press, 1954), p. 135.

The object of Chapter 4 is to search for the factors which influence the level of contractual saving. After an attempt to construct a theory in this difficult area, tests of significance are applied by comparing the coefficients of the selected variables in multiple regressions with their respective sampling errors.

Others have performed a multivariate analysis of life insurance premiums.[1] However, there are several aspects of the author's work which make it more comprehensive. (1) He is concerned not only with life insurance premiums but also with the aggregate amount of contractual saving. Also mortgage payments enter but only incidentally. (2) He divides the population into a low income group and a high income group and makes separate analyses for each. (3) He endeavors to explain not only the dollar amount of payments but also attempts to distinguish the fact of payment from its absence.

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[1] Mordechai F. Kreinin, John B. Lansing, and James N. Morgan, "An Analysis of Life Insurance Premiums," Review of Economics and Statistics, XXXIX (February, 1957), pp. 132-158.

CHAPTER II

THE PROBLEM OF INFLEXIBILITY OF SAVING

The Significance of Contractual Saving

Economic fluctuations in The General Theory of John M. Keynes are blamed on the instability of investment. However, if investment falls by fifty percent while saving is equally flexible in the same direction, aggregate spending will be maintained. Hence, the explanation of fluctuations in economic activity depends as much on the inflexibility of saving as it does on investment flexibility. To fully understand the flexibility of saving, we must know the components of saving, since saving is not a homogeneous aggregate. How flexible saving will be depends partially on previous commitments to save. The concept of "contractual[1] saving," which refers to earlier commitments, has been defined[2] by the Survey Research Center of the University of Michigan to include life insurance premium payments,[3] payments into retirement or pension funds,[4] and principal payments on mortgage debt.[5]

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[1] The term "contractual" is not necessarily used in the legal sense.

[2] Alternative definitions more inclusive and/or less inclusive are possible.

[3] Total premiums included.

[4] Includes contributions to company pension plans and government employee retirements funds. Excluded are Social Security contributions and payments on individually-acquired annuities.

[5] Includes repayments of principal on mortgage land contract and other debt owned on owner-occupied homes and farms.

The forms of saving which are not contractual, are "discretionary", i.e., they currently require the making of decisions. If one were to classify these contractual components as to whether they are automatically or non-automatically offset by investment, they would fall into the latter category. (The spending side of the consumer's budget can similarly be divided into contractual and discretionary components.)

The distribution of the population of spending units sampled in the 1950 Survey of Consumer Finances[1] (conducted by the Survey Research Center for the Board of Governors of the Federal Reserve System) into brackets of the various forms of contractual saving is shown in Table 1.

Similar surveys are conducted during January and February of each year. The data, which are gathered from a representative sample of the entire nation, pertain largely to the year just completed. The economic unit which is interviewed is the spending unit. A spending unit is defined as a group of individuals related by blood, marriage or adoption sharing a dwelling unit and pooling their incomes. A single person who is not financially dependent on others is also classified as a spending unit. The objectives of the Surveys of Consumer Finances are well summarized in the following statement:

> The Survey of Consumer Finances seeks to extend our knowledge of the economic position and attitudes of consumers in the United States. It gathers information about their current financial status, their recent spending and saving behavior, their attitudes toward their own financial situation and prospects as well as those of the country as a whole, and their

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[1] Findings based on these annual surveys are published in the Federal Reserve Bulletin—usually during the summer months.

spending and saving plans for the near future.[1]

The reader can refer to the same source[2] for a sketch of the methods used in these studies.

The sample which was used by the author in preparing Table 1 is not fully representative. The same sample was also used in the preparation of Tables 2, 3, 5, and 6 of this chapter as well as in the multivariate analysis (of Chapter 4) which is concerned with the factors influencing the level of contractual saving. In Chapter 4, the sample will be described more fully. Here let it suffice to mention the principal exclusions: farmers and businessmen. These entrepreneurial groups were removed because their motivation for saving is likely to differ from that of the rest of the population.

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[1] George Katona et al., "Methods of the Survey of Consumer Finances," Federal Reserve Bulletin, July, 1950, p. 795.

[2] The article extends from p. 795 to p. 809 inclusive.

TABLE 1

PROPORTION OF SPENDING UNITS SAVING CONTRACTUALLY IN 1949

PART A

LIFE INSURANCE PREMIUMS

	Percentage in Each Group
None	25.6%
$ 1-49	18.6
50-99	19.6
100-199	20.6
200-499	12.6
500-999	2.6
1000 or over	.4
	100.0%
Mean	$118.89
Mean for Payers	$159.87
Number of Cases	2419

PART B

MORTGAGE PAYMENTS ON PRINCIPAL

	Percentage in Each Group
None	80.0%[1]
$ 1-99	1.5
100-199	3.8
200-299	4.9
300-499	5.8
500-999	2.9
1000-1499	.7
1500 or more	.4
	100.0%
Mean	$ 81.62
Mean for Payers	$387.60
Number of Cases	2419

[1] Included are 16.2% of the total number of spending units who paid interest only on their mortgages.

TABLE 1 (continued)

PART C

RETIREMENT OR PENSION FUND PAYMENTS

	Percentage in Each Group
None	84.3%
$ 1-49	2.4
50-99	2.8
100-199	5.1
200-499	4.8
500-999	.4
1000 or over	.2
	100.0%
Mean	$ 32.87
Mean for Payers	$200.73
Number of Cases	2419

PART D

CONTRACTUAL SAVING

	Percentage in Each Group
None	21.6%
$ 1-99	28.3
100-199	15.8
200-399	16.8
400-599	8.6
600-999	5.7
1000-1999	2.4
2000 or over	.8
	100.0%
Mean	$231.95
Mean for Contractual Savers	$295.93
Number of Cases	2419

Source: Unless otherwise indicated, this and the remaining tables in this thesis were computed by the author by manipulating data obtained in the Surveys of Consumer Finances conducted by the Survey Research Center of the University for the Board of Governors of the Federal Reserve System.

The Heterogeneity of Contractual Saving

Previously the futility of analyzing saving behavior in the aggregate was pointed out since saving is not homogeneous. The behavior of heterogeneous components and their underlying motivation must be separately determined. It should not be inferred that contractual saving is a completely homogeneous aggregate. It is not. The recognition of the heterogeneity of contractual saving does not mean that we should drop the concept. Separation into components can never be complete and, indeed, can proceed too far by making analysis extremely difficult because of the multiplicity of small variables. Even though contractual saving is not absolutely uniform in its parts, all of these components have a common element which characterizes them.

The Characteristics of Contractual Saving

The concept of contractual saving needs to be examined more closely. Where is the line between contractual saving and discretionary saving to be drawn? As is the case with most worthwhile distinctions in economics, the dividing line is not sharp: indeed, the distinction between consumption and saving itself is somewhat blurred. What are the characteristics of the components which the Survey Research Center classifies as contractual saving? (1) Each of these components hinges on a previous contract and the fulfillment of that contract limits the possibility of spending on consumer goods. (2) The contractual commitment is of a long-term nature. Need it be? In the twilight zone between contractual saving and discretionary saving, we find the payments on debts arising out of the purchase of durable consumer goods. It can be plausibly argued that any saving which is performed in

response to a previous commitment is contractual.[1] However, if the time period is extremely short, the concept of contractual saving becomes elusive: if one contracts to pay for consumer goods one month after receipt, it would not seem sensible to define the payment at the end of the month as saving. At the other extreme are payments on automobiles which are spread over a period of more than one year.

Should Repayment of Consumer Debt be Included?

There exists the strange but, nevertheless, not altogether uncommon phenomenon of continually being in consumer debt. Some workers have the habit of allocating their weekly paycheck among several creditors, the grocer, the furniture dealer, the clothier, or perhaps a department store; for example, a worker gets into the habit of paying his local Firestone dealer $5 a week. His original debt arose, let us assume, through the purchase of tires. Before his original debt is paid, he will perhaps buy a tricycle for his child. Since he does not want to pay more than $5 a week, he will wait until his total debt is sufficiently low so that he can make an addition to his debt without increasing the amount of the weekly installment payment which is required by the dealer. The purchase of the tricycle will be followed by the purchase of a battery or other accessories, etc. This example is somewhat extreme and purposely so. It does serve to point out that one cannot assume that the dissaving which takes place at the time of incurring an installment debt is followed by a period of saving while the debt is repaid. If a person incurs $1,000 of installment debt which

[1] A more detailed discussion of the role of decision-making in relation to contractual saving will appear later in this chapter.

he never pays off—adding to it as it diminishes, how can his debt payment be classified? Instead of saving to pay off debt, it would seem that he is making consumer expenditures out of income.

The foregoing argument overstates the case against including payments on debt arising out of the purchase of consumer durables in contractual saving. If one buys an automobile on the installment plan, the decision to buy is discretionary; for a period of perhaps two years, this individual's budget behavior certainly is influenced by the debt contract. This is true even if he regularly buys automobiles on credit.

There is no single definition of "contractual saving" which is necessarily the best. The goal of the analysis of saving is to acquire tested hypotheses so that insights into human behavior can be obtained and eventually so that fluctuations in aggregate expenditures can better be predicted. To test a particular hypothesis, a narrow definition of contractual saving may be useful. Whereas, in testing another hypothesis, a broader definition of contractual saving may be relevant. In the analysis of fluctuations in aggregate demand, every contractual commitment to save should be considered, including commitments to purchase government bonds regularly through deduction from paychecks and bank accounts.[1] When income falls, all of these commitments are of immediate importance in making the fall in aggregate demand greater than it would otherwise be. Be that as it may, the author will be using the data of the Survey Research Center which excludes in its definition of contractual saving commitments other than (1) life insurance payments, (2) payments on mortgage principal, and (3) retirement fund payments.

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[1] Estimates of the volume of saving through systematic purchases of government bonds are crude for the nation as a whole and non-existent in available microeconomic data.

The Relative Importance of the Components

The relative importance of the included components is shown in Table 2. It is clear that saving in the form of life insurance[1] is the dominant element while mortgage payments are of intermediate importance and retirement fund payments are relatively unimportant in 1949. The comparative importance of the last component today probably would be greater but the current data of the Survey Research Center do not include the last two components.

That life insurance premiums constitute a larger component of contractual saving than mortgage payments may seem surprising to some in view of fact that the typical mortgage payment is so much larger than the typical life insurance premium. The reason, arithmetically speaking, must simply be that more people make life insurance premium payments. The exact data are given in Table 1. There it is found that although virtually three quarters of the total number of spending units made payments of life insurance premiums, only one-fifth saved contractually in the form of mortgages. The latter fraction may seem suspiciously small to some but is not unrealistic. First of all, although over fifty percent of the population own homes today, there has been a tremendous upward surge since 1949, the year of the data. Secondly, a high percentage of the older homeowners have fully paid for their homes. Thirdly, payments on principal only are included. Sixteen percent of the total number of spending units made payments of interest only.

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[1] In terms of pure saving, the importance of life insurance premiums is overstated for the reason which is explained in the next section.

TABLE 2

COMPONENTS OF CONTRACTUAL SAVING
AS PERCENTAGES OF TOTAL

	Percentage in Each Group
Life Insurance Premiums[1]	50.9%
Mortgage Principal Payments[1]	35.0
Retirement and Pension Fund Payments[1]	14.1
	100.0%
Number of Cases	2419

[1] Estimated by taking group midpoints and multiplying by number in respective groups and then summing.

TABLE 3

EXTENT OF SIMULTANEOUS OCCURRENCE OF
COMPONENTS OF CONTRACTUAL SAVING

	Percentage in Each Group
Life Insurance Premiums	74.4%
Life Insurance Premiums and Mortgage Payments	17.9
Life Insurance and Retirement Fund Payments	14.1
Life Insurance, Mortgage, and Retirement Fund Payments	4.2
Mortgage Payments	20.0
Mortgage and Retirement Fund Payments	4.3
Retirement Fund Payments	15.8
Number of Cases	2419

Table 3 shows the extent of simultaneous occurrence of components of contractual saving. Since a relatively small proportion of the population saved contractually both in the form of mortgages and retirement funds, it follows that the extent of overlapping must be small. It is notable that ninety percent of those who did make payments on mortgage principal also made life insurance payments, while only three-quarters of the whole population did. This may have psychological meaning:[1] those who save in the form of mortgages may have a predilection which finds expression in more than one form. It may indicate a recognition of need: it can be argued that since the mortgagor has a large debt, he needs more protection than those without mortgage debt. It seems more probable that it is simply an income effect. As will be noted later, frequency of occurrence of both forms of saving increases somewhat as income increases.

Saving through Life Insurance Payments

The treatment of life insurance premium payments as saving may seem surprising to some. To be sure, not all of such payments should be so classified. The insurance against a business risk is treated as a cost in conventional price theory. Why should not payments for life insurance be treated as part of the cost of living for the consumer? Indeed, they should be, provided they actually are payments for only life insurance. In the case of a term policy, there is no saving element since the policy has no cash surrender value. As far as the beneficiary of the policy is

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[1] It may merely mean that mortgage payments and insurance payments are a function of age—that mortgage payments are concentrated in those age groups when life insurance payments are more frequent. This is likely to be true of the younger age groups.

concerned, there is only a contingent increase in his or her assets, which likewise, is not customarily considered in measuring saving. However, in the large majority of so-called life insurance policies not only is there a saving element, but it dominates over the insurance element to such an extent that it would be more accurate to call the policies "savings policies".

The face value of the total amount of life insurance in effect in 1950 was $234 billion. Of this total only $57 billion or less than twenty-five percent was term insurance.[1] The premiums on term policies as a percentage of total premiums would be very much smaller than twenty-five percent since, (1) for a policy of a given face value, term insurance is less expensive than other types, and (2) approximately ninety-eight percent of group insurance is term insurance and insurance taken out under the group plan is less costly than when taken out under the ordinary or the industrial plan.[2] Probably not more than ten percent of total premiums are paid on term policies. Of the remaining ninety percent, what percentage represents saving? While available statistics in the aggregate do not yield an exact answer, a very simple method can be used to discover an approximate answer in the case of a given type of policy, viz., by comparing the premium payments with the increment in the cash value of the policy. In the case of a stock company the computation would be simpler than for a mutual company since the premium payments would not have to be adjusted by dividend payments. Regardless of whether one selects a straight life policy or a limited payment life policy, the saving element is surprisingly large. Although the saving element as a percentage

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[1] Life Insurance Fact Book, 1953 (New York: Institute of Life Insurance, 1953), p. 9.

[2] Ibid., p. 9.

of the premiums paid varies somewhat depending on the type of policy and the age at which the policy was taken out, in every case this element is extremely large relative to premium payments. The illustration in Table 4 is based on a $1,000 straight life insurance policy, taken out at the age of thirty with a leading stock company, with premiums payable to the age of sixty-five.[1]

TABLE 4

SAVING IN RELATION TO PREMIUMS PAYABLE TO AGE 65

Age	Increase in Cash Value	Increase as Per Cent of Premiums
30-35	$ 61	54.48%
35-40	95	85.01
40-45	103	92.17
45-50	110	98.43
50-55	117	104.70
55-60	126	112.75
60-65	142	127.07

The annual premium on the above policy is $22.35. The percentages were obtained by dividing the five-year increase in cash value by five times the annual premium. This involves an error on the side of overstating the saving element; if the premiums were paid at five-year intervals coinciding with the increment in cash value specified in the table, they would be higher. However, the magnitude of this error in approximation is slight. One may conclude that the treatment of life insurance premium payments as saving does not involve a gross error.

[1] The Unique Manual (Cincinnati: The National Underwriter Company, 1953), p. 585.

Modification of the Usual Saving Hypothesis

It is appropriate to investigate the relationship between the idea of relatively stable contractual saving and the usual hypotheses concerning the behavior of saving. The most commonly accepted hypothesis since the time of The General Theory has been that saving is a residual, either positive or negative: that there are certain necessaries and comforts of life which constitute one's standard of living, for which one makes a strenuous effort to provide even if income falls; or, if income rises, the plane of living will be adjusted upward only slowly. To quote Lord Keynes:

> For a man's habitual standard of life usually has the first claim on his income, and he is apt to save the difference which discovers itself between his actual income and the expense of his habitual standard; or, if he does adjust his expenditure to changes in his income, he will over short periods do so imperfectly. Thus a rising income will often be accompanied by increased saving, and a falling income by decreased saving, on a greater scale at first than subsequently.[1]

Not only did Keynes maintain that this relation was true over short periods but he also believed, but less firmly, that a larger proportion of income would be saved as real income increases over long periods. The implication is that present needs are valued more highly than future needs.[2] The latter may be either partially or entirely neglected, that is, there may be no effective realization of the need for saving. The concept of relatively stable contractual saving conflicts with the foregoing hypothesis as it is usually interpreted and as Keynes intended it to be interpreted. His habitual standard explicitly referred to expenditure, not saving. However,

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[1] John Maynard Keynes, The General Theory of Employment, Interest, and Money (New York: Harcourt, Brace and Company, 1936), p. 97.

[2] This was stated by economists preceding Keynes.

there is no reason to suppose that in a high income economy—such as our own—that there may not be a provision for saving as well as a provision for consumption. While it is true that people may establish as an objective a certain plane of living, it is equally true that they may set up an objective of accumulating a given volume of savings. Both objectives are worthy and rational from the individual's point of view. The primacy of one or the other is not at all clear in individual cases. This, of course, is true only within limits. It would be ridiculous to assert the primacy of the accumulation motive when income falls so far as to present starvation or accumulation as the alternatives facing the consumer. Expenditures to sustain life do constitute the first charge on income. Nonetheless, one should not overemphasize the inflexibility in the standard of consumption expenditure.

Several years ago the author experienced a sizeable reduction in income when he resumed graduate work. Previously, he had subscribed to a life insurance policy which was chiefly a "savings policy". The saving objective was regarded as being at the minimum level—to be amplified when income would increase. Accordingly when income dropped, the author instead of adjusting his savings objective downward, adjusted his plane of living. Undoubtedly, many "family" men feel a responsibility for meeting a minimum savings objective. In conflict with the Keynesian idea that saving is a luxury, it may be just as necessary for a person with foresight to save as it is for him to buy an additional pair of shoes. Why? The answer is obvious in the extreme case of zero future income. It is similarly true if a person's future needs and those of his family are expected to rise relative to his expected future income, whatever the income level may be. Even if income is expected to expand faster than needs, the great uncertainties of modern times

provide a motive for individual intentions to save. The existence of a motive for saving is no guarantee of its occurrence. The foregoing saving behavior presupposes greater foresight than many people have. Even though there may be an awareness of future needs, saving may not take place because of (1) excessive optimism, (2) insufficient strength of will, and (3) inability to find a stable store of value.[1]

Be that as it may, the fact remains that there is a strong motivation to save to provide for future needs. The awareness of these future needs has been substantiated by the results of the Surveys of Consumer Finances:

> The most common answer given during the war was that they had put money aside for future contingencies. Saving for "rainy days," for unexpected developments like illness or unemployment, for old age, and for the future needs of children were mentioned in explanation of specific actions.[2]

The act of saving may become part of the activities included in the consumer's "habitual standard" without full consciousness. The consumer commonly fails to recognize the saving element in premium payments on life insurance policies and on repayment of debts.[3] Therefore, the consumer in maintaining what he thinks to be

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[1] These are considered to be factors which may contribute to deviations from "rationality" as conceived by Kenneth E. Boulding in his Theory of Rational Saving. See his Economic Analysis (revised ed.; New York: Harper & Brothers, 1948), pp. 746-749.

[2] George Katona, Psychological Analysis of Economic Behavior (1st ed.; New York: McGraw-Hill Book Company, Inc., 1951), p. 78.

[3] In the annual Surveys of Consumer Finances, questions have been asked with respect to specific components of saving which the respondents may or may not regard as such. In these surveys, it has been found that the percentage who actually save is much higher than those who realize they do in the interim surveys of the Survey Research Center. In the latter studies, people have simply been asked whether or not they do save.

a habitual standard of expenditure, may actually be maintaining a habitual pattern of saving. This is an additional reason for qualifying the Keynesian saving hypothesis.

Decision Making in Relation to Contractual Saving

A key factor which differentiates contractual saving from discretionary saving is the way that it enters into the decision making process. The traditional theory of consumer behavior was first developed by the so-called Austrian school in connection with the theory of demand. Before any good is bought, it is assumed according to this theory, an individual carefully weighs alternative purchases of goods and then chooses deliberately among them according to the principle of equating the marginal utility derived from each of them. If such were the case, every action would be preceded by a real decision. However, to assume such behavior is unrealistic. There is a large segment of behavior which is habitual. The acuity of the decision making process varies greatly. A person may purchase a pack of the same brand of cigarettes that he has been buying for the past five years as if he were an automaton. He previously decided that he enjoys cigarettes and that their purchase does not interfere with the satisfaction of more important needs while they are priced within a certain acceptable range. Having once made this decision, he need not redecide at the time of each purchase. The decision to spend or to save is made in many cases for a series of acts which extend into the future. Although the later acts in the series are routine in character, they need not be criticized as being non-economic. The disutility involved in carefully weighing alternatives can more than offset the gain in utility which would be experienced because the best alternative is selected rather than one which is somewhat inferior.

As the purchase price of the good increases, the decision-making process becomes keener. No one would buy a house in the mechanical fashion in which most people buy cigarettes. Moreover, even the purchase of cigarettes or beer may not be mechanical forever. The decision to buy them was conditioned by the recognition of a certain set of circumstances—income position, expectations of income, price expectations, asset holdings, need to provide for a certain number of dependents, etc. Given a change in these qualifying circumstances, the previously inflexible budget behavior will be reconsidered and adjusted accordingly. In the face of the new conditions, perhaps an additional dependent, habitual expenditures for entertainment may be sacrificed for the more pressing need of providing for the new baby. Psychologists agree that the foregoing description is realistic, for example:

> . . . . in human conduct flexibility is a function of the subjective realization of new conditions, and rigidity a function of the lack of such realization.[1]

The foregoing description of the decision-making process and the subsequent restriction of consumer choice applies to decisions to save as well as to decisions to spend. If major decisions to save are made, future acts of saving are relatively inflexible. For example, a person in taking out a life insurance policy, reaches a decision to make payments for a long period of time. Having realized the wisdom of the decision, there is a strong motivation to continue payments even in the face of adversity.

The decision to save contractually may be made because of a realization of the difficulty of saving in any other way. Although one recognizes the desirability of saving, the temptation to consume

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[1] Katona, op. cit., p. 28.

one's entire income is nearly always great. One may commit himself to a long-term saving program so that through the discipline of this commitment he will be able to overcome the temptation to spend. The compulsion of this discipline is "psychological".

As a consequence of the psychological factor, (1) total saving may be more stable over the cycle than would otherwise be the case, (2) total saving may increase in all phases of the cycle. A conclusion drawn from life insurance data to determine how important the psychological factor is in enabling people to save would likely be more reliable since these data are less affected by changing legal and institutional factors than are data on mortgage payments or retirement fund payments. Mortgage regulations of the federal government change; the institution of pension funds has been expanding in the postwar era. In contrast (1) the institution of life insurance had reached a high state of development a quarter of a century ago and hence, there is less possibility of error in exercising judgment in interpreting the effect of contemporary institutional changes upon available statistics; (2) life insurance is available to a wider cross section of the population since it can be purchased in very small as well as in large amounts. The same is not true of mortgage debts.

The compulsion to continue other contractual payments may involve a factor other than the "psychological". It may stem from the aversion to a real economic loss[1]—a factor which is relatively unimportant in the case of life insurance since a life insurance contract involving a saving element usually has a cash surrender value. The failure to meet a mortgage payment, on the other hand, may involve a complete loss of the mortgagor's equity if the real estate is sufficiently depressed so that the market value of the home does not

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[1] It is not inferred that psychologists are unconcerned with real life.

exceed the amount of the debt. Even withdrawing from a pension plan may entail an economic loss.

To sum up—two factors tend to make contractual saving relatively stable: (1) the habitual response to a previous decision governed by a set of circumstances which still prevail; in the case of repayment of debt, there is an additional factor, viz., (2) the economic loss suffered by prematurely discontinuing a long-term commitment to save. It would seem that these characteristics are sufficient to distinguish contractual saving from discretionary saving not only conceptually but behavioristically.

While hypotheses that regard saving as a homogeneous aggregate may be useful as a first approximation, we must go beyond that. Keynes treated saving as homogeneous and listed numerous subjective and objective factors influencing its behavior. However, most of these factors were regarded as unimportant in the short run. An accurate summary of his position is that the only important variable upon which saving depends is income and that saving varies directly with income not only absolutely but as a per cent of income. This proposition may be true for discretionary saving behavior. It is much less likely to be true for contractual saving behavior. It is logical to expect people to tenaciously maintain contractual saving as income falls; and, that as income rises, to expect that contractual saving will be adjusted upward more slowly than discretionary saving. This judgment is based on the hypothesis that many people try to include contractual saving in their habitual standard of life. To the extent that people succeed in doing this, we would expect contractual saving to behave, as income changes, more as consumption expenditures are usually hypothesized to behave than as saving. However, while some people may succeed in achieving their contractual saving objective, others may not. To the extent that this

happens, part of contractual saving might be expected to behave more like "Keynesian" saving.

A Look at Saving-Income Data

How contractual saving changes as income changes over two years will be investigated in the next chapter. As a preliminary, let us look into the behavior of contractual saving and its components for different levels of disposable income as of a given year, and also to see whether the behavior of contractual saving can be distinguished from that of net worth saving. On the basis of the foregoing reasoning it would seem that it can be. It is generally known that net worth saving is not positive at low levels of income for the typical spending unit. The usual explanation is not merely in terms of extremely low income but also in terms of temporary income declines, emergencies, and unusually large purchases of durable goods. Any budget component which is in the habitual standard of life must be positive. There is no reason for expecting that contractual saving will be omitted from the habitual standard of spending units with low incomes.

TABLE 5

CONTRACTUAL SAVING AND NET WORTH SAVING AS MEANS OF MIDPOINTS OF DISPOSABLE INCOME GROUPS

Disposable Income (Midpoint)	Mean Contractual Saving	Col. 2 as Percent of Col. 1	Mean Net Worth Saving	Col. 4 as Percent of Col. 1	No. of Cases
$ 500	$ 33.75	6.75%	$-164.71	-32.9%	272
1500	72.09	4.81	-138.22	- 9.2	450
2500	144.87	5.79	25.95	1.0	575
3500	264.76	7.56	168.33	4.8	496
4500	348.56	7.75	792.97	17.6	319
6250	531.96	8.51	529.60	8.5	224
8750	705.61	8.06	1474.52	16.9	41

In Table 5, the mean contractual saving and the mean net worth saving for the various disposable income groups, with the exception of the top open-end group, are presented.[1] These means also are expressed as percentages of the midpoint of their respective income groups. It is apparent that the relationship of both concepts of saving to income is powerful. Yet there is considerable dissimilarity in their behavior. First of all, while net worth saving is negative for the two bottom income brackets by the amounts of $164.71 and $138.22 respectively, contractual saving is positive. It is true that contractual saving, by very definition, cannot be negative but it could be zero. Secondly, contractual saving exhibits remarkable linearity while the behavior of net worth saving is much more irregular. Thirdly, contractual saving is approximately proportional to income while net worth saving is not at all proportional;[2] it increases much more rapidly than proportionally up to an income level of $5,000; then it dips as a percentage of income for the next income group and then rises again.

The approximate proportionality of contractual saving to income is really a striking feature since saving is ordinarily expected to increase more than proportionately as income increases. The general contractual nature of the saving can hardly explain this phenomenon. What reasons are there for explaining the phenomenon in terms of the specific components of contractual saving?

(1) A cogent argument can be presented in the case of the largest component of contractual saving. The person whose life is insured is motivated by the desire to maintain a certain standard

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[1] The mean saving figures are influenced by those spending units which have no saving.

[2] Lack of proportionality, of course, can be due either to a lack of linearity or if there is proportionality, to the failure of the vertical axis intercept to be zero.

for his dependents. It would seem natural for this standard to be geared to his present plane of living, which is income-determined. It would be unrealistic to argue that sufficient insurance is typically carried to fully achieve a maintenance of the present plane of living for dependents of the insured. In this sense, the breadwinner is usually "underinsured" whether he enjoys a high income or a low income. The "underinsurance" does not destroy the argument. (2) Contributions to retirement schemes are commonly arranged so that the deduction from the worker's paycheck is proportional to income or approximately so. However, not all occupations are covered. Probably a higher percentage of the lower income groups lack coverage. (3) On theoretical grounds, can it be argued that willingness to make housing payments increases proportionately as income increases, or more or less than proportionately? Theory does not provide a clearcut answer to this question. The graduate student with a family probably would respond differently from the comfortable bachelor. While the latter would likely increase his expenditures less than proportionately, the former is forced to live cramped in inadequate housing. The suppressed desire for adequate housing is likely to find expression in housing expenditures which increase more than proportionately should income rise. There is no reason for precluding the possibility of average behavior providing proportional results. The behavior of housing expenditures and mortgage payments, of course, need not parallel each other as income rises. It would be surprising if mortgage payments did at low levels of income. In order to buy a home, a down payment must be made. The difficulty of making a down payment is a serious obstacle for a person of low income. Therefore, it is likely that the middle income groups (compared with the low income groups) would make mortgage payments which are more than proportional to income.

TABLE 6

DISTRIBUTION OF THE COMPONENTS OF CONTRACTUAL SAVING BY DISPOSABLE INCOME GROUPS (WITH MEANS)

PART A

LIFE INSURANCE PREMIUMS

Life Insurance Premiums	Disposable Income							
	Less than $1000	$1000-1999	$2000-2999	$3000-3999	$4000-4999	$5000-7499	$7500-9999	$10000 or more
None	63.2%	43.6%	22.6%	12.7%	10.3%	8.9%	14.6%	0.0%
$ 1- 49	25.7	30.3	22.3	14.5	8.5	5.8	2.4	4.8
50- 99	7.0	15.3	27.5	25.4	18.8	18.3	4.9	0.0
100- 199	3.3	8.0	21.2	32.1	33.2	23.7	17.1	16.7
200- 499	0.4	2.4	6.1	14.5	25.1	34.4	39.1	28.6
500- 999	0.4	0.4	0.3	0.8	3.8	8.9	19.5	30.9
1000 or more	0.0	0.0	0.0	0.0	0.3	0.0	2.4	19.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Mean Premiums	$ 20.68	$ 42.94	$ 81.91	$127.62	$185.82	$237.95	$342.07	$586.90
Premium as Percent of Class Midpoint	4.1%	2.9%	3.3%	3.6%	4.1%	3.8%	3.9%	*
Number of Cases	272	450	575	496	319	224	41	42

*Not computed for the open-end group.

TABLE 6

PART B

MORTGAGE PRINCIPAL PAYMENTS

Mortgage Principal Payments	Disposable Income							
	Less than $1000	$1000-1999	$2000-2999	$3000-3999	$4000-4999	$5000-7499	$7500-9999	$10000 or more
None	95.6%	94.4%	84.5%	75.0%	65.9%	59.5%	61.0%	59.5%
$ 1- 99	0.7	0.7	1.7	1.2	2.8	2.2	0.0	2.4
100- 199	1.1	2.2	2.6	5.8	6.3	6.2	4.9	0.0
200- 299	1.5	1.8	4.7	5.7	9.7	8.5	2.4	0.0
300- 499	1.1	0.9	5.2	8.9	8.8	9.8	12.2	9.5
500- 999	0.0	0.0	1.0	3.0	4.7	8.9	17.1	16.7
1000-1499	0.0	0.0	0.3	0.2	0.9	2.7	2.4	9.5
1500 or more	0.0	0.0	0.0	0.2	0.9	2.2	0.0	2.4
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Mean Payment	$10.11	$11.66	$49.57	$87.80	$134.42	$211.61	$220.73	$326.19
Mean as % of Class Midpoint	2.0%	0.7%	2.0%	2.5%	3.0%	3.4%	2.5%	*
Number of Cases	272	450	575	496	319	224	41	42

*Not computed for the open-end group.

TABLE 6

PART C

RETIREMENT FUND PAYMENTS

Retirement Fund Payments	Disposable Income							
	Less than $1000	$1000-1999	$2000-2999	$3000-3999	$4000-4999	$5000-7499	$7500-9999	$10000 or more
None	98.9%	94.0%	87.6%	77.1%	77.6%	66.5%	78.1%	71.5%
$ 1- 49	0.7	3.3	2.6	2.0	2.5	3.1	0.0	0.0
50- 99	0.0	1.8	2.8	4.7	2.8	4.5	2.4	2.4
100-199	0.4	0.9	5.8	7.9	7.0	10.3	2.4	0.0
200-499	0.0	0.0	1.2	7.9	9.8	14.3	9.8	9.5
500-999	0.0	0.0	0.0	0.2	0.3	0.9	7.3	9.5
1000 or more	0.0	0.0	0.0	0.2	0.0	0.4	0.0	7.1
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Mean Payment	$ 0.74	$ 3.52	$15.05	$43.65	$44.87	$74.44	$89.63	$187.50
Mean as % of Class Midpoint	0.1%	0.2%	0.6%	1.2%	1.0%	1.2%	1.0%	*
Number of Cases	272	450	575	496	319	224	41	42

*Not computed for the open-end group.

Let us examine the data. In Table 6 is shown the distribution of the components of contractual saving by disposable income groups as well as the mean saving figures in absolute terms and in relation to the midpoints of the disposable income groups.

In general, the results confirm our expectations. Life insurance premiums are roughly proportional to disposable income. In the case of retirement fund payments, apparently there is proportionality at disposable income levels above $3,000. Below $3,000 of disposable income, retirement fund payments are a smaller percentage of income. The lower income groups are populated by two groups which simply do not make retirement fund payments: the unemployed and the retired. Furthermore, quite a few of the low income people who do work are in non-unionized occupations and are not covered by pension plans: domestic workers, gasoline station attendants, many of the clerks in retail stores and those in part-time odd jobs, for example. Mortgage payments are a lower percentage of disposable income for those below $3,000 of income than for those above $3,000 of disposable income; and the percentage increases from a level of $1,000 to a level of $7,500. It should be noted that in the lowest bracket of income, mortgage payments are a higher percentage of income than in the group immediately above, whereas this is not so for retirement fund payments. Those temporarily unemployed try to maintain their home ownership while retirement fund payments are automatically discontinued. This fact again points to the heterogeneity of contractual saving. In this aspect retirement fund payments are inherently different from payments on life insurance policies and mortgages—in fact, they are not "sticky" at all.

The Statistical Importance of Contractual Saving

The theoretical significance of contractual saving was explained in the opening paragraph of this chapter. In order to dramatize the potential importance of contractual saving, imagine the following situation. Suppose three-quarters of total saving is contractual; then investment drops to fifty percent of its former level. If the previous commitments accounting for contractual saving were completely inflexible, clearly there would exist a strong deflationary force in the economy. This may seem to be an extreme example but it is not. Messrs. Lansing and Maynes have divided "deflationary" saving into its contractual and discretionary components. The results are shown in Table 7.[1] Spending units are ranked into deciles according to their income. The mean deflationary saving for each decile is shown as well as the mean contractual saving. To obtain discretionary saving, contractual saving is subtracted from deflationary saving. Since contractual saving is always positive, discretionary will be positive only if deflationary saving is both positive and greater than contractual saving. For the top decile deflationary saving is positive but contractual saving is 158 per cent of deflationary saving. Since deflationary saving is negative for all other deciles, discretionary saving is negative by still larger amounts. If contractual saving were expressed in relation to net worth saving for 1949, it would assume a smaller relative importance and the level of discretionary dissaving would be smaller. Table 5 is useful for such a comparison. However, as previously mentioned, for analyzing fluctuations in income, the concept of "deflationary" saving is more relevant. It is true that the volume of discretionary dissaving

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[1] Lansing and Maynes, op. cit., p. 390. Deflationary saving is non-spending. "Investments" of individuals in businesses, houses, and cars are deducted from income as well as spending on non-durables.

TABLE 7

CONTRACTUAL AND NONCONTRACTUAL ELEMENTS OF DEFLATIONARY SAVING FOR SPENDING UNITS WHEN RANKED BY 1949 INCOME

Spending Units Ranked from Top Income Decile to Lowest Decile	Mean Net Deflationary Saving of Each Decile	Mean Contractual Saving	Mean Discretionary Saving
I	$ 430	$680	$ - 250
II	-260	350	- 610
III	-310	260	- 570
IV	-250	260	- 510
V	-240	170	- 410
VI	-150	140	- 290
VII	-170	120	- 290
VIII	-330	60	- 290
IX	-180	50	- 230
X	-650	40	- 690

relative to deflationary saving would be smaller if measured over a period of time which would encompass the business cycle. "Inflationary" dissaving is unstable insofar as it is supported by consumer credit which does not bear a stable relation to income. Support of "inflationary dissaving" by liquidation of liquid assets—a temporary phenomenon—can be a further reason for overemphasizing the relative importance of what contractual saving would be from a longer term point of view. Although this may be true, the tremendous importance of contractual saving is very clear.

Even if contractual saving were of a lesser magnitude, it would be a candidate for separate analysis. Its tremendous importance makes it an obvious candidate. If contractual saving is fairly stable, this would prove particularly helpful in the prediction

of saving. The attention of other researchers could then be focused on the other components of saving.

Summary

The explanation of fluctuations in economic activity depends in part on the inflexibility of saving. Contractual saving may be significant in exhibiting less flexibility than other saving. In the analysis of fluctuations in aggregate demand, both contractual commitments (1) to save and (2) to spend are relevant. We are concerned only with the first aspect. We study that aspect within the limits of the data made available to us by the Survey Research Center of the University of Michigan.

Contractual saving has been defined by the Survey Research Center to include (1) life insurance payments, (2) principal payments on mortgages, and (3) payments into retirement or pension funds. These commitments are listed in the order of their magnitude. Although contractual saving is not perfectly homogeneous, (1) each component hinges on a previous contract the fulfillment of which limits the possibility of spending on consumer goods; (2) the contractual commitment is long-term. The distinction between contractual saving and discretionary saving is not sharp. The discretionary portion of total saving increases as the period under consideration lengthens.

Two factors would seem to make contractual saving relatively stable: (1) the habitual response to a previous decision governed by circumstances which still prevail, and (2) the economic loss suffered by prematurely discontinuing a long-term commitment to save.

Economists usually hypothesize that man has a habitual standard of consumption which constitutes the first claim against

income, while saving is a residual which can be afforded only if one's income is fairly high. A modification of this hypothesis is possible. The motivation even for people with fairly low incomes to include saving in their habitual standard is strong. Within limits, the primacy of the motive to consume over the motive to accumulate is not always clear.

A brief look at saving-income data revealed that contractual saving, in contrast to net worth saving, is approximately proportional to income; (2) mean contractual saving is large relative to mean deflationary saving for spending units ranked in deciles.

CHAPTER III

IS CONTRACTUAL SAVING BASICALLY DIFFERENT?

The Questions to be Investigated

In Chapter 2, the significance of contractual saving as well as its motivational difference from discretionary saving was considered. A look was taken at saving-income data which confirmed a behavioristic difference between contractual saving and net worth saving. However, this work was merely preliminary to a more thorough investigation of the following question: "Is contractual saving in its statistical behavior significantly different?" Two approaches to this question will be used. (1) How does contractual saving change as income changes over two years in comparison with other components in the consumer's budget? Is it really much more inflexible? If it is, contractual saving must be different at least in one respect. (2) In their discretionary saving behavior, are contractual savers similar to non-contractual savers?[1] If so, contractual saving is basically different from discretionary saving and it constitutes an addition to other saving, at least in part. An elaboration of the first approach will now be presented.

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[1] The author is indebted to Daniel B. Suits for suggesting the technique which was used to investigate the latter question.

A. The Inflexibility of Contractual Saving between Two Years

The Selection of a Method for Measuring Rigidity

Empirical tests of the rigidity or contractuality of saving can be devised depending upon the nature of the data to be employed. The author was interested in the use of microeconomic data of the Survey Research Center of the University of Michigan. The data available were of two types: (1) data pertaining to a sample of respondents who were interviewed only once to obtain information mainly about the year just ended; (2) data obtained from people who were interviewed twice, i.e., at the end of successive years, to obtain data concerning what happened in each of the preceding years. The data of a given year can, of course, include backward-looking variables, e.g., people can be asked what changes have occurred in the period just ended in comparison with the previous period. In most of the Surveys of Consumer Finances people have been asked whether their income for the year just completed was about the same as it was the previous year, somewhat larger or smaller, or much larger or smaller. The dividing line between a change of large magnitude and one of "somewhat" magnitude is a change of twenty-five percent. Therefore, it is possible to compare people of different income-change groups. If a budgetary component is "contractual" or rigid, it should be a lower percentage of income for people whose income has risen than for those people whose income has remained the same or has fallen. While the author did analyze data of a one-year study using this empirical test, he abandoned this approach, however, in preference for an analysis of data from a reinterview study for the reasons which will be given.

In the reinterview approach, also the population was divided into income-change groups which in turn were subdivided into the proportion of people saving (or spending) more in the second

year, saving (or spending) less, or the same. The word "same" is to be interpreted broadly. It means "in the same bracket in the second year" as in the first year; "more" means in a higher bracket in the second year; and "less" means in a lower bracket in the second year. If a component is truly "income-inflexible", the proportion of people in the "larger-outlay" group should not vary much between income-change groups; likewise for the "smaller-outlay" and the "same" group. Whereas, if a component is "income-flexible", the proportion in the larger-outlay group should be considerably larger for the "income-change-up" people than for the "income-change-down" people; and contrariwise for the smaller-outlay group. The reasons why the components of contractual saving (and, hence, the aggregate) can be expected to be relatively rigid with respect to income change were explained in Chapter 2. This rigidity is purely of a short-term nature. It should not be inferred that a man who receives an unexpected promotion from a position paying $5,000 a year to one paying $7,000 a year will permanently keep all of his former "contractual" payments at their former level. The data of Chapter 2 have shown that contractual saving is a fairly constant percentage of income. To reconcile the short-term rigidity with the latter fact, it is necessary to assume a lag in the adjustment of contractual saving to a higher (or lower) level of income. This lag presupposes that there is a "normal" relationship between the level of income and contractual saving but not necessarily proportionality to income. Neither does it mean that everyone with the same level of income will have the same structure of spending and saving.

Now let us consider the reasons for preferring data from a reinterview survey rather than data from a single Survey of Consumer Finances. Our interest is in the concept of the marginal

propensity to make outlays, although statistically only an approximation of it will be achieved. How is it best to achieve such an approximation? A reinterview study provides the actual income change as between two years. Also we know how much saving (or spending) there has been in both years. The change in the latter is measured concurrently with the change in the former. In other words, a true measure of the marginal propensity to act (or not to act) is obtained. When a single year's data are used, differences in the behavior of income-change groups are noted. Here too the differences in behavior are measured over the same period for which the income change is estimated. In that respect the two approaches are similar. Nevertheless, we are asking a different question: In the one case, we ask: How did people whose income changed by a certain amount from last year change their outlay on life insurance (or something else) since last year? In the other case, we ask: How do people within different income-change categories differ in the amounts they devoted in life insurance payments within one given year? The reinterview approach has greater appeal.

The one-study approach requires an inference that the reinterview approach does not. It infers that if people have, e.g., a decrease in income, they were saving some "normal" amount last year and now are saving less than the normal amount because of a decrease in income. The inference can be framed in simpler terms: the people without a change in income are taken as the basis of comparison since it is reasonable to assume that they are behaving as they did last year. (Actually they may not be, but this assumption is, nevertheless, implicit.) If the people in the other groups behave differently it is presumably because their income has changed since last year; e.g., if the people with an increase in income are spending more on durables than the people in the income-unchanged group, it is because their income has risen relatively to that group.

Furthermore, the income-change variable is more accurate in the reinterview study which was used. If people are asked what their income has been in the preceding year and whether it has changed since the previous year, the answers may not be precise even if the respondents are very cooperative. The concept of income is complex for the average person since it is composed of not simply one positive element but several and perhaps some negative elements. The respondent unconsciously may think merely of salary or wage income. If so, an erroneous answer is received if wage income has risen but other income has fallen to more than offset the rise. The people of the Survey Research Center, fully appreciating these difficulties, do not obtain information with respect to the level of income in a Survey of Consumer Finances merely by asking a single question; rather they ask many questions with respect to the components of income, edit the replies, integrate the results, and finally compile worksheets to arrive at a more accurate figure for the level of income. In the 1947-1948 reinterview study,[1] these reasonably accurate figures for the two years were actually compared to derive the income-change variable. It was not merely a matter of asking people at the end of 1948: "Has your income changed since last year?" However, the income-change variable for a single Survey of Consumer Finances is obtained by simply asking people whether their income has changed and by how much. There can be but little doubt that the former method gives a better measurement.

Furthermore, the reinterview approach is likely to be superior to the single study approach in that it removes wholly or partially the effect of variables which the other approach does not.

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[1] This reinterview study was mainly relied upon because later studies did not have data either on contractual saving or on total saving.

Hence, the danger of spurious correlations diminishes. Purchases of durable goods are used in the following examples although the same principle would apply generally. Suppose it is found from analyzing the data of one study that people whose income has decreased spend much less on durables than people whose income has remained the same or risen. Should we conclude, therefore, that this behavior is due to the decline in income? The correlation may be spurious. Suppose that "old" people (say, those over 65) do not buy durables (or only small amounts infrequently). As they become old, simultaneously their income is declining due to retirement and only partial employment. It can be seen how easy it is to come to an erroneous conclusion. All old people may spend significantly less than the young on durables regardless of their change in income. To eliminate the age effect, it is necessary to subdivide the income change groups into age groups. In the reinterview study, spurious correlations are less likely. The old people would be old in both years and would possibly spend nothing on durables in both years.

Suppose the following table represents the proportions of various income-change groups that spent more on durables in year 2 than in year 1, or spent less or the same amount. The "same" group includes those who did not make purchases of durables in either year. Let us make the extreme assumption that all of the people over 65 are in the "same" group. The table then can be used to see the effect of income change on expenditures on durable goods without worrying about a spurious correlation produced by the effect of old age. The table can be read by comparing the proportion in the "more" group between income-change classes and similarly for the "less" group. If the proportion in the "same" group varies considerably between income-change classes, an alternative would be to set up the following fraction as an index

of flexibility: the proportion spending more in the second year over the proportion spending either more or less in the second year.

TABLE 8[1]

SPENDING UNITS OF DIFFERENT INCOME CHANGE GROUPS CLASSIFIED AS TO WHETHER THEY SPENT MORE, LESS, OR THE SAME AMOUNT ON DURABLES IN THE SECOND YEAR AS IN THE FIRST

Spending on Durable Goods in Second Year Compared with First Year	Income Change: Largest Increase to Largest Decrease				
	Much Larger	Somewhat Larger	About the Same	Somewhat Smaller	Much Smaller
More	50%	40%	35%	30%	15%
Same amount including no purchases in both years	30	30	30	30	35
Less	20	30	35	40	50
	100%	100%	100%	100%	100%

Furthermore, the effect of temporary factors stemming from institutional arrangements in the economy may be better eliminated in the reinterview approach than in the one-study approach. Let us consider a period during which federal restrictions on consumer installment credit are much more stringent than is usually the case. Let us assume that in the absence of credit restrictions the following would represent the mean spending on durables for the five income-change groups:

[1] This table is hypothetical as are the three small ones which follow.

Income Change
Largest Increase to Largest Decrease

1	2	3	4	5
$75	$57	$50	$45	$35

However, while the credit restrictions are in effect, the following means are assumed. The author assumes that the restrictions bear more heavily on the people with a decrease in income.

Income Change
Largest Increase to Largest Decrease

1	2	3	4	5
$72	$53	$45	$38	$25

Using the reinterview approach, the following percentages are obtained:

Income Change
Largest Increase to Largest Decrease

	1	2	3	4	5
More in the second year	40%	35%	30%	26%	21%
Same amount	40	40	40	40	40
Less in the second year	20	25	30	34	39
	100%	100%	100%	100%	100%

By comparing income-change group 3 with income-change group 5 in the data of the single study in the absence of credit restrictions, we find that the latter has a mean which is thirty percent lower. If the same comparison is made while the restrictions are in effect, the latter has a mean which is forty-four percent lower. This is

so because the mean of income-change group number five was affected more by the credit restrictions than was the mean of income-change group number three. With the latter data, it seems that there is an acute downward sensitivity of expenditures to decreases in income whereas in reality the credit restrictions are partly responsible for the difference of forty-four percent. If the reinterview approach is used, the misleading impression is avoided. The credit restrictions may have lowered the mean level of expenditures in both years for group five relative to group three but this does not matter in rendering a judgment with respect to downward flexibility. Regardless of the level of expenditures in the first year, the people in group five have the possibility, although not the likelihood, of having the same percentage in the "more" group or the "less" group or the "same" group as the people in any other group. There is still a sum of one hundred percent in group five and a comparison of percentages between groups is relevant but not the absolute level of expenditures.

To summarize: the analysis of reinterview data was preferred for three reasons: (1) for its usefulness in giving a measure of marginal propensity; (2) because of the greater accuracy of the income-change variable; (3) because of the automatic way in which it tends to abstract from some variables.

The Smallness of the Reinterview Sample

There is one great disadvantage in analyzing the reinterview sample used in this chapter: its small size. It consists of six hundred and fifty-five non-farm non-movers[1] who were interviewed

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[1] During any twelve-month period fifteen or more percent of all spending units move. To obtain interviews twelve months apart from these spending units would involve considerable difficulty. It should be noted that the omission of the movers may introduce a bias in the direction of greater inflexibility of saving.

in the early part of 1948 to obtain information concerning 1947 and who were re-interviewed in the early part of 1949 to obtain information concerning 1948. The effective size for analytical purposes is further reduced because cases for which data are not ascertained concerning a variable being studied must also be eliminated. If two-way breaks are made with the data, the cell size is not unreasonably small. However, if a three-way break is made while the number of brackets is six, five, and three, a sample of six hundred and thirty cases will be reduced to cells of an average size of only seven cases. Many of the individual cells, of course, will be below the average size.

Inflexibility of Contractual Saving between Two Years

The first question which was posed at the beginning of this chapter will now be investigated. The question "How flexible is contractual saving?" is a broad one. Eventually the following question will be probed: "Is there a significant relationship between the direction of change in income and the direction of change in contractual saving or its principal component, life insurance premiums? Also, how does the answer compare with the answer to the same question applied to durable goods spending and to total saving (net worth saving)?" First, however, simpler questions will be investigated.

Table 9 is presented to answer the following question: "In general, is contractual saving less flexible than other components in the consumer's budget, namely, total saving and expenditures on durable goods?" Life insurance premiums also are compared. The differences in flexibility vary depending on the population selected. Using the whole population, the differences are very pronounced. While only twenty-five percent of the population was in the same bracket of total saving in the two consecutive years of 1947 and 1948, sixty-five percent were in the same bracket of

TABLE 9

PROPORTION IN SAME BRACKET BOTH IN 1947 AND IN 1948 FOR SELECTED COMPONENTS OF THE CONSUMER'S BUDGET

Component	Percentage in Same Bracket	Number of Cases*
A. Of Total Population		
Total Saving	25.2%	591
Contractual Saving	64.7	618
Life Insurance Premiums	59.6	612
Selected Durables & Cars	42.4	622
B. Excluding Cases of Zero Saving (or Spending) in Both Years		
Total Saving	23.4%	576
Contractual Saving	61.2	562
Life Insurance Premiums	53.4	532
Selected Durables & Cars	8.0	389
C. Including Only Cases of Saving (or Spending) in First Year		
Contractual Saving	64.8%	530
Life Insurance Premiums	56.6	502

*The number of cases shown corresponds to 100%, e.g., in the case of total saving, 25.2% of 591 cases remained in the same bracket. The same is true of Tables 10-16 in this chapter.

The number of cases constituting the base for the computation of percentages is not the same for all components. It varies depending on the number of spending units for which data was not ascertained in the interview.

contractual saving. Forty-two percent were in the same bracket of spending on selected durable goods[1] and automobiles. It may seem

[1] Included are the larger durable goods, e.g., stoves, refrigerators, washers, dryers and the larger pieces of other furniture. Excluded are smaller electric appliances, clothing, jewelry, etc.

surprising that durable goods spending appears to be less flexible than total saving. This is more apparent than real. The upper portion of Table 9 includes zero cases of both years. When these cases are excluded as they are in the middle portion of the table, it is found that the percentage in the same bracket in the case of total saving, contractual saving, and life insurance premiums is not much changed but the inflexibility of durable goods spending is tremendously diminished to a level where only eight percent are in the same bracket in both 1947 and 1948. The inflexibility of contractual saving relative to both total saving and spending on durable goods is thereby increased.

Up to now we have inquired into the degree of inflexibility of contractual saving regardless of whether or not it was positive in the first year. The following question may be asked: "Of those who did save contractually in the first year, how many remained in the same bracket?" By inspecting the bottom section, an answer to this question is obtained. It is clear that it does not make much difference as far as contractual saving is concerned whether we use this latter population or the entire population. Data for those whose total saving was positive in the first year are not presented since there are both negative and positive brackets, whereas in the case of contractual saving, either people save positively or they do not save at all. The percentage of those in the same bracket of durable goods spending is about twelve. This is not shown in the table since it would seem that it does not make a great deal of sense to exclude the zero cases of the first year and to include those of the second year; there is a constant oscillation for the bulk of the population from positive spending on durable goods to zero spending.

It has been found that contractual saving in general does exhibit great relative inflexibility but does this hold within income change groups? The question can be formulated thus: If those with

TABLE 10

PROPORTIONS IN SAME BRACKET IN 1947 AND 1948 IN INCOME CHANGE GROUPS FOR SELECTED COMPONENTS OF THE CONSUMER'S BUDGET

	Percentage in Same Bracket	Number of Cases*
Change in Income of 5% or More		
A. Of Total Population		
Total Saving	25.7%	502
Contractual Saving	64.2	528
Life Insurance Premiums	59.0	522
Selected Durables & Cars	42.6	530
B. Excluding Cases of Zero Saving (or Spending) in Both Years		
Total Saving	23.8%	489
Contractual Saving	60.6	479
Life Insurance Premiums	53.5	459
Selected Durables & Cars	4.4	508
Change in Income of 25% or More		
C. Of Total Population		
Total Saving	24.8%	220
Contractual Saving	64.9	237
Life Insurance Premium	56.7	232
Selected Durables & Cars	45.3	238
D. Excluding Cases of Zero Saving (or Spending) in Both Years		
Total Saving	23.0%	215
Contractual Saving	60.4	210
Life Insurance Premiums	49.8	200
Selected Durables & Cars	3.9	135

*The number of cases refers to the total number in the designated income change group.

stable incomes are eliminated, is the inflexibility demonstrated in Table 9 significantly lessened? Table 10 provides the answer. Those with changes in income of less than five percent are eliminated; those remaining may be described as having a "simple" or "some" change in income. Then our population is reduced to those having a "large" change in income which is defined as a change of twenty-five percent or more. For both those with some change in income and those with a large change in income, the inquiry is the same as it was in Table 9: "How many remain in the same bracket consecutively in 1947 and 1948?" First, the answer to the question at the beginning of this paragraph is conclusively in the affirmative. When the cases of no activity are included (portions A and C of Table 10), the percentages are notably very similar to the corresponding ones in Table 9. This is true both for those with some change in income and those with a large change in income. When the cases of zero saving (or spending) in both years are excluded the same is true for contractual saving, total saving, and life insurance premiums; expenditures on durable goods exhibit even more flexibility than in Table 9. To sum up: the inflexibility of contractual saving relative to other components is maintained when an attempt is made to remove the effect of income change.

Table 11 is presented in answer to the following question: If a comparison is made between those with large changes in income and the rest of the population, is there a significantly greater degree of flexibility of contractual saving for those with large changes in income? Table 11 clearly points to a negative response.

TABLE 11

PROPORTIONS IN SAME AND DIFFERENT BRACKETS OF CONTRACTUAL SAVING IN 1948 COMPARED WITH 1947 RELATED TO LARGE CHANGES IN INCOME

	Change in Income of Less than 25%	Change in Income of 25% or More
A. Of Total Population		
Same Bracket of Contractual Saving	64.6%	64.9%
Different Bracket	35.4	35.1
	100.0%	100.0%
Number of Cases	382	237
B. Excluding Zero Contractual Savers in Both Years		
Same Bracket of Contractual Saving	61.6%	60.4%
Different Bracket	38.4	39.6
	100.0%	100.0%
Number of Cases	352	210
C. Of Those Spending Units Without Contractual Saving in 1947		
Same Bracket of Contractual Saving	65.1%	63.2%
Different Bracket	34.9	36.8
	100.0%	100.0%
Number of Cases	41	47
D. Of Those Spending Units With Contractual Saving in 1947		
Same Bracket of Contractual Saving	64.8%	64.9%
Different Bracket	35.2	35.1
	100.0%	100.0%
Number of Cases	335	195

The Direction of Change in Selected Components of the Consumer's Budget Related to the Direction of Change in Income

Although the inflexibility of contractual saving is not affected by income change, it is possible that the direction of change in contractual saving (and of other components) may be significantly related to the direction of change in income. Since a positive change in income means there is a greater ability to save (or spend) than formerly existed, it is reasonable to suppose that the change in saving (or spending) will be positively correlated to the change in income. Our concern lies in discovering whether or not this relationship is significant. Sometimes mere inspection of a table provides an answer; when the conclusion is in doubt, a statistical test of significance will be applied. The latter is true of Table 12.

Using the data supporting Table 12, "simple" change in income is selected as the independent variable. It is scaled in the following way:

+ 1 if the increase in income is 5% or more,
0 if the change in income is less than 5%,
- 1 if the increase in income is 5% or less.

The dependent variable is the change in contractual saving, life insurance premiums, expenditures on durable goods, or total saving. These are scaled in the following way:

+ 1 if the spending unit moves into a higher bracket,
0 if in the same bracket,
- 1 if the spending unit moves into a lower bracket.

In both Tables 12 and 13 the cases of zero saving (spending) were eliminated to prevent any bias in the direction of inflexibility.

TABLE 12

DIRECTIONS OF CHANGE IN SELECTED COMPONENTS OF CONSUMER'S BUDGET IN 1948 RELATED TO DIRECTION OF SIMPLE CHANGE IN INCOME*

	Simple Change in Income		
	Increase of 5% or more	Income Change of less than 5%	Decrease of 5% or more
Contractual Saving			
More in 1948	21.7%	17.3%	20.6%
Same Bracket	63.3	64.4	55.9
Less in 1948	15.0	18.3	23.5
	100.0%	100.0%	100.0%
Number of Cases	309	83	170
Life Insurance Premiums			
More in 1948	22.9%	16.7%	23.2%
Same Bracket	53.9	53.1	52.7
Less in 1948	23.2	30.2	24.1
	100.0%	100.0%	100.0%
Number of Cases	295	72	165
Durable Goods			
More in 1948	49.0%	47.9%	34.8%
Same Bracket	6.8	14.4	6.8
Less in 1948	44.2	37.7	58.4
	100.0%	100.0%	100.0%
Number of Cases	205	63	122
Total Saving			
More in 1948	41.7%	34.1%	35.2%
Same Bracket	25.8	21.1	20.0
Less in 1948	32.5	44.8	44.8
	100.0%	100.0%	100.0%
Number of Cases	318	88	170

*Population excludes those who did not save (or spend) in both 1947 and 1948.

TABLE 13

DIRECTION OF CHANGE IN SELECTED COMPONENTS OF CONSUMER'S BUDGET IN 1948 RELATED TO DIRECTION OF LARGE CHANGE IN INCOME *

	Large Change in Income		
	Increase of 25% or more	Income Change of less than 25%	Decrease of 25% or more
Contractual Saving			
More in 1948	24.4%	19.3%	20.9%
Same Bracket	62.7	61.6	56.1
Less in 1948	12.9	19.1	23.0
	100.0%	100.0%	100.0%
Number of Cases	138	352	72
Life Insurance Premiums			
More in 1948	31.8%	17.6%	25.1%
Same Bracket	49.0	55.7	51.5
Less in 1948	19.2	26.7	23.4
	100.0%	100.0%	100.0%
Number of Cases	134	332	66
Durable Goods			
More in 1948	58.5%	41.7%	30.5%
Same Bracket	2.9	10.3	5.9
Less in 1948	38.6	48.0	63.9
	100.0%	100.0%	100.0%
Number of Cases	91	254	45
Total Saving			
More in 1948	51.9%	37.2%	20.4%
Same Bracket	22.7	23.6	23.5
Less in 1948	25.4	39.2	56.1
	100.0%	100.0%	100.0%
Number of Cases	141	361	74

*Population excludes those who did not save (or spend) in both 1947 and 1948.

The regression equations follow with the standard error[1] directly below the coefficient of the independent variable.

(1) Change in Contractual Saving = .04929 Change in Y + .01468
(.02948)

(2) Change in Life Insurance Premiums = .00869 Change in Y - .02484
(.03302)

(3) Change in Durable Goods Expenditures = .13339 Change in Y - .06054
(.05432)

(4) Change in Total Saving = .09919 Change in Y - .01898
(.04111)

Social scientists commonly accept a level of significance of ninety-five percent. At this level, to yield significance the coefficient must be twice the sampling error. If this arbitrary level is accepted, the change in both contractual saving and its principal component (life insurance premiums) does not prove to be significantly related to the change in income while both total saving and expenditures on durable goods do show a significant relationship. Notice further that in the case of contractual saving there does not seem to be more flexibility downward than upward.

In Chapter 2, the role of habit in modifying the usual saving hypothesis was stressed as well as the necessity for the subjective realization of new conditions to effect a change in contractual saving. It might be inferred that the new conditions must represent a sharp change. While the independence of the direction of change in contractual saving from the direction of "simple" change in income has been demonstrated, it remains to be seen whether a "large"

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[1] Strictly speaking, this standard error does not apply. Besides the violation of the assumption of normality in the distribution of the variates around the regression line, it is also true that the number of independent observations in a clustered sample (when, e.g., two persons in the same block are interviewed) is not equal to the total number of cases.

TABLE 14

DIRECTION OF CHANGE IN CONTRACTUAL SAVING IN 1948 FOR CONTRACTUAL SAVERS AND NON-CONTRACTUAL SAVERS IN 1947

	Contractual Savers in 1947	Non-Contractual Savers in 1947
More in 1948	16.7%	35.9%
Same Bracket Including Zeros	64.9	64.1
Less in 1948	18.4	0.0
	100.0%	100.0%
Number of Cases	531	94

change in income (twenty-five percent or more) will have a significant impact. To furnish an answer, Table 13 and the accompanying regression analyses were prepared:

(1) Change in Contractual Saving = .07715 Change in Y + .01836 (.04370)

(2) Change in Life Insurance Premiums = .09091 Change in Y - .06568 (.04919)

Surprisingly enough, the correlation between neither the change in contractual saving nor life insurance premiums and the change in income proved to be significant. Mere inspection of the table indicates a contrary answer in the case of both total saving and expenditures on durable goods. Notice again that in the case of contractual saving there is no more flexibility downward than upward.

The Flexibility of Contractual Saving on the Part of Non-Contractual Savers of the First Year

Next, there will be an investigation of how the absence of contractual saving in the first year affects its flexibility.

Conceivably, the people who do not save contractually in the first year may simply be non-contractual savers permanently. However, the opposite hypothesis is more reasonable. Unless the non-contractual savers consist predominantly of the very old and/or the very young, they do have a need for contractual saving (or, at least, for life insurance). The ability to save contractually cannot be completely lacking since the most common contractual commitment (life insurance) typically absorbs only a small fraction of income. Finally, the most basic condition is an awareness of a state of being underinsured. For a certain portion of the population, every year this awareness materializes in a positive act to meet the underlying need. Since the marginal need is greater for those who presently are not saving contractually than for those who are, it is reasonable to expect a greater upward flexibility for the former than for the latter. Table 14 bears out this hypothesis.

The Effect of Age on the Flexibility of Contractual Saving

Before delving into the question of the effect of age on the flexibility of contractual saving, let us become acquainted with the author's framework of reference. In attempting to gain some insight into human behavior in micro-economic analysis, several types of factors may be relevant:

1. Economic, e.g., income, liquid assets;
2. Attitudinal, e.g., expected income;
3. Demographic, e.g., age, race;
4. Factors of relevance which could be made available through survey methods but which are not, e.g., acceptance of new employment covered by a private retirement plan or reason for suddenly deciding to buy a home rather than to rent;
5. Factors of relevance which cannot be accurately made available through survey methods, e.g., (a) when the data is of a personal character which the respondent would prefer to keep secret or give inaccurate answers,

or (b) when the proper conclusion depends not on what did happen but on what would have happened in the absence of certain conditions. It would be possible to find certain periods in which the undertaking of mortgages increased in the face of rising interest rates. In such periods, it would be difficult to obtain a precise estimate of what the volume of new mortgages would have been in the absence of a rise in the interest rate or in the event of a fall.

6. Pure randomness which exists because people are not chemical substances subject to precise laws. (This does not deny that generalizations are possible in the social sciences.)

It is not, as was indicated earlier in this chapter, the purpose of the author to demonstrate the flexibility of contractual saving, to show its similarity to other components in the consumer's budget, and to explain its flexibility. Rather it has been his purpose to demonstrate the relative inflexibility of contractual saving as a prelude to an investigation into the characteristics of contractual savers which is the task of the following chapters. However, let us venture an opinion as to the direction which a study concerned with the flexibility of contractual saving could take. Economic factors do not seem to be important. At least this is so of income change—in spite of the fact, as we shall see subsequently, income is of prime importance in explaining the level of contractual saving. Since an actual income change of twenty-five percent or more is insignificant in explaining either change or direction of change in contractual saving, it is highly unlikely that attitudinal factors such as expectations and perception of economic conditions are important. Of the factors which are available in the reinterview surveys, this leaves demographic factors such as age. To gain some insight into the importance of the latter, Table 15 and Table 16 are presented.

Table 15 shows that upward flexibility, in addition to being a function of whether people saved contractually in the first year, as Table 14 indicated, is also a function of age. Since contractual

TABLE 15

UPWARD FLEXIBILITY OF CONTRACTUAL SAVING AMONG AGE GROUPS—CONTRACTUAL SAVERS IN 1947 AND NON-CONTRACTUAL SAVERS

	Age					
	18-24	25-34	35-44	45-54	55-64	65 or over
Non-Contractual Savers in 1947						
More in 1948	52.6%	40.0%	50.0%	40.0%	25.9%	18.8%
Same Bracket	47.4	60.0	50.0	60.0	74.1	71.2
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number of Cases	7	11	11	23	10	32
Contractual Savers in 1947						
More in 1948	12.3%	21.0%	33.7%	23.2%	4.4%	4.5%
Same Bracket	87.7	79.0	66.3	76.8	95.6	95.5
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number of Cases	22	94	118	97	69	34

saving consists of long-term commitments which are needed in middle age, mainly because of the responsibility for wife and children, it is to be expected that new saving commitments will appear more frequently among the young and middle-aged than among the old.

Although low relatively, there is still considerable upward flexibility among those between 55 and 64 (26%) and among those 65 or over (19%). Certainly the need for the protection of life insurance diminishes with age. Perception of the need for saving, however, may be a different matter. Although people need to save to provide for their old age all through life, shortsightedness in early life is likely to give way to acuity of perception increasing with age.

At the age of thirty or thirty-five, the age of seventy seems astronomically beyond reach. However, at fifty-five, the prospect of years of retirement in which social security benefits will be insufficient to maintain the customary plane of living provides an additional incentive for saving. At the latter age, the appeal of saving in the form of life insurance may be powerful to someone lacking sufficient strength of character to save discretionally.

There are probably other factors which contribute to the upward flexibility among those of fifty-five or over: (1) life insurance agents have never been known to concentrate their efforts on the young exclusively, and (2) the growth of group insurance together with the absence of the requirement of a physical examination and the semi-compulsion that sometimes accompanies it. That solicitation has something to do with the purchases of life insurance is self-evident. Participation in group insurance may be voluntary in theory but compulsory in fact. The author discovered this while an employee of the General Motors Corporation. At the time he was single and entirely without dependents. Neither was he contemplating marriage in the near future. His need was negligible; his desire, non-existent. Nevertheless, to his chagrin, he was told by the office supervisor on the first day of his employment: "We don't want any of our employees dying without insurance. You had better fill out this application form." Every employee in this office subscribed to group life insurance (and bought war bonds at the rate of ten percent of gross income) not merely because of solicitation but rather, more accurately, because of coercion. The amount of protection each employee received depended not on the number of dependents he had but entirely on his wage income. Given the amount of protection, the premiums paid increased with age. This case is cited to point out the complexity of explaining the level or the change in life insurance premiums, the chief component of contractual saving.

TABLE 16

PROPORTIONS IN SAME AND DIFFERENT BRACKETS OF CONTRACTUAL SAVING IN 1948 COMPARED WITH 1947 RELATED TO AGE GROUPS

	Age		
	18-34	35-54	55 or over
Same Bracket*	65.6%	53.7%	69.9%
Different Bracket	34.4	46.3	30.1
	100.0%	100.0%	100.0%
Number of Cases	144	288	142

	Age				
	Less than 35	35-44	45-54	55-64	65 or over
More in 1948	19.4%	29.5%	22.3%	8.6%	9.6%
Same Bracket	61.3	49.6	51.1	72.1	39.4
None Both Years	6.6	3.4	9.1	7.4	31.7
Less in 1948	12.7	17.5	17.5	11.9	19.3
	100.0%	100.0%	100.0%	100.0%	100.0%
Number of Cases	154	157	149	92	82

* The cases of zero contractual saving in both years were excluded in preparing the upper portion of this table.

The portion of Table 15 referring to those who did save contractually in 1947, which is remarkably different from the other portion, has favorable welfare implications. Only a small portion of the very young increase their contractual saving because a high percentage of them are single or already have made commitments—even perhaps in excess of their needs. The old who already have sizeable amounts of savings in the form of life insurance apparently feel that they do not need more; neither are they likely to be making new mortgage commitments. There is a concentration of upward flexibility in the age groups from twenty-five to fifty-four (especially thirty-five to forty-four). This suggests an awareness of a

need for more contractual saving, most likely an awareness of being underinsured, and positive action to alleviate the situation.

Table 16 examines in its upper portion the general flexibility of contractual saving within broad age groups. A more detailed picture is presented in the lower portion of the table which shows more age groups, both upward and downward flexibility, and also includes the cases of zero contractual saving in both 1947 and 1948 which were excluded in the upper portion.

Referring to the upper portion first, it is found that the age group 35-54 has more flexibility in general and not merely more upward flexibility. When the group 18-34 is combined with the group 55 or over (treated as zeros) and compared with the middle-aged group (treated as ones) in a simple regression analysis, the following significant result appears:

$$\text{Change in Contractual Saving} = \underset{(.04049)}{.13961}\ \text{Age} + .32364$$

With this determined, a more meaningful picture can be gotten from the details of the lower portion of Table 16. Although Table 16 in part overlaps Table 15, it tells, in addition, the effect of age on those who have no contractual saving in both 1947 and 1948 and it indicates relative downward flexibility within age groups. The first question reveals more about the effect of age on the level of contractual saving rather than about its change. One would expect the retired—who are mainly sixty-five or over—to be without contractual saving significantly more frequently than younger members of the population. Typically, they would hardly be paying for a home. Neither would they be earning wage income subject to retirement fund deductions. If they are single, a widow, a widower, they would have no need for life insurance, other than for purposes to save, since their children are likely to be grown and financially independent. Table 16 supports this.

Since over three-quarters of the population make life insurance payments, and since the need on the part of the old is not great, one would expect a higher percentage of those over sixty-five to be in the "less" group than is true of any other age group. The facts again support this.

As mentioned previously, Table 16 reveals that there is greater downward flexibility for age groups 35-44 and 45-54 than for those less than thirty-five or those between fifty-five and sixty-four. Possible explanations follow. (1) When the head of the spending unit is in the age group 45-54, some or all of his children will become financially self-sufficient. (2) Wealth is a substitute for life insurance; as age increases, so does wealth. This factor is relevant in explaining only the greater flexibility between ages 35-54 relative to those in the age group of less than thirty-five. (3) Before the age of fifty-five, many mortgages become fully paid and consequently, the mortgage component of contractual saving declines.

Useful Data for Analyzing Flexibility in Contractual Saving

If one were concerned with the problem of explaining the flexibility of contractual saving, it would be useful to have considerable data much of which does not exist. To analyze some aspects of the long-term in contractual saving, a reinterview study encompassing more than two years would be helpful. As far as the two-year reinterview study is concerned, it would seem that there should be a list of questions to discover whether the respondent was subject within the last year to a major change in life which reorganized his perceptive field, his budget, or both. Contractual commitments are ordinarily thought of as being long-term. However, this long-term nature is merely relative and subject to

fluidity under the impact of a severe economic or psychological shock. The following list is intended to be representative but not complete.

1. Were you released from military service within the last year?
2. Did you become separated or divorced?
3. Did you become fully employed after graduating from college? Did you complete your graduate school education?
4. Did you move? Into a larger apartment or home? (Moving would affect not merely housing expenses directly but may very well cause sizeable purchases of durables and a re-appraisal of one's entire budget.)
5. (of manual workers) Did you complete your period of apprenticeship in your occupation? (This is more than merely an income change effect. More optimism and a feeling of security is likely to be engendered, which would probably increase the readiness to undertake fixed commitments.)
6. Did you become aware of occupational failure, i.e., did something happen to you such as being fired from a position in an occupation in which you previously considered yourself to be a success? (These are attitudinal questions but not of the short-term variety.)

Answers to the following questions may shed light on the change in the payment of life insurance premiums.

1. Have you changed your place of employment?
2. Do you carry group insurance where you work?
3. Did you carry group insurance at your former place of employment?
4. Did you marry within the last year?
5. Did your wife make life insurance payments before marriage which she is still making?
6. Did your wife return to work? (Many women return to work in the age group of forty to fifty after having reared their children. Life insurance premiums may rise in spite of declining need for protection because of the attraction of inexpensive group insurance.)
7. Did your wife become pregnant during the last year? Was she previously working? (If the answer to both of these questions is in the affirmative, the need for more life insurance protection is tremendously increased.)

8. Within the last year, did you decide to send your children to college?

9. Within the last year, did any of your children become financially independent?

10. Were you approached by a life insurance agent this year?

Attempting to design a set of questions for a two-year reinterview sample which would cast some light on the question of why mortgage principal payments change from one year to the next is extremely difficult. The changes which do occur are of several types:

1. Increases because someone has decided to buy a home.
2. Decreases because someone has decided to sell a home.
3. Automatic increases in mortgage principal payments while the mortgage contract remains unchanged. Today the large majority of mortgages are of the level payment type. Since the mortgage debt is a maximum at the inception of the contract and zero at its termination, it follows that interest payments absorb the bulk of the payment in the early life of the contract and only a small portion in the late stages while the principal payments then loom large.
4. Sudden large repayments of principal presumably because the mortgagor has reorganized his finances (e.g., has sold stock or cashed government bonds) or because of a windfall.
5. Renegotiating an old mortgage because one finds he wishes to increase his debt to finance improvements or an addition to his home or because he finds himself in straitened circumstances temporarily.

Several conditions must be satisfied before the major decision to buy a home is reached.

1. Perhaps most fundamental from an economic standpoint, the buyer must have saved over a period of years an amount sufficient to meet the down payment requirement. Of the necessary conditions, this is the one most likely to require more than a year's effort. Therefore, in a two-year reinterview, it is not likely that one will find in the second year a condition differing sharply from that of the first.
2. A house of the type wanted must be available in the desired neighborhood. This condition frequently was not satisfied in the four or five years immediately following World War II.
3. Compatibility with the indivisibility in home size. In mind is the spinster or bachelor who has the down payment but who needs only two rooms and does not want to share a house but the

homes available are all of a bigger size.

4. The potential buyer must decide that it is wiser (not necessarily less expensive) to own rather than to rent. Non-monetary as well as monetary factors must be weighed. Greater personal freedom and security are invaluable benefits of home ownership. Offsetting factors are greater responsibility and inflexibility.

5. A home must be available at an acceptable price. The prospective buyer may be waiting to snatch a bargain from a seller who is in ready need of cash or the buyer may be waiting for a change in general market conditions. In the post-war period, there was among some people a sharp awareness of the recent rise in real estate prices while memory of the great decline in real estate prices in the 1930's was still keen. Some prospective buyers engaged in wishful thinking while futilely postponing purchases until their resistance was finally broken and they paid the penalty for their indecision in the form of still higher prices.

Probably the following factors are related to the selling of a home.

1. Overcommitting oneself financially. Rather than being due to an income decline, this can be associated with increasing demands on one's income.

2. Diminution in the quantity of housing needed.

The reasons for changes in retirement fund payments seem to be much simpler than those for changes in mortgage payments. The principal condition for making such payments would seem to be the opportunity for doing so. Usually the retirement plans are set up so that the employer supplements the payments of the employee to the extent that the schemes are hard to resist except for those who are temporarily employed or who urgently need their full income. However, retirement fund payments are a small part of total contractual saving at the time for which microeconomic data are available; therefore, analysis must be limited mainly to life insurance payments and mortgage payments.

The foregoing discussion, while not complete, should be sufficient to indicate that it is very doubtful whether the 1947-48 reinterview study of the Survey Research Center (which is the only

one which made available changes in contractual saving) is an ideal instrument for capturing the characteristics of people who change the amount of their contractual saving. (1) This is partly because the demographic characteristics of people, e.g., marital status, race, education, occupation, etc., which are so frequently used as independent variables in microeconomic analysis, do not change at all or change very little between two years or change for only a small portion of the population.[1] There is the basic problem that the need for life insurance and for housing changes slowly over the life cycle whereas in a single interview only a "snapshot" of the process of gradual change can be taken. This snapshot is not a satisfactory substitute for the required moving picture. (2) The incompleteness of available data concerning factors producing severe economic or psychological shock as well as the desirability of more useful data for analyzing changes in life insurance payments has previously been mentioned. (3) Variations in principal payments on mortgages are partly automatic and partly the result of highly individual decisions which, possibly, are not closely connected with the characteristics of the group to which the payer may belong.

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[1] This does not necessarily mean that there cannot be a significant relationship between a demographic variable and a change in some other variable over two years. Although age changes little between two years, it has been shown that it is related to a change in contractual saving. After the age of sixty-five, the downward flexibility of contractual saving is so sharp that even a one-year change in age is important.

B. Discretionary Saving Behavior of Contractual and Non-Contractual Savers

Technique and Definitions

In part "A" of this chapter, a study has been made of the inflexibility of contractual saving between two consecutive years. In part "B" a comparison of the saving behavior of contractual and non-contractual savers will be made while using the data of a single year. The technique will be one (1) of fitting linear regressions and (2) of testing the equations obtained with the analysis of covariance. In analysis of covariance, two estimates of the unexplained variance are made: (1) one by adding the unexplained variance of the individual groups in separated form and adjusting by the appropriate number of degrees of freedom: (2) the other by pooling moments and making a separate estimate based on the pooled data. The question raised is: Is more of the existing variance explained by making one regression estimate of the pooled data than is explained by separate regression estimates by using subgroups of the population? Whether separation makes a significant difference is judged by utilizing the F test. The numerator of the F ratio is the contribution of separation to the explained variance and the denominator is the total unexplained variance in separated form.

Our interest lies in the following functions: (a) total saving related to total income for those who do not save contractually, (b) total saving related to total income for those who do save contractually, (c) discretionary saving related to discretionary income for those who do save contractually, and (d) discretionary saving related to discretionary income for those who do not save contractually. The same magnitude will be subtracted in arriving at both discretionary saving and discretionary income: discretionary saving will be defined as total (net worth) saving minus

contractual saving; discretionary income will be defined as total income minus contractual saving. Later the concept of discretionary income will be modified by subtracting income taxes as well. Since, for non-contractual savers, discretionary saving equals total saving and discretionary income equals total income, functions (a) and (d) above are the same.

The Hypotheses

The analysis was performed with the following hypotheses in mind. (1) Total saving is likely to be higher for the contractual savers than for the non-contractual savers. (2) Contractual savers and non-contractual savers are likely to be similar in their discretionary saving behavior. The logic underlying these hypotheses is quite contrary to Keynesian ideas of "oversaving".[1] It would be a strange world indeed if people could not find ways of spending their income. In this world of unsatisfied wants in the presence of luxurious living by others, ubiquitous advertising, conspicuous consumption, larger families, and easy credit, the pressure for dissaving is great. It seems that for many people, discretionary saving is a task which requires more strength of character than they can muster. For persons of this stripe, it seems likely that given income, those who have made contractual commitments to save will be more successful in their total saving behavior than those who have not. These commitments to save may be like fixed costs in the short run in the theory of the firm. If such should be the case, i.e., if they should be "water over the dam" in discretionary behavior, the second hypothesis mentioned above would be reasonable.

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[1] Admittedly, the Keynesian idea was relative. Perhaps, "underinvestment" would be a more accurate expression of his thought.

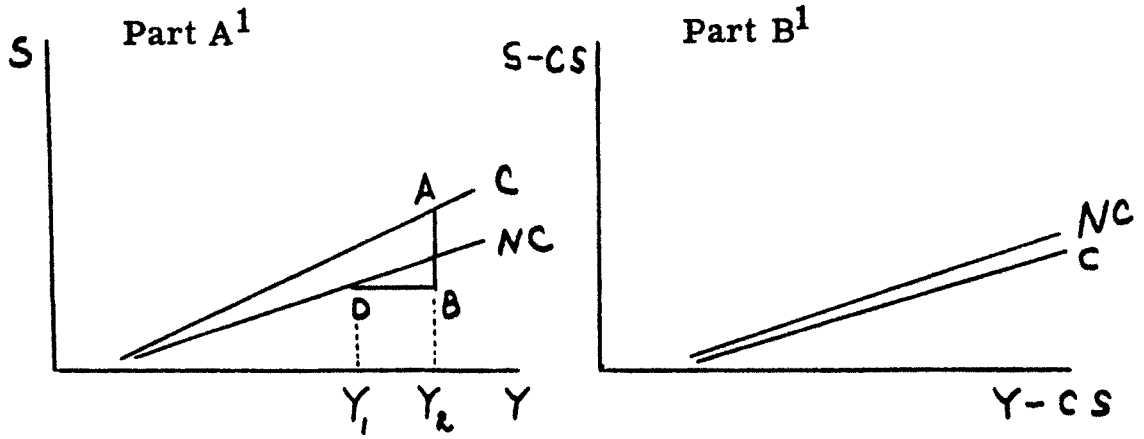


Figure 1. Hypothetical Saving Functions

The first hypothesis is represented in Part A of Figure 1 and the second in Parts B and A. Saving (or discretionary saving) is the variable along the vertical axis and income (or discretionary income) is the variable along the horizontal axis. While the total saving function for contractual savers in Part A is presumed to be considerably above the function for non-contractual savers at most income levels the discretionary saving function in Part B is not. It may coincide or may be insignificantly lower. In Part A, the distance AB equals the distance DB and is representative of the volume of contractual saving at Y_2; a contractual saver with an income of Y_2 presumably would save in a discretionary way like a non-contractual saver with an income of Y_1. First, the relationships will be tested by using the data of the Survey of Consumer Finances of early 1949 based on data pertaining to the year 1948. Then, the stability of the relationships will be tested employing the data of the Survey of Consumer Finances of 1950 based on

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[1] CS is used as an abbreviation for contractual saving.
S is used as an abbreviation for total saving.
Y is used as an abbreviation for total income.
C is a function for contractual savers.
NC is a function for non-contractual savers.

1949 information.

The Analytical Relationships and Conclusions

We have previously explained our technique in the first section of part B of this chapter.[1] Now we present the functions[2] obtained from the analysis of the 1948 data.[3]

Non-Contractual savers:

(a) $S = .11206\ Y - \$271.15$

Contractual savers:

(b) $S = .30370\ Y - \$1175.51$

(c) $S - CS = .09458(Y - CS) - \$151.26$

The results confirmed anticipations. Tables 17 and 18 unquestionably indicate that significantly more variance can be explained by separating savers into those who do save contractually and those who do not save contractually, but that separation of discretionary savers into those who do save contractually and those who do not

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[1] It is difficult—in some cases, well nigh impossible to reach a reliable conclusion as to whether there is a significant difference between coefficients by mere inspection. Non-contractual savers may be low-income people more so than contractual savers. By mere inspection of the coefficients of the two groups, there may appear to be a significant difference. Covariance treatment, in effect, puts the two sets of data on top of each other with the intersection of the axes representing the means of the variables. When this is done, there may prove to be no significant difference.

[2] In all of the saving (or discretionary saving) functions presented in this section the relationship to income (or discretionary income) is significant.

Before proceeding, we assured ourselves that contractual saving was significantly related to income:

$$CS = \underset{(.00144)}{.03125\ Y} + .16$$

[3] Farmers were excluded.

save contractually does not help in explaining significantly more variance.

TABLE 17

SAVING AND INCOME, 1948, CONTRACTUAL AND NON-CONTRACTUAL SAVERS, CONTRIBUTION OF SEPARATION

	Sums of Squares	d. f.	Variance
Pooled data, one estimate	60,765,804	2890	
Unpooled data, two estimates	59,921,761	2889	2,074
Contribution of separation	844,043	1	844,043

$F^1 = 407.1$ $n_1 = 1$ $n_2 = 2889$

(F = 10.8 is required for the .001 level of significance)

TABLE 18

DISCRETIONARY SAVING AND DISCRETIONARY INCOME, 1948, CONTRACTUAL AND NON-CONTRACTUAL SAVERS, CONTRIBUTION OF SEPARATION

	Sums of Squares	d. f.	Variance
Pooled data, one estimate	2,657,237,677	2890	
Unpooled data, two estimates	2,656 328,531	2889	919,463
Contribution of separation	909,146	1	909,146

$F = 0.98$ $n_1 = 1$ $n_2 = 2889$

(F = 3.841 is required for the .05 level of significance)

[1] This F and those in subsequent tables are not absolutely precise because the number of degrees of freedom in a clustered sample is less than the number there would be on the assumption that all observations are independent.

To test the stability of these striking relationships, similar ones were also computed from the data of the following year, 1949.

Non-contractual savers:

(a) $S = .07461\ DY - \$263.39$

Contractual savers:

(b) $S = .20926\ DY - \$502.40$

(c) $S - CS = .06953(DY - CS) - \$179.88$

Contractual saving was deducted from disposable income (DY) instead of from total income in an attempt to improve the concept of discretionary income, although it was not expected that this deduction would make a great deal of difference. Businessmen as well as farmers were deleted because their motivation for saving may be geared to opportunities for profitable investment in their own businesses. It was thought desirable to obtain a sample which was truly "consumer" in character, uncolored by business motivation. When the businessmen are eliminated (the farmers were not included in the analysis of the 1948 data), the marginal propensity to save becomes smaller, thus implying that the businessmen are more sensitive to income as a function of saving than is the rest of the population. The functions did prove to be reasonably stable although in this case they were less steep partly for the reason just mentioned. Perhaps it would be more accurate to say that, again, as Tables 19 and 20 indicate, significantly more variance can be explained by separating savers into those who do save contractually and those who do not save contractually but that separation of discretionary savers into those who do save contractually and those who do not save contractually does not account for significantly more variance. Therefore it is safe to conclude (1) that those who do save contractually are more sensitive to income in

TABLE 19

SAVING AND INCOME, 1949, CONTRACTUAL AND NON-CONTRACTUAL SAVERS, CONTRIBUTION OF SEPARATION

	Sums of Squares	d. f.	Variance
Pooled data	727,128,328	2674	
Unpooled data	703,123,697	2673	263,046
Contribution of separation	24,004,631	1	24,004,631

$F = 91.6$ $n_1 = 1$ $n_2 = 2673$

($F = 10.8$ is required for the .001 level of significance)

TABLE 20

DISCRETIONARY SAVING AND DISCRETIONARY INCOME, 1949, CONTRACTUAL AND NON-CONTRACTUAL SAVERS, CONTRIBUTION OF SEPARATION

	Sums of Squares	d. f.	Variance
Pooled data	940,637,326	2674	
Unpooled data	940,603,520	2673	351,890
Contribution of separation	33,806	1	33,806

$F = 0.09$ $n_1 = 1$ $n_2 = 2673$

($F = 3.84$ is required for the .05 level of significance)

their total saving behavior than those who do not save contractually; and that (2) there is no significant difference between the discretionary saving behavior of contractual savers and non-contractual savers in response to discretionary income.

It is useful to make an inference as to the effect of contractual saving on the level of aggregate saving. Is contractual saving merely a substitute for discretionary saving with no effect on the level of aggregate saving or does it represent in part an

addition to the level of aggregate saving which would take place in the absence of contractual saving? Perhaps no indisputable answer to this question can be gotten but it seems highly likely that the latter is true. If the 1949 total saving function in equation (a) for non-contractual savers is compared with the total saving function in equation (b), it is found that the saving axis intercept for the contractual savers is lower than that of the non-contractual savers. This complication means that it cannot be said that at all levels of disposable income the non-contractual savers save less (or dis-save more) than the contractual savers.[1] At disposable income levels below $1,700 they do not; whereas, at income levels above $1,700 they do. Furthermore, the hypothesis underlying Part A of Figure 1 has been shown to be correct. If a spending unit with a disposable income of Y_2 saves in a discretionary fashion like a spending unit with a disposable income of Y_1, it follows that he saves more in terms of aggregate saving than a non-contractual saver with a disposable income of Y_2 since the slope of the saving function for non-contractual savers between point A and point D is not equal to one and the functions for contractual savers and non-contractual savers do not intersect at point D. This is true throughout most of the income scale. It seems safe to conclude, therefore, that contractual saving and non-contractual saving are not perfect substitutes; contractual saving is additive to non-contractual saving at least in part.

The Concept of Discretionary Income Discussed and Supported

There follows, as a sideline, a brief consideration of our concept of discretionary income.[2] A priori, what is a proper

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[1] It also means some people save contractually in the face of net dissaving.

[2] Defined as total income minus contractual saving and income taxes.

concept of discretionary income for our purposes is extremely fuzzy. It can be argued that for homeowners, property taxes and property insurance should be deducted; also, that for non-homeowners, rent should be deducted. However, what are counterparts in providing housing services may not necessarily be counterparts in the motivation of savers. No matter what one does deduct, a case might be made for deducting something else. The author was restricted both by (1) the limitations of available data, and (2) the expense of the necessary machine work. Because of the extreme fuzziness of the concept of discretionary income, the author does not claim that the analysis of his second hypothesis is definitive. Undoubtedly, further work could be done in this area by experimenting with other concepts of discretionary income. The proportion of a consumer's budget which is discretionary would seem to shrink as the period under consideration is shortened.

Two additional pieces of analysis were performed to cast some light on the effect of home ownership on the validity of the author's hypotheses. (1) Using the data of 1949, the following relationships were computed for non-homeowners.

Non-contractual savers:

$$S = .05348\ DY - \$225.35$$

Contractual savers:

$$S - CS = .03384\ (DY - CS) - \$236.80$$

Table 21 demonstrates that separation of the non-homeowners into those who do save contractually and those who do not save contractually does not result in the explanation of significantly more variance. In other words, non-homeowners with contractual saving behave in the same way with respect to discretionary saving as do non-homeowners without contractual saving. This seems to be a happy finding. It lends support to the author's concept of

TABLE 21

DISCRETIONARY SAVING AND DISCRETIONARY INCOME, 1949, NON-HOMEOWNING CONTRACTUAL AND NON-CONTRACTUAL SAVERS, CONTRIBUTION OF SEPARATION

	Sums of Squares	d. f.	Variance
Pooled data	742,484,226	1502	
Unpooled data	742,263,073	1501	494,512
Contribution of separation	221,153	1	221,152

$F = 0.45$ $n_1 = 1$ $n_2 = 1501$

($F = 3.84$ is required for the .05 level of significance)

discretionary income and implies that people do not look upon mortgage payments and rent as being similar. At any rate, they do not affect discretionary saving behavior in the same way. If they did, one could argue that separation of the aggregate of non-homeowners into contractual savers and non-contractual savers would make a significant difference.

(2) Now follows the second piece of supplementary analysis. Thus far, mortgage payments have been treated as saving and as a deduction from disposable income in arriving at the concept of discretionary income. If rent were a counterpart of mortgage payments, then presumably, rent should be deducted in arriving at the residual called discretionary income. At any rate, rent and mortgage payments conceivably can be treated in a similar fashion. Computationally, it was difficult to treat rent as a deduction from disposable income. However, there was still an avenue of approach whereby there could be similarity of treatment, viz., to treat mortgage payments as consumption; or to state it

alternatively, not to deduct contractual saving from disposable income. In other words, to set up a new equation: $S - CS = aDY + b$. Now contractual saving of which mortgage payments are a large component are treated similarly to rent on the income side of the equation, i.e., they are not deducted. Using the population of homeowners and non-homeowners, the following equations and the covariance analysis, shown in Table 22, were obtained:

Non-contractual savers:

$S = .07461\ DY - \$263.39$

Contractual savers:[1]

$S - CS = .11412\ DY - \$418.21$

TABLE 22

DISCRETIONARY SAVING AND TOTAL DISPOSABLE INCOME, 1949, NON-CONTRACTUAL AND CONTRACTUAL SAVERS, CONTRIBUTION OF SEPARATION

	Sums of Squares	d. f.	Variance
Pooled data	822,314,602	2674	
Unpooled data	820,248,498	2673	306,864
Contribution of separation	2,066,104	1	2,066,104

$F = 6.73$ $n_1 = 1$ $n_2 = 2673$

($F = 6.64$ is required for the .01 level of significance)

[1]That the slope of this function is steeper than the slope of the similar one for non-contractual savers is surprising. Relating discretionary saving to discretionary income, it was found that there was no significant difference between the behavior of (1) contractual and (2) non-contractual savers. Relating discretionary saving to total disposable income, it was found that there was a significant difference between the behavior of (3) contractual and (4) non-contractual savers. The difference between functions (1) and (3) lies in the fact that for a given level of discretionary saving, the horizontal measurement is greater in function (3). Therefore,

Separation did make a significant difference. In summary then, with respect to a discretionary saving behavior, contractual savers and non-contractual savers behave alike when rent and mortgage payments are treated dissimilarly; they do not behave alike when they are treated similarly. The supplementary findings have supported the author's original concept of discretionary income.

The last two functions which were computed can be used to further test whether contractual saving and discretionary saving are substitutes. It was found that although the saving axis intercept for the contractual savers is lower than for non-contractual savers, the level of discretionary saving for the contractual savers exceeds that of the non-contractual savers at a disposable income level of $4,000 and above. This is because the marginal propensity to save in a discretionary fashion for the contractual savers is higher than for the non-contractual savers. It seems safe to conclude, once more, that contractual saving and discretionary saving are not substitutes.

In connection with these findings, the author might briefly allude to the theories of saving recently advanced by (1) Franco Modigliani and Richard E. Brumberg,[1] and (2) Milton Friedman[2]

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a priori it is reasonable to expect function (3) to have a flatter slope than function (1), and hence than function (4), since (4) is identical with (2) and there is no significant difference between (2) and (1). However, this did not prove to be the case.

[1] F. Modigliani and R. E. Brumberg, "Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data," Post-Keynesian Economics, ed. by K. Kurihara (New Brunswick: Rutgers University Press, 1954), pp. 388 ff.

[2] M. Friedman, "A Theory of the Consumption Function" (Mimeographed) (New York: National Bureau of Economic Research, 1955).

without presenting them in detail.[1] In Modigliani's and Brumberg's theory, the individual is conceived as continuously planning his consumption pattern for the remainder of his lifetime. Our findings support a similar theory of long-term planning not with respect to the consumption side of the budget but with respect to the saving side. These findings may deserve attention in influencing the theory of saving. In the Modigliani and Brumberg theory, saving remains positive throughout the working life to permit the accumulation of sufficient assets to maintain the previous level of consumption throughout retirement. Among other things, an important feature of the theory is the fact that "total resources" including all expected future incomes play a part in the analysis, whereas much work, both empirical and theoretical, has stressed the role of current income only. The insignificance of income change in relation to the change in contractual saving, which the author has found, suggests likewise that an income concept related to a period of long duration is important in determining some parts of saving.

Friedman divides consumption into a permanent component and a transitory component. He does not define these components in a hard and fast way. Faced with uncertainty individuals hold assets and Friedman assumes the crucial factor to consider is the asset/permanent income ratio. The higher this ratio, the greater consumption becomes. Again, the level of current observed income has no direct influence on consumption patterns. It does influence behavior insofar as it is an adequate indicator of permanent income.

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[1] Malcolm R. Fisher has submitted these theories to testing within the limits of available statistical material. See his "Exploration in Savings Behaviour," Bulletin of the Oxford University Institute of Statistics, XVIII (August, 1956), pp. 201-263.

C. Summary

The purpose of this chapter has been twofold, viz., to investigate mainly the following questions: (1) How does contractual saving respond to income change in comparison with other components in the consumer's budget? and (2) Are contractual savers and non-contractual savers similar in their discretionary saving behavior? The latter question was investigated to gain some insight into the question of whether contractual saving and discretionary saving are substitutes. Alternative techniques for investigating the first question and the reasons for preferring the data of a reinterview study over those of a one-year study were explained.

It was found that between two years, contractual saving does exhibit great relative inflexibility both irrespective of income change groups and within income change groups. Furthermore, it was discovered that there is not a significantly greater degree of flexibility of contractual saving for those with large changes in income (changes of twenty-five per cent or more). Next, the relationship between the direction of change in contractual saving (and of other components) and the direction of change in income was studied. Whether "simple" change in income (a change of five per cent or more) or large change in income is taken as the independent variable, both contractual saving and its principal component (life insurance premiums) do not prove to be significantly related to the change in income while both total saving and expenditures on durable goods do show a significant relationship. Upward flexibility of contractual saving in the second year proves to be related to the absence of contractual saving in the first year.

There are both more upward flexibility and downward flexibility for those in the middle age groups than for those in the

extreme age groups. The general problem of studying the flexibility of contractual saving and the weaknesses of the 1947-1948 reinterview study in relation thereto were considered.

The second major part of the chapter was concerned with the question of whether contractual saving and discretionary saving are substitutes. Whether we used the data of 1948 or of 1949, we found that significantly more variance can be explained by separating savers into those who do save contractually and those who do not save contractually but that separation of discretionary savers in the same fashion does not help in explaining significantly more variance. An inference was drawn to the effect that contractual saving and non-contractual saving are far from perfect substitutes; rather contractual saving is additive to non-contractual saving at least in part. Finally, the author's concept of discretionary income was supported by two additional pieces of analysis: (1) Separation of non-homeowners into those who do save contractually and those who do not save contractually does not result in the explanation of significantly more variance. (2) With respect to discretionary saving behavior, contractual savers and non-contractual savers do not behave alike when rent and mortgage payments are treated similarly.

CHAPTER IV

FACTORS INFLUENCING CONTRACTUAL SAVING

A. Theoretical Considerations

Introduction

The object of the remainder of this dissertation is to search for the characteristics of people that contribute to a determination of the level of contractual saving. Since the determining factors may change over time in their distribution over the population, they are relevant in influencing, at least, the long-term level of contractual saving.

There are several difficulties in making this study in a truly scientific way.[1] First of all, the general body of economic theory is not particularly helpful in providing guiding hypotheses. There is no theory of contractual saving as such. Most hypothesizing which has been done in the field of saving pertains to aggregate personal saving. The latter need not apply to contractual saving. We have already shown that, in general, contractual saving and discretionary saving are not substitutes. There is no reason why they should be substitutes as they relate to sub-groups of the population with particular characteristics. A particular case can be cited as an example. There is a

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[1] By "scientific" is here meant "proceeding from hypotheses" rather than fishing in an exploratory way.

tendency for people in the years shortly preceding retirement to increase their rate of aggregate saving. There is no reason, however, for contractual saving to increase in this stage of the life cycle. Rather, it is likely for contractual saving to change in the opposite direction because of (1) less need for the protection which life insurance affords, and (2) the making of the last payment on mortgage contracts by some people in this age group.

Secondly, contractual saving is heterogeneous. This gives rise to difficulties both conceptual and operational. It can be argued that there is a need for a separate theory for each component. To thoroughly test such theories and to integrate them would be a huge task. On the operational side, there are several possibilities stemming from the heterogeneity of components. The two principal components are life insurance premiums and mortgage principal payments. Life insurance premiums may be related to a variable directly while mortgage payments may be related to the same variable inversely, or vice versa. The pull in the opposite direction may be sufficient to offset so that the variable may prove to be insignificant in explaining the variance in total contractual saving. On the other hand, the pull in the opposite direction may not be sufficient to offset and consequently the variable may be significantly related to both life insurance premiums and total contractual saving. The simplest case is that of a relationship between a variable and both total contractual saving and its components in the same direction. Another possibility is that a variable may be significantly related to another component. Again, there are two possible results with respect to total contractual saving. The variable may or may not bear a significant relationship to aggregate contractual saving.

Thirdly, the integrated field of economics and psychology has not sufficiently developed to provide adequate guidance in the formulation of hypotheses. Therefore, the selection of variables was, to a certain extent, based on knowledge obtained from preliminary cross runs of the data rather than exclusively on a priori reasoning.

Basic Theoretical Considerations

In spite of these difficulties, some theoretical background will be provided. Since life insurance premiums dominate contractual saving, it was thought advisable to formulate hypotheses mainly with respect to that component. It is possible that the variables, which are used in testing the hypotheses, may be related to the rest of contractual saving in the same way that they are related to life insurance premiums. As we shall see later, our research will be comprehensive enough to detect whether or not this is so.

Whether or not a spending unit does in fact make an outlay be it saving or spending depends upon: (1) the ability to make the outlay, (2) a need for the benefits flowing from the outlay, and (3) a third factor, psychological in nature, viz., how the person responsible for the outlay perceives the need for it. On the one hand, there may be no biological need for a good but someone may feel that he needs it in order to keep up with the Joneses. On the other hand, an uneducated person who lacks foresight may genuinely need life insurance but may not be able to perceive a need sufficient to induce him to buy a policy.

It is generally recognized that income is the best measure of the ability to save and spend. We believe aggregate contractual saving and its two principal components will be found to be significantly and directly related to income. Not all spending

units of a given level of income, however, have the identical ability to save contractually. Demands upon income must likewise be considered. A spending unit with an income level of $4,000 and two children under eighteen certainly is likely to have more ability to pay than one with the same level of income but with four children.

Since commitments to save contractually are typically long-term commitments, future income may likewise be an influencing factor but this is somewhat dubious. A priori, expected income for the next year would not seem to be important. Furthermore, tables in which expected income was used as a variable within income groups showed little promise. Data on long-term anticipations of income were not available. Even if they were, long-term perceptions may not be sharp enough to be of great importance. It is conceivable that stability of income may be relevant in this connection since it would seem to enhance the ability to make relatively fixed commitments.

Since assets, particularly liquid assets, can be sold to furnish funds to make contractual payments, their ownership does constitute ability to pay. However, this ability is ephemeral unless a great volume of liquid assets are held which the owner gradually plans to liquidate systematically in small amounts. Indeed, if such were the case, it might be asked: "Why did not the owner sell the liquid assets in the first place in order to obviate the unpleasant mortgage?" Furthermore, liquid assets, in a sense, are a substitute for the protection which life insurance affords; other things being equal, the need for protection varies inversely with the possession of wealth. This variable was not promising within income groups in exploratory tables.

Next, the factors related to the need for life insurance will be considered. While some people may buy life insurance policies

as an investment or for reasons related to taxes, it is here assumed that life insurance is needed principally as protection against the risk of the death of a person with dependents. A person without dependents has only a limited amount of need for insurance, viz., for burial purposes. How much life insurance is needed for a married spending unit would depend upon (1) the number of dependents, (2) the plane of living desired for the dependents, and (3) how long a period that plane of living must be maintained in the event of the insured against contingency. Insofar as the standard of living is concerned, it is extremely likely that this will be geared to the level of income to which the insured has been accustomed. To that extent, income assumes importance in a second role. For a married couple, the need for insurance is constantly changing, increasing as children are born, decreasing as the wife and the children become older. To fully account for the need factor is complex, since it has manifold facets such as the amount of debt the spending unit has outstanding, the intention of sending children to college, and the earning capacity of the wife should the husband die. Since commitments to pay life insurance premiums are not changed readily, the fact that the need for insurance is constantly changing merely means that adjustment to need is likely to be very rough in the case of most spending units.[1] Neither is an elaborate need theory very helpful operationally (1) because of the lack of availability of complete data, and (2) because it is difficult in a multiple regression analysis to prove the significance of a variable with many points in its scale unless the function is linear or unless the exact nature of its curvilinearity is known.

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[1] There are exceptions. Some level-premium policies provide for a decreasing amount of insurance as the children grow.

It is by no means sure that the need factor, given income, will prove to be positively related to the level of life insurance premiums, since the ability to pay operates in the opposite direction, e.g., a spending unit with children not only needs much more protection than one without children but also is forced to spend more on basic food, clothing, and medical expenses. Whether greater need or less ability proves to be more important remains to be seen.

A simple way to test for the need factor would be to distinguish three groups: the single, the married without children, and the married with children. Clearly age would be correlated with the foregoing stages. Therefore, it can be cogently argued that age should not be placed in the analysis as a separate variable since it would be an approximate substitute[1] and, consequently, one or both variables may not seem to be important whereas in reality they may be. On the other hand, it is possible that age may have an effect independently of marital status and the presence of children. It is conceivable that a very young person may not consider buying life insurance at all, whereas a somewhat older one may do so in anticipation of marriage even though that marriage is not immediately in the offing. Of the married couples whose children are grown, age likewise may have an effect. Among the relatively younger ones, life insurance payments may continue for some time because of pure inertia. At an older age, it is more probable that this inertia may be overcome. True, if age has any effect independently of marital status and the presence of children, it should be expected to be a feeble one.

In summary then, a priori there are grounds for believing that life insurance premiums would vary directly with marital

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[1] This, of course, would partially depend upon the manner of scaling.

status and the presence of children and inversely with age extremes. Furthermore, there is no reason for mortgage payments to behave radically differently from life insurance payments with respect to marital status and children. Single persons are much more likely to be renters than married people: they simply do not require all the space that a home provides; a small apartment is entirely adequate for them. Also, married couples with children need a larger home than those without heirs. After taking these thoughts into account, there need not be an additional expectation of mortgage payments being sensitive to age extremes.

It is logical to suppose that perception of the need for life insurance is a function of foresight which in turn is mainly a function of general education. Regardless of whether or not life insurance agents educate, their efforts probably vary directly with the size of communities and can be expected to influence life insurance payments accordingly. The effect of community size on mortgage payments is more difficult to assess, although it may work in the opposite direction. At one time, home ownership was considerably rarer in the large communities than in the smaller towns and rural areas. Since home ownership recently has become more widespread, the difference probably is not very pronounced. As far as aggregate contractual saving is concerned, the size of community does not seem to be a promising variable.

Other Theoretical Considerations

While the above constitutes our basic theory, there are other less impelling hypotheses. Two variables, viz., (1) veteran status and (2) the number of income receivers, were selected partly because of theoretical considerations and partly because they were used in the study of life insurance premiums by

Kreinin, Lansing, and Morgan;[1] therefore, the question of whether or not the relationships are stable arises since they did not use data of the same year as the author did. (The size of community was also used in their variance analysis.)

According to the general law of demand, the readiness of buyers to enter a market and/or the quantity they are willing to purchase varies inversely with price. Therefore, if a "bargain" is made available to one group but not to another, the first group is likely to consist of more frequent purchasers or to purchase larger amounts. This principle may apply to veterans (1) with respect to the availability of life insurance which is much less expensive than that offered by private companies, and (2) with respect to the availability of mortgages on slightly more favorable terms.

Since the "price" advantage of the veteran is much less in the latter case, its relevance there is much less likely to be significant. The question is one of the interest-elasticity on the demand side of the mortgage market. The vast majority of economists have shifted from the Classical position of belief in great interest-elasticity to that of little interest-elasticity, at least with respect to small differentials in the interest rate. The decision to purchase a home is a major one in which a small difference in the interest cost is probably not overriding in the minds of buyers. While a small difference in the interest rate does really over time amount to a large difference in the total cost of a home, buyers are much more likely to think in terms of the monthly mortgage payment. Furthermore, the advantage of veterans in the mortgage

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[1] Mordechai E. Kreinin, John B. Lansing, and James N. Morgan, "An Analysis of Life Insurance Premiums," Review of Economics and Statistics, XXXIX (February, 1957), pp. 132-158.

market is often only nominal. In many localities, lenders have not been willing to provide funds on mortgages guaranteed by the Veterans Administration since the interest rate is below that in the general market.

Thus far, our theory has implied that if veteran status is important, it is likely to be positively related to contractual saving. A contrary hypothesis is logical—especially for the data of 1949 which will be used in our analysis. Since contractual commitments to save are long-term commitments, they are not entered into readily. In the early post-World War II period, many veterans were in colleges, trade schools, or temporarily employed. At any rate, they were not nearly as fully adjusted to civilian life as non-veterans. For this reason, other things being equal, they are less likely to have made commitments to save contractually. This consideration is less important in the decision to make insurance payments than it is in the decision to buy a home.

Next, let us consider the number of income receivers. A working wife usually accounts for the lack of singleness of income receipt. If a wife works, there will probably be greater pressure for spending and less for total saving than if she did not, given the same total amount of income for the spending unit. If a wife works, it would seem that the following would loom prominent among the other reasons for doing so: (1) general difficulty in balancing the family budget, (2) the desire on the part of the wife to be financially more independent and, consequently, likely to spend additional income, and (3) the desire to work temporarily to meet an unusual outlay or to reduce specific indebtedness. Even if a wife is thrifty, it is likely that a spending unit in which both husband and wife work will spend more than one in which only the husband works because of (1) additional portal to portal

expenses, (2) greater expenditure on clothing, hairdressing, etc., (3) the extra cost of the wife's noonday meal bought at a cafeteria or restaurant, (4) the greater cost of evening meals eaten at restaurants which otherwise might be eaten at home, and (5) the greater cost of laundry which otherwise might be done at home. How the general tendency to save less will affect contractual saving is not altogether clear. It may not influence all components alike. It seems that if life insurance payments are altered, they would be lower partly because the death of one of two workers would not have as serious a financial impact, there being one less dependent in the original situation. While for some spending units, there may be less likelihood to purchase a home, for other spending units, the opposite is true if the unusual outlay which is planned is the downpayment on a home. Also, the mortgage may have been contracted before the wife started working. The net effect on total contractual saving remains to be seen.

Two additional factors were brought into the study: (1) race and (2) change in income. Race is interesting to the sociologist even though the economist may not find it of great importance as a variable. There is a strong argument for assuming that race has no effect—that economically speaking, it can be explained in terms of the effects of income and education.[1] If race should be important, obviously discrimination would appear to be a clue. The direction that racial discrimination would have upon mortgage payments is not clear. On the one hand, would a shrewd lender discriminate against a Negro whose capacity to repay is the same as that of a white? On the other hand, among high income people, are Negroes likely to find the same availability of satisfactory

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[1] In spite of this, race did prove to be significant in some of the equations which will be presented later.

rental units as whites? If not, the incentive for Negroes to buy homes (and hence, to undertake mortgages) would be greater. Furthermore, can a Negro buy a home at the same price as a white? By selling to a Negro, one may incur the wrath of one's prejudiced former neighbors. It would seem likely that a Negro in order to secure a home must outbid the white buyers in the market. If this should be so, it would follow that other things being equal, a Negro homeowner would be shackled with a higher mortgage than a white.

That racial discrimination should influence life insurance payments after taking out the effects of income and education does not seem probable. It is possible that burial insurance may be more traditional among Negroes than among whites. If so, this is more likely to affect the frequency of insurance payments rather than their amount.

Although change in income has been rather thoroughly studied in Chapter 3, there seems to be reason to use it in a multivariate analysis to see whether it again proves to be insignificant.

B. Technical Considerations

The Disadvantages of Tables and of Simple Regressions as Applied to Them

Tabular distributions represent the simplest form of presentation of the results of sample surveys. In comparison with multivariate analysis, they have the advantage of greater detail with respect to one or two variables. On the other hand, tabular distributions have genuine disadvantages which are related to one another. (1) A genuine relationship may not appear because the effect of other variables has not been removed;

if the effect of some could be eliminated, there is less that a single other variable need explain. (2) A spurious relationship may appear because of intercorrelation among variables. (3) The third point is very closely connected with the second: if an attempt is made to hold several of the intercorrelated variables constant, the size of cells becomes too small for confidently made conclusions.[1]

A graphic experimental example of the difficulties in which one may find himself if he attempts to show the significance of one variable in a simple distribution while attempting to hold another one constant will now be presented. The objective is to discover whether single persons save less contractually than do married couples. An obvious difficulty is the strong correlation between the level of income and marital status. When income is not taken into account, marital status appears to be clearly associated with a high level of contractual saving but is this relationship genuine or merely a spurious one based on income differences? The extent to which the effects of income are removed varies directly with the narrowness of the income band which is selected. First, a fairly narrow band of disposable income was selected from data based on the 1950 Survey of Consumer Finances, $3,800-$4,999. Contractual saving, of course, was the dependent variable while the independent variable was scaled simply: zero for the single persons and one for the married people. Marital status did not prove to be significant in the following equation:

$$\text{Contractual Saving} = \underset{(49.8196)}{90.8606\ X_1} + \$265.71.$$

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[1] Frequently holding a variable constant is an impossible task, e.g., if analysis takes place within income groups, there is always variation of income within the group itself.

However, when the income band was broadened to $3,600-$10,000, it did prove to be significant:

$$\text{Contractual Saving} = \underset{(61.3844)}{165.3852\ X_1} + \$315.23.$$

On the one hand, if we try to take out most of the income effect by using a narrow band, there are too few cases to prove significance. On the other hand, are the significant results in the second equation partly due to income? This is the essence of the dilemma which prompted us to turn to multiple regression analysis.

Multiple Regression Analysis—Its Advantage and Disadvantages

Multiple regression analysis has a great advantage over the foregoing technique in that additional variables can be taken into account without reducing the number of cases in the sample which is tested.[1] In comparison with tabular distributions, it has the disadvantage of a loss of detail. When the detail is deceiving, this loss is not serious. However, the use of multiple regression analysis is not without problems. (1) The true significance of a variable may be hidden because of the attempt to fit a linear function through a curvilinear relationship. (2) The problem of intercorrelation between the independent variables remains.

The basic computations required for a multiple regression can be supplemented not only (1) to inquire into the significance of an independent variable, but also (2) to show the percentage of the total variance explained by each of the independent variables. In this chapter, we are concerned with the first problem. In Appendix

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[1] For an explanation of multiple regression analysis, the reader can refer to Frederick E. Croxton and Dudley J. Cowden, Applied General Statistics, (1st ed.; New York: Prentice Hall, Inc., 1944), pp. 740-769.

B, the percentage of total variance explained by the independent variables in equations (1) and (10), two of our main equations, will be shown.

Problems in the Handling of Income and in the Selection of Income Bands

The author was interested in the possible interaction between income and other independent variables. Therefore, his research included an analysis for both high income and low income groups. Hence, the question of the breadth of the income band to be selected rears its ugly head again. If a broad income band is used with income included as an independent variable, the two problems mentioned above plague us. In other words, there are two arguments for narrowing the income band provided a sufficient number of cases is left. (1) If income is omitted as an independent variable, there is no need to worry about the intercorrelation between income and the other variables, such as marital status and education, causing a rejection of the significance of the latter factors. (2) There is a greater likelihood of picking up a curvilinear relationship with a linear fit, since over a shorter distance a straight line is a closer approximation of a curve than over a longer distance. The author actually prepared several multiple regressions using narrow bands of high and low income but then questioned the wisdom of doing so while leaving out income as an explanatory variable.[1]

The proviso that a sufficient number of cases be left is an important one. The effect of doubling the sample size on the chances of showing significance can be stated with reference to a simple regression by means of some rudimentary calculations.

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[1] These regressions will not be presented.

If a constant ratio between the total sum of squares and the explained sum of squares be assumed, the doubling of the sample size will then double both of the foregoing sums as well as the unexplained sum of squares. Since the degrees of freedom are approximately doubled, the unexplained variance will remain about the same. The sampling variance will become approximately one-half of what it would be in the smaller sample, while the sampling error will be about five-sevenths of what it would be. This will mean that through the doubling of sample size, the ratio between the parameter of a variable and its sampling error will be increased by roughly forty per cent. While the latter ratio increases less than proportionately with the size of the sample, the increase, nevertheless, is substantial.

The omission of income as a variable is questionable, to say the least, if income were to prove significant within the breadth of the selected narrow income band. The more variance that is explained by other variables, the less that need be explained by a given variable. Therefore, one could justifiably look askance at the knowing omission of an important variable and hence, the reduction of the chance of showing the significance of other variables. It was found impossible to narrow the income band sufficiently to remove the significance of income while still retaining a sufficient number of cases to adequately test the other variables. This problem is present only to a lesser extent in multiple regression analysis than it is in simple regression analysis while attempting to hold several variables constant. This conclusion was reached after performing a multiple regression with the data of the narrow disposable income band of $3,800-$4,999 in which disposable income was used as an independent variable along with seven other independent variables in explaining the level of life

insurance premiums.[1] Without presenting all of the details, it should be noted that in this band of only three hundred and sixty-six cases, the coefficient of disposable income was approximately three and one-third times its sampling error. The extreme potency of income as an explanatory variable should be noted. That it should be important over the entire income range is not surprising but that it should prove to be significant over such a narrow range for a small sample is indeed remarkable.

The considerations in the two immediately preceding paragraphs led the author to alter his research design to (1) include disposable income as an explanatory variable in the same regressions with other variables, and (2) to broaden both the low and high income bands with which he had previously dealt.

C. The Research Design

The Dependent Variables

Our research design and choice of variables has already been partially stated or inferred. There is still a need to completely spell out the precise details. A total of eighteen multiple regressions were performed: nine for the low income band of 1007 spending units extending from a disposable income of $700 to $2899 and nine for the high income band of $2900 to $9999. For each of these bands, contractual saving as well as its two principal components, life insurance premiums and mortgage principal payments, were studied in a three-fold fashion: (1) in terms of the dollar field for all spending units in the group, (2) in terms of the dollar field for only those spending units who do in fact make the respective

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[1] The data were extracted from the 1950 Survey of Consumer Finances of the Survey Research Center. These data pertained to the year 1949.

outlay, and (3) by using the entire group but instead of treating the dollar field as the dependent variable, scaling those spending units who do make payments as "ones" and those who do not make the payments as "zeros" in an attempt to discover whether the independent variables are important in distinguishing the fact of payment rather than its amount. The data, which refer to the year 1949, were taken from the 1950 Survey of Consumer Finances of the Survey Research Center of the University of Michigan.

Although our interest centers mainly in contractual saving, it was decided to prepare regressions not only for aggregate contractual saving but also for its two principal components, payments of life insurance premiums and of mortgage principal. It is possible that few variables will be discovered to be important in relation to aggregate contractual saving. Yet some of these very same variables may be significant in explaining the level of a component or whether or not spending units make the outlay at all. One component may be related to a variable in one direction and the other in the opposite direction or not at all. This is not a wholly useless piece of information since the composition of contractual saving may change and hence, the weight of a variable in explaining the aggregate of contractual saving may become different. It is for this reason that the same independent variables were used in conjunction with the different dependent variables mentioned above. The objective of this very modest research design was merely to produce a few simple results which could be integrated in casting a ray of light on the explanation of aggregate contractual saving from which other more experienced researchers could proceed.

The dependent variables will be symbolized in the following manner:

CS_a = the dollar amount of contractual saving of the spending unit when spending units in the income band are included

L_a = the dollar amount of life insurance payments by the spending unit when all spending units in the income band are included

M_a = the dollar amount of mortgage principal payments by the spending unit when all spending units in income band are included

CS_b = the dollar amount of contractual saving of the spending unit when those spending units which do save contractually are included

L_b = the dollar amount of life insurance payments by the spending unit when those spending units which do make payments are included

M_b = the dollar amount of mortgage principal payments by the spending unit when those spending units which do make payments are included

CS_c = (0 if the spending unit did not save contractually
(1 if the spending unit did save contractually

L_c = (0 if the spending unit did not make life insurance payments
(1 if the spending unit did make life insurance payments

M_c = (0 if the spending unit did not make mortgage principal payments
(1 if the spending unit did make mortgage principal payments

The Independent Variables

The independent variables in the sequence in which they will appear in the equations are: (1) race (R), (2) age (A), (3) veteran status (V), (4) education (E), (5) disposable income (DY) (6) community size (C), (7) the number of income receivers (IR), (8) marital status and children (MC), and (9) income change (YC). They are scaled in the following fashion:

R = (1 if the head of the spending unit is white
(2 if the head of the spending unit is Negro

$$A = \begin{cases} (1 \text{ if the age of the head of the spending unit is between} \\ \quad 18\text{-}24 \text{ inclusive or } 65 \text{ or over} \\ (2 \text{ if the age of the head of the spending unit is between} \\ \quad 25\text{-}64 \text{ inclusive} \end{cases}$$

$$V = \begin{cases} (0 \text{ if the head of the spending unit is not a veteran} \\ (1 \text{ if the head of the spending unit is a veteran} \end{cases}$$

$$E = \begin{cases} (1 \text{ if the head of the spending unit did not attend college} \\ (2 \text{ if the head of the spending unit had one or more years} \\ \quad \text{of a college education} \end{cases}$$

$DY =$ the dollar amount of disposable income of the spending unit

$$C = \begin{cases} (1 \text{ if the spending unit resides in a town under } 2{,}500 \text{ or in} \\ \quad \text{open country} \\ (2 \text{ if the spending unit resides in a town above } 2{,}500 \text{ but} \\ \quad \text{not in one of the twelve largest metropolitan areas} \\ (3 \text{ if the spending unit resides in one of the twelve largest} \\ \quad \text{metropolitan areas} \end{cases}$$

$$IR = \begin{cases} (0 \text{ if the number of the income receivers in the spending} \\ \quad \text{unit is one} \\ (1 \text{ if the number of the income receivers in the spending} \\ \quad \text{unit is two or more} \end{cases}$$

$$MC = \begin{cases} (0 \text{ if the head of the spending unit is single} \\ (1 \text{ if the head of the spending unit is married but without} \\ \quad \text{children} \\ (2 \text{ if the head of the spending unit is married and has one} \\ \quad \text{or more children} \end{cases}$$

$$YC = \begin{cases} (1 \text{ if the total income of the spending unit decreased five} \\ \quad \text{per cent or more} \\ (2 \text{ if the total income of the spending unit changed less} \\ \quad \text{than five per cent} \\ (3 \text{ if the total income of the spending unit increased five} \\ \quad \text{per cent or more} \end{cases}$$

A variable may prove to be significant in explaining whether or not people do in fact save contractually but not necessarily in the corresponding regression where the dollar amount of contractual saving is the dependent variable. In this case, it can hardly be said that the factor is relevant in explaining the characteristics of

contractual savers; but nevertheless, it is pertinent in explaining the total amount of contractual saving indirectly since that is a function of zero contractual saving as well.

George Katona has pointed out that "information about activities that are shared by a very small proportion of the population cannot be obtained in a reliable way in cross section surveys."[1] Therefore, it should not be expected that we can learn a great deal about the characteristics of the people who make mortgage payments. This is particularly true of the low income people. While in 1949, only twenty per cent of all income groups made payments on mortgage principal, the percentage for the low income group is only 9.9 and for some sub-groups much lower still.

The simplicity in the scaling of the independent variables should be noted. Whether an explanatory variable proves to be significant and how much variance it explains depends partly on the manner of scaling. It is possible that some of the variables are related to one or more of the dependent variables in a curvilinear way. If the precise nature of the curvilinearity were known, it would be possible to show a higher level of significance for some of the variables by selecting a more complicated manner of scaling. Of course, it also would have been possible to explain a higher percentage of total variance.

The Eliminated Cases

The sample used for analysis does not include the entire sample of the 1950 Survey of Consumer Finances of the Survey Research Center partly because of necessity and partly because of

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[1] George Katona, "Variability of Consumer Behavior and the Survey Method," Contributions of Survey Methods to Economics, ed. by Lawrence R. Klein (New York: Columbia University Press, 1954), p. 62.

choice. Hence, it is not fully representative. First of all, farmers and other businessmen are excluded because they are peculiar groups which can be studied separately. These entrepreneurial groups have a strong motivation to save because of their business need for funds; hence, if they should be included, the sample would not be truly "consumer" in motivation. Secondly, their affairs are partly business and partly personal but it is impossible conceptually to separate them; hence, the "business profit" figure as it enters income is, at best, a rough estimate.

While most interviews obtain answers to most questions, many have one or more questions for which the answer is not ascertained. Interviews in which information about one or more of the dependent or independent variables was unavailable are eliminated in all of the regressions.

In cases of extremely high contractual saving, the reliability of the information is suspect. For this reason, they are omitted. What appears as very high contractual saving, may rather be a large, unusual discretionary payment on a mortgage, life insurance contract, or annuity rather than a habitual one.

Finally, as previously mentioned, the cases of extremely high (above $10,000) or low (below $700) disposable income are excluded. One of the assumptions of regression analysis is that of constant variance, whereas for the income extremes there is likely to be greater variance than for the rest of the population. Some of the people in these income brackets have experienced merely a temporary change in their incomes which does not entail a change in contractual commitments. Also, those of great means have more latitude in determining contractual saving than those of more moderate means.

D. The Research Results

The Equations and the Correlation Matrices

The multiple regression equations will now be presented; first, for the high income group (equations 1 through 9) and then, for the low income group (equations 10 through 18). The number of cases used in the computations for equations 1, 2, 3, 7, 8, and 9 are 1071; for equations 4, 5, and 6, they are 988, 948, and 336 respectively. The number of cases used in the computations for equations 10, 11, 12, 16, 17, and 18 are 1007; for equations 13, 14, and 15, they are 700, 651, and 100 respectively.

(1)[1] CS_a = 151.69R + 22.26A - 46.40V + 65.91E + .096472DY
(73.02) (41.53) (25.24) (27.24) (.009458)

+ 00.39C - 48.74IR + 80.16MC - 02.56YC - $444.43
(16.32) (25.24) (17.61) (15.47)

(2) L_a = - 37.41R + 20.16A - 10.06V + 48.91E + .033133DY
(25.15) (14.13) (8.96) (9.38) (.003258)

+ 18.67C - 21.05IR + 33.69MC - 5.48YC - $126.92
(5.62) (8.69) (6.07) (5.33)

(3) M_a = 169.48R + 26.41A - 24.63V - 34.32E + .041107DY
(63.66) (36.21) (22.01) (23.75) (.008246)

- 07.97C - 28.68IR + 57.27MC + 04.71YC - $288.35
(14.23) (22.01) (15.35) (13.49)

(4) CS_b = 129.68R - 21.42A - 56.49V + 77.17E + .100075DY
(73.87) (46.58) (26.36) (28.72) (.009929)

+ 00.47C - 50.16IR + 71.68MC - 07.13YC - $317.80
(17.17) (26.44) (18.77) (16.30)

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[1] The coefficient of correlation for equation 1 is .372. What was said in the footnote on page 62 concerning the applicability of the standard errors is also true here.

(5) L_b = - 50.75R - 01.86A - 13.29V + 55.66E + .036151DY
(24.95) (16.13) (8.93) (9.76) (.003417)

+ 19.91C - 24.06IR + 25.22MC - 9.79YC - $54.01
(5.83) (8.95) (6.43) (5.51)

(6) M_b = 291.31R - 83.79A - 77.68V - 20.16E + .064964DY
(145.48) (143.71) (59.55) (66.07) (.021372)

- 45.00C - 37.45IR - 15.86MC + 2.85YC - $158.74
(40.51) (60.37) (54.30) (37.17)

(7) CS_c = .07727R + .11567A + .01088V - .01684E
(.05089) (.02894) (.01759) (.01898)

+ .000011263DY + .00438C + .01424IR + .04461MC
(.000006591) (.01137) (.01759) (.01227)

+ .01052YC + .48851
(.01078)

(8) L_c = .07973R + .13512A + .00228V - .00934E
(.06042) (.03437) (.02089) (.02254)

+ .000008040DY + .01013C + .01564IR + .07084MC
(.000007826) (.01350) (.02089) (.01457)

+ .01340YC + .36120
(.01280)

(9) M_c = .14668R + .08625A - .00067V - .06829E
(.08625) (.04906) (.02982) (.03218)

+ .000047232DY + .00902C - .04551IR + .15597MC
(.000011173) (.01927) (.02982) (.02080)

+ .00991YC - .36613
(.01827)

(10)[1] CS_a = 32.70R + 31.76A + 2.82V + 46.71E + .052052DY
(18.21) (9.77) (10.62) (12.03) (.007650)

- 0.56C - 7.29IR + 18.83MC + 1.91YC - $168.08
(5.95) (12.81) (6.18) (5.48)

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[1] The coefficient of correlation for equation 10 is .349.

(11) L_a = 12.11R + 10.45A + 3.98V + 23.97E + .025421DY
(9.30) (4.99) (5.42) (6.15) (.003907)

+ 2.47C - 3.27IR + 10.73MC - 1.48YC - $66.11
(3.04) (6.54) (3.16) (2.80)

(12) M_a = 18.61R + 6.88A + 3.42V + 1.06E + .016117DY
(13.92) (7.52) (8.02) (3.05) (.005891)

+ 1.94C + 4.39IR + 16.91MC + 3.30 YC - $61.12
(4.58) (9.78) (4.63) (4.20)

(13) CS_b = 21.19R + 32.48A - 0.20V + 61.47E + .045632DY
(22.18) (13.50) (13.80) (15.90) (.010595)

- 4.84C + 0.92IR + 20.34MC - 1.74YC - $116.54
(8.05) (10.54) (7.93) (7.19)

(14) L_b = -6.65R - 4.75A + 2.40V + 37.69E + .019595DY
(11.55) (7.00) (7.13) (8.30) (.005490)

- 0.87C + 3.42IR + 11.36MC - 6.30YC - $15.09
(4.15) (9.01) (4.11) (3.69)

(15) M_b = - 1.79R + 29.50A - 22.43V + 84.63E + .032165 DY
(69.49) (57.60) (58.19) (88.63) (.046106)

- 29.04C - 37.27IR + 17.75MC + 44.74YC - $21.11
(32.10) (52.48) (34.51) (26.88)

(16) CS_c = .15496R + .10667A + .02401V + .02614E
(.05809) (.03116) (.03387) (.03838)

+ .000179499DY + .03064C - .06991IR + .03056MC
(.000024402) (.01898) (.04087) (.01971)

+ .03760YC - .18190
(.01747)

(17) L_c = .12975R + .11393A + .02388V - .01146E
(.06050) (.03245) (.03527) (.03997)

+ .000176479DY + .04556C - .07802IR + .03272MC
(.000025415) (.01977) (.04256) (.02053)

+ .04485YC - .21254
(.01820)

$$(18)\quad M_C = \underset{(.03875)}{.07378R} + \underset{(.02078)}{.01286A} + \underset{(.02259)}{.00841V} - \underset{(.02560)}{.02253E}$$
$$+ \underset{(.000016278)}{.000051905DY} + \underset{(.01266)}{.01950C} + \underset{(.02726)}{.03546IR} + \underset{(.01315)}{.05594MC}$$
$$- \underset{(.01166)}{.01406YC} - .13523$$

Tables 23 and 24 show all the intercorrelations among the explanatory variables. The first table is for the 1071 cases in the high income group which are used in the computations for equations 1, 2, 3, 7, 8, and 9. Although available, the correlation matrices for the populations used in the computations for equations 4, 5, and 6 (pertinent to part of the 1071 cases) are not presented since the coefficients in these matrices do not differ vastly, at least, for the higher coefficients. The second table is for the 1007 cases in the low income group which are used in the computations for equations 10, 11, 12, 16, 17, and 18. The correlation matrices for the samples used in the computations for equations 13, 14, and 15 (including part of the 1007 cases) did not differ sufficiently to warrant their presentation.

It is possible that the rejection of an explanatory variable as being significant may be accounted for by the correlation of it with other independent variables. Herein lies the relevance of the coefficients which are presented. Statisticians have not established a rule as to how high a correlation coefficient need be to be a matter of concern. Such a rule would be merely an arbitrary convention rather than an absolute matter.

In the matrix for the high income group, the highest coefficients are .26909, between education and disposable income, and .28434, between age and marital status and children. By and large, the results of the research with respect to education and disposable income are affirmative. Therefore, the foregoing

TABLE 23

THE MATRIX OF CORRELATION COEFFICIENTS BETWEEN VARIABLES USED IN EQUATIONS 1, 2, 3, 7, 8, 9

	Race (R)	Age (A)	Veteran Status (V)	Education (E)	Disposable Income (DY)	Community Size (C)	Number of Income Receivers (IR)	Marital Status and Children (MC)	Income Change (YC)
R	1.000	.120	- .007	- .063	- .031	.087	.096	- .032	.011
A		1.000	.019	.020	.046	.006	- .015	.284	- .013
V			1.000	.097	- .039	- .020	.107	.136	.154
E				1.000	.269	.100	- .003	- .113	.108
DY					1.000	.169	.166	.017	.082
C						1.000	- .008	- .083	- .017
IR							1.000	- .050	.016
MC								1.000	- .029
YC									1.000

TABLE 24

THE MATRIX OF CORRELATION COEFFICIENTS BETWEEN VARIABLES USED IN EQUATIONS 10, 11, 12, 16, 17, 18

	Race (R)	Age (A)	Veteran Status (V)	Education (E)	Disposable Income (DY)	Community Size (C)	Number of Income Receivers (IR)	Marital Status and Children (MC)	Income Change (YC)
R	1.000	.105	- .042	- .095	- .043	.051	.109	.081	.012
A		1.000	.049	.036	.274	- .091	.027	.296	- .144
V			1.000	.152	.151	- .024	- .019	.136	- .001
E				1.000	.041	.104	- .052	- .213	.073
DY					1.000	.025	.065	.307	.039
C						1.000	- .071	- .266	.052
IR							1.000	.211	- .036
MC								1.000	- .197
YC									1.000

coefficient of correlation between them is unimportant. While the variable, marital status and children, is clearly significant in eight of the nine equations for the high income group, the results with respect to age are less affirmative. The correlation between age and marital status and children may, unfortunately, have colored the results to a limited extent.

In the matrix for the low income group, the highest coefficients are (1) between disposable income and marital status and children (.30688); (2) between age and disposable income (.27423); (3) between age and marital status and children (.29647); and (4) between size of community and marital status and children (-.26587). For three (disposable income, age, and marital status and children) of the four variables just mentioned, the results are fairly affirmative. While it is impossible to deny that intercorrelations among variables has some effect on the results, it is safe to say that their influence is not major.

The Importance of the Variables in Relation to the Dollar Amounts of Saving for All Spending Units

Our interest lies mainly in contractual saving. First, the equations in which the dollar amount of contractual saving for all spending units in the respective income bands shall be considered regardless of whether the dollar amount is positive or zero. Later the equations for only those spending units which have a positive amount of contractual saving will be studied to examine the extent to which the omission of the zero cases of contractual saving makes a difference.

Our approach will be first to investigate contractual saving; second, to see whether the influence on its principal component, life insurance premiums, is similar; and finally, where there are differences to see whether mortgage payments are affected in

the opposite direction from life insurance payments.

Disposable income, marital status and children, and education were considered as factors in our basic theory. It is notable that all three do prove to be significant in a positive direction not only in the high income band (equation 1) but also in the low income band (equation 10). Unless otherwise specified, the term "significant" shall refer to a level of ninety-five per cent or more. Our basic theory has definitely been confirmed. It was considered dubious that age would have an effect additional to that of marital status and children since both are a reflection of the life cycle and the age groups expected to be correlated positively with contractual saving are the middle ones when the need for life insurance and housing is greatest which, likewise, is the period of marriage and dependent children. In spite of this, age is significant at the low income level although not at the high income level.

The remaining variables on a priori grounds were considered marginal. The inferiority of examining income change in the analysis of the data of a single year was explained in Chapter 3. The insignificance of this variable in the dynamic framework of the analysis of the 1947-1948 reinterview study was demonstrated in Chapter 3 but not in a multivariate technique. It was expected that it would assume insignificance in the multivariate work of this chapter. It does in both income bands.

Race does prove to be clearly significant for the high income group and at approximately the eighty-eight percent level for the low income group—this, in spite of the hypothesis which is sometimes made that the apparent effect of race is merely the hidden effects of income and education. Furthermore, the direction of the effect is notable, namely, that the Negroes have significantly more contractual saving than white people. How the components of

contractual saving are related to this will be described later.

In our theoretical reasoning, it was not clear how veteran status, the number of income receivers, and the size of community would affect contractual saving. These variables are included because they can conceivably affect life insurance premiums and hence may influence aggregate contractual saving unless mortgage payments act in a neutralizing way. To be neutralizing, it is not necessary that mortgage payments be significantly related to the variable in the opposite direction. If the relationship of the explanatory variable with life insurance payments should be a weak one, it may not appear in connection with aggregate contractual saving.

Within the low income band, none of the three variables indicate importance. However, at the high income level, veteran status and the number of income receivers do not miss the ninety-five per cent level of significance by a great deal (veteran status, approximately 86% and the number of income receivers, approximately, 87%). The direction of the effect for the number of income receivers is the same as that anticipated for life insurance premiums, namely, inverse. In the case of veteran status, the non-veterans have more contractual saving. Our secondary hypothesis, viz., that in 1949 the veterans were not as completely adjusted to civilian life as the non-veterans and hence, were less likely to make contractual commitments, seems to be dominant. However, at the level of significance indicated, there cannot be complete confidence in this. Of course, the same is true elsewhere when the level of significance is below ninety-five per cent.

Brief comment on the dollar amount of the components of contractual saving for all spending units in our sample is in order to see whether the effect on life insurance premiums, the principal component will be similar to that on aggregate contractual saving

and where there is a difference, to discover whether or not mortgage payments are affected in the opposite direction. In general, the effect on life insurance premiums is very similar to that on aggregate contractual saving. For the low income band (equation 11), all of the variables which were clearly significant for aggregate contractual saving are also clearly significant for life insurance premiums.[1] The same is true for the high income band (equation 2) with one exception, namely, race. The importance of race in influencing aggregate contractual saving can empirically be accounted for in terms of its significance in relation to mortgage payments (equation 3). The hypothesis that Negroes are discriminated against as tenants and, consequently, are encouraged to buy their own homes is consistent with these results. However, the extreme paucity of Negroes in the high income band precludes thorough confirmation of this idea since a few high but atypical values may distort the results.

There is one variable which is clearly significant for life insurance premiums only within the high income band, namely, the size of community. The direction of this effect is a direct one as had been expected.

We are now in a position to compare the effects of community size, the number of income receivers, and veteran status on life insurance premiums with those found by Kreinin, Lansing, and Morgan in their study of life insurance premiums of 1953. Their results were entirely affirmative. Ours are affirmative for only two of the three variables, size of community and the number of income receivers, and then only for the high income group. The differences in results are by no means contradictory since there

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[1] Within this band, there are no additional variables which are significant for life insurance premiums but not for aggregate contractual saving.

are differences in both technique and data. They applied variance analysis to premiums as a per cent of income without dividing the population into high income and low income groups although they did test for some interaction effects. More fundamentally, the data which they studied could well have been different with respect to veteran status than those of 1949.

The Importance of the Variables in Relation to the Dollar Amounts of Positive Saving

Now the equations for only those spending units which have a positive amount of contractual saving will be scanned to determine whether or not the omission of the zero cases makes a great difference. Briefly, but with some qualifications, the answer is "no", especially for the low income band which will be considered first (equation 13). For that band, four variables are clearly significant in relation to aggregate contractual saving—age, education, disposable income, and marital status and children—regardless of whether the whole group (equation 10) or only those who do make payments (equation 13) are analyzed. However, when the zero cases are omitted, the results are a bit more negative. While race is significant at approximately the eighty-eight per cent level when the zero cases are included, it loses what slight importance it had when these cases are excluded although it retains the same sign.

Next, follows the scrutiny of the equation for life insurance premiums when the zero cases are not part of the sample (equation 14). Regardless of how the zero cases are handled, education, disposable income, and marital status and children are significant whereas age shrinks into insignificance when the zero cases are excluded.[1] There is also a slight second difference. In this

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[1] It should be remembered that age was not expected to have a powerful effect on theoretical grounds.

equation, income change assumes a bit of significance for the first time (roughly at the 87% level) in an inverse direction. For the high income band, the results with respect to income change are similar.

At first blush, the sign of the income change variable seems perplexing. The low level of significance casts doubt on the reality of the association, of decreases in income with higher premiums, as does the relative inaccuracy of the income change variable in a one-year study. After deeper reflection, however, the sign of the income change variable is not strange. According to the theory of multiple regression analysis, in testing the significance of one independent variable, the effects of other variables are removed. In our equations, disposable income is one of the independent variables. Therefore, in testing other variables, theoretically the effect of income should be removed. Another way of removing the effect of income when it bears a proportional relationship to the variable to be explained, is to treat the latter variable as a percentage of income. In other words, the results which we have gotten in testing change in income are similar to those which we would have gotten if income had been omitted as an independent variable and the dependent variable had been the ratio of life insurance premiums to income.

Now then, it is not at all surprising to find that people with decreases in income pay life insurance premiums which are a higher <u>percentage</u> of their income than those people whose incomes have remained the same or have increased. The type of income change which is important in explaining the change in payments of life insurance premiums is one of a long term nature. That there is a lag in the adjustment of life insurance premiums to changes in income measured between two years has been demonstrated in Chapter 2.

It can be shown that quite a few of the decreases in income in 1949, a year of a short recession, were expected to be ephemeral. When people were asked at the beginning of 1950 whether they expected their incomes for 1950 to be about the same, or larger or smaller, 31.4 per cent of those with decreases in income of five per cent or more and 43.3 per cent of those with decreases in income of twenty-five per cent or more said they expected larger incomes.

Although the type of income change which is important in this connection is one of a longer-term nature, in a given year some people with income increases move from a zero level of premiums to a positive level and some with decreases in income move from a positive level to a zero level. The former are included in the sample when the dependent variable is the dollar amount of payments by those who make them, even though they may not have a great amount of insurance. At the same time, the latter are automatically excluded from the sample. Consequently, there is an automatic bias in the testing of income change since some of the cases of downward movement of life insurance payments are omitted.

Next, the high income equation for only those spending units which have a positive amount of contractual saving (equation 4) will be compared with the already described results when the spending units with a zero amount of contractual saving are included as well (equation 1). As was true for the low income band, the differences are minor. Four variables are found to be clearly significant in explaining aggregate contractual saving (equation 4)—education, disposable income, marital status and children, and veteran status in the direction of the non-veterans having a larger amount. All except the latter one were likewise clearly significant

in equation 1 where it had approximately an eighty-six per cent level of significance. Two additional variables are marginally important—race at the eighty-nine per cent level and the number of income receivers at the ninety per cent level. The former was clearly significant in equation 1 whereas the latter had a similarly low level of significance.

When the equation for those high income spending units which have a positive amount of life insurance premiums are studied (equation 5), six variables are clearly significant and two fall in the borderline category. The former are education, disposable income, community size, the number of income receivers, marital status and children, and race (the white people making larger payments). The latter are veteran status (the non-veterans making larger payments) and change in income (those with decreases making larger payments). All of the definitely significant variables with the exception of race were likewise clearly significant when the zero cases were included (equation 2).

If the results in equations 4 and 5 (aggregate contractual saving and life insurance premiums among those with a positive amount) are compared, it is found that white people and those in larger communities do not have a larger amount of aggregate contractual saving, although they do make significantly larger amounts of life insurance payments. As might be expected, mortgage payments (equation 6) had a neutralizing effect. Negroes, rather than whites, made a significantly larger amount of mortgage payments in 1949 and the size of community was insignificant in explaining the amount of mortgage payments.

The Importance of the Variables in Distinguishing the Positive Savers from the Zero Savers

Finally, the equations in which the dependent variable is one or zero depending on whether or not the spending unit made a payment will be examined—first, for the low income group (equations 16 and 17) and then, for the high income group (equations 7 and 8). For the former group, it makes little difference as far as the significance of variables is concerned whether the dependent variable is taken with respect to the making of aggregate contractual saving or life insurance payments (equation 16 compared with equation 17). In the former equation, four variables, race (the Negroes being ones more frequently than the whites), age, disposable income, and income change are definitely significant; while marital status and children, the number of income receivers (the frequency of contractual saving being inversely related), and the size of community (the larger communities typically having more contractual savers) are in the borderline category. In the latter equation, five variables, race, age, disposable income, size of community, and income change are clearly significant; while marital status and children and the number of income receivers are marginally significant. The sign of the income change variable in both equations is positive, that is to say, those with increases in income are more frequent contractual savers (at least as far as life insurance payments are involved). It will be remembered that the sign of the income change variable was negative when the zeros were excluded. The following inference can be drawn from the combined results: some of the people with decreases in income do cancel their life insurance, whereas many do hold on to it so that the premiums they pay are high relative to income.

The results are less affirmative for the high income class. In distinguishing among those who do and who do not save contractually (equation 7), age and marital status and children are clearly significant while race (the Negroes being contractual savers more frequently than whites) and disposable income are marginal. Age and marital status and children are likewise clearly significant in distinguishing those who make life insurance payments and those who do not (equation 8).

E. Summary

In the present chapter (1) we gave theoretical consideration to the factors which might influence the level of contractual saving, (2) we presented technical reasons for choosing our particular multivariate research design, and (3) we described the results of our research. Contractual saving and its two principal components were studied in a three-fold fashion: (1) in terms of the dollar field for all spending units in the group, (2) in terms of the dollar field for only those spending units who do make the respective outlays, and (3) by scaling those spending units who do make payments as "ones" and those who do not make payments as "zeros" to discover whether or not the explanatory variables distinguish the fact of payment from its absence. Here we shall confine ourselves to the first of the three aspects of the research. We shall focus our attention mainly on aggregate contractual saving and we shall consider its components only incidentally.

In our basic theory, three variables were considered important: (1) disposable income as a measure of the ability to save contractually, (2) marriage and the presence of children as a measure of the need for contractual saving, and (3) education as a measure of the perception of the need. Although probably relevant

in relation to life insurance protection, a college education should not be necessary to impress upon people the need for housing.

Separation of the age extremes conceivably might have an independent influence on the amount of contractual saving but we thought its effect would be weak. Because of the distribution of the efforts of life insurance salesmen, the size of community was expected to be directly related to life insurance payments but it was expected to be unimportant or inversely related to mortgage payments so that its net effect on contractual saving would be negligible.

Race was introduced as a variable to see whether it could be explained in terms of the effects of education and income. Although shown to be insignificant in Chapter 3, change in income was entered to see whether or not it would produce similar results in a multivariate analysis. Two additional factors were brought into the study not only because of theoretical considerations but also to test the stability of the relationships found by others in explaining life insurance premiums: (1) veteran status and (2) the number of income receivers in the spending unit.

In explaining the amount of contractual saving both for the high income group and for the low income group, our basic theory was clearly confirmed: disposable income, marital status and children, and education all proved to be directly significant.[1] The power of their influence was in the order stated with disposable income dominant. Race did prove to be significant for the high income group with the Negroes having more contractual saving mainly because of their higher level of mortgage payments. Age was significant within the low income group only. Neither size of community, veteran status, income change, nor the number of

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[1] The criterion for judging was a parameter at least twice its sampling error.

income receivers were significant in either group. However, the size of community was directly and importantly related to life insurance premiums in the high income group.

APPENDIX A

A NOTE ON THE MORE GENERAL PROBLEM OF VARIABILITY IN CONSUMER BEHAVIOR

At the beginning of the second chapter, the economic significance of the flexibility (or inflexibility) of saving was briefly considered. To Keynes, consumption was a passive factor which was determined by the level of income while investment was autonomous. He placed the responsibility for the instability of the economy ultimately on the instability of investment. On the other hand, in the last decade, belief in the autonomy of consumer expenditure has grown.[1] The author has pointed out at the beginning of the second chapter that if investment changes while saving is equally flexible in the same direction, aggregate demand will be maintained. The division of total consumer saving into contractual (habitual, or relatively fixed) saving and discretionary (and hence, variable) saving is helpful in explaining variability of total consumer saving over time. In the third chapter, we concerned ourselves with the problem of investigating the flexibility (or lack of flexibility) of contractual saving over two years. This is but one part of the more general question of flexibility of consumer behavior. Just as consumer saving can be divided into fixed (or

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[1] Indeed, such a belief is one of the foundation stones of the Economic Behavior Program of the Survey Research Center of the University of Michigan.

habitual) components whose occurrence and magnitude depends upon deliberate choice, so too can the spending side of the consumer's budget. If habitual spending and saving is relatively fixed, then an important question for the theory of business fluctuations is how outlays of choice are divided from period to period as between discretionary saving and discretionary spending. This is the crux of the autonomy of consumer economic behavior. The accompanying classification of consumer outlays is that of Professor George Katona.[1]

	SPENDING	SAVING
Habitual outlays	Food, certain clothing items, interest, taxes, etc.	Life insurance premiums, payments into retirement funds, repayment of debt, etc.
Outlays of choice (Variable)	Durable goods, repairs of houses, vacation trips, luxury expenditures, many services	Additions to liquid assets, investments in securities and real estate, etc.

The division of consumer outlays between habitual ones and outlays of choice increases in importance as the income level of the economy increases. As the income level rises, (1) a smaller portion of it is required for the necessaries of life, and (2) expenditures on non-essential durable goods increases. Purchases of the latter are postponable and require deliberate choice. In addition, factors which permit spending in excess of income may accentuate the problem of variation in consumer spending over time. The two

[1] George Katona, "Variability of Consumer Behavior and the Survey Method," Contributions of Survey Methods to Economics, ed. by Lawrence R. Klein (New York: Columbia University Press, 1954), p. 51.

most important are (1) facilities for consumer borrowing, and (2) the possession of liquid assets.

Mr. Katona lists three sets of factors which may influence the consumer choice between supernumerary spending and supernumerary saving over the short term: (1) income expectations and economic outlook, (2) perceptions of past price changes and price expectations, and (3) the inventory situation. Expectation of income increases in the near future, a feeling of security, and optimism regarding the business cycle are likely to stimulate spending; contrary attitudes tend to have the opposite effect. Anticipation of sharp price increases as well as of shortages may stimulate spending, while dissatisfaction with past increases and expectation of the leveling of prices may retard spending. A reduction in consumers' inventories of durable goods (e.g., as caused by wartime reallocation of resources) will encourage spending; at the opposite pole, it is conceivable, but not necessarily likely, that consumers may become saturated with consumer durable goods. For empirical work regarding the first two sets of factors, the reader can refer to Consumer Attitudes and Demand, 1950-1952.[1]

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[1]George Katona and Eva Mueller, Consumer Attitudes and Demand, 1950-1952, (Ann Arbor: Survey Research Center, 1953).

APPENDIX B

THE PERCENTAGE OF TOTAL VARIANCE EXPLAINED BY THE INDEPENDENT VARIABLES

The "importance" of an explanatory variable in a multivariate relationship can have two different meanings. In Chapter 4, when we inquired into the significance of a variable, we investigated whether its coefficient was at least twice its sampling error. In this appendix, we shall use "significance" in the same sense. A second question can be investigated: How much of the total variance is explained by each of the independent variables? In Table 25, the answer to this question is provided for equation 1 (disposable income of $700-$2899) and for equation 10 (disposable income of $2900-$999). In each of these equations, the dependent variable is the dollar amount of contractual saving for all spending units in the respective income bands regardless of whether that amount is positive or zero.

An insignificant variable can, in some cases, explain a higher percentage of variance than one which is significant. This is true when the latter variable separates the population on the basis of a characteristic which only a small portion of the population possesses. For example, in the high income group race is significant but veteran status is not; nevertheless, the percentage of variance which veteran status explains is higher than the percentage which race explains. The Negroes have a higher level of

TABLE 25

PERCENTAGE OF TOTAL VARIANCE IN AMOUNT OF CONTRACTUAL SAVING EXPLAINED BY EACH INDEPENDENT VARIABLE IN EQUATIONS 1 AND 10

Variable	Equation 1 Income $700-2899	Equation 10 Income $2900-9999
Race	0.218%	0.280%
Age	.115	2.082
Veteran status	.260	.064
Education	.978	1.218
Disposable income	10.271	6.457
Community size	.004	.005
Number of income receivers	.071	.039
Marital status and children	1.872	1.998
Income change	.008	.008
	13.797%	12.151%
	R = .372	R = .349

contractual saving but they comprise only a very small portion of the high income group. The three variables which explain the most variance, disposable income, marital status and children, and education, are also significant. Of these, disposable income is the only one which explains a considerable amount of variance, 10.2 per cent.

In the low income group, the four variables which explain the most variance are also significant. Disposable income explains less variance than in the high income group but age, marital status and children, and education all explain more.

The coefficient of correlation for the high income group is .372 and for the low income group is .349. Correlation coefficients

of this range of magnitude are quite common in analyzing cross section data. To those statisticians who have only worked with aggregative data, these coefficients would seem low. If we had simply related the mean contractual saving for various income groups with the mean incomes, a much higher correlation coefficient could have been obtained. The closeness of such means to the regression line would hide great individual variability among different spending units at a given income level.

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