2.0 CONSUMPTION AND SAVING

This chapter presents the income concepts used in the analysis of consumption and saving behavior, It begins with the early concept of current disposable income used in studies of consumption and traces the evolution of more complex theories of consumer behavior, and the broadening of the income concept which is required to implement and test these theories empirically. This broadening has two dimensions: increasing the transactions included in the income measures, and lengthening the accounting period.

2.1 The Concept of Income in the Consumption Function

Serious examination of the nature of the decision to allocate income among consumption and saving was stimulated by the publication of John Maynard, Keynes' General Theory (1936/1965).[1] Although Keynes' theory dealt with the determination of aggregate effective demand and national income, his characterization of the properties of the consumption function:

> men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as their income increases (Keynes, 1936, p. 96)

found use in empirical studies both of aggregate and individual consumption behavior.

The appropriate income variable has come to be accepted as identifiable with' disposable personal income.. This may be defined as the value of resources' realized by the decision unit, which are freely disposable, during a definite period of time. Several points need clarification in this definition.' First, "value of resources" implies that a money equivalent can be established for income provided in some other fashion. "Realized" implies that timing of receipts is important. The decision unit remains to be specified. "Disposable" has been interpreted to mean that the decision unit is capable of exercising control *over* its allocation. Thus, illiquid gifts and transfers, as well as taxes, would normally be excluded. Finally, it remains to specify the "definite period of time."

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[1] This chapter draws heavily on two excellent review articles. Robert Ferber (1973) not only reviews the theory of *consumer* behavior, but also touches on its extensions into other analytic areas, such as labor analysis, home production, fertility and human capital. An earlier article by Daniel Suits (1964) provides a more extended discussion of development in the 1940s and 1950s.

The Decision Unit

The decision unit, for purposes of consumption analysis, is that group of individuals, who either collectively or by delegation of responsibility to one or more members, jointly determine the allocation of income between consumption and saving. Obviously, the concept of a fixed unit cannot be defended against penetrating criticism. As Kolm remarks,

> Every biological individual is the center of concentric circles of other individuals who are more or less directly concerned by, and participating in, 'his' choices. (Kolm, 1976, p. 383)

This idea of a continuum of responsible individuals, in which consumption decisions are made sometimes individually, sometimes by the adult members of, a nuclear family, sometimes by all family members, and sometimes by society at large through the political process, represents reality. However, it is not difficult to propose certain simple tests to provide an approximate definition of the "consuming unit." Central to these tests is the isolation of those individuals for whom expenditure on food and shelter is jointly determined and who lack independent means to purchase separately these and other major consumption items. As an example of this, the Consumer Expenditure Survey defined the consumer unit in the following manner. First, the head of the household, his spouse (if any), and all never married children of the head living within the household are classified as belonging to the primary consuming unit. For all other individuals in the household, questions are asked to determine whether they pay privately for (1) food, (2) shelter, and (3) clothing. If the answer is yes for two of the above three classes of expenditures, they are considered a separate consuming unit, and are not grouped with the primary consuming unit for further survey purposes.[1] Whether this set of criteria provides an adequate definition of the consuming unit is not established. In certain cases, individuals who do not reside in the household (college students and elderly parents in nursing homes, for instance) should probably be included in the basic consuming unit, if they are totally dependent on the primary household head(s) for support, and if

[1] If questioning reveals that they do share expenses with some other individual in the household (not a member of the primary consuming unit), these individuals would be combined to form a second consuming unit.

the decisions on their basic sustenance (food and shelter) are not subject to their control.

Accounting Period

Disposable income is usually thought of as a current measure. Formally, the accounting period should correspond to the "expenditure cycle," which is to say the periodicity with which major recurrent purchases (of nondurable goods or services) are transacted. Unfortunately, this periodicity of purchase differs both among goods and among individuals. In order to make a clear conceptual distinction between disposable income and permanent income, it is useful to stress that the former is thought of as using a short accounting period. Certainly the accounting period should be no longer than a year, and may be as short as a week.

Component Definition of Disposable Personal Income

Income is a primitive concept, which predates modern economics. Definitions of disposable personal income do exist, although it is surprising how many elementary economics textbooks manage to avoid defining it. Among the definitions which are quoted most widely are the following:

> the money value of the net accretion to one's economic power between two points of time. (Haig, 1921, p. 26)

> Personal income may be defined as the algebraic sum of (1) the market value of rights exercised in consumption and (2) the change in the value of the store of property rights between the beginning and end of the period in question. (Simon, 1938, p. 50)

> Income may be considered to be the maximum that could be consumed in a given period consistent with the maintenance of wealth or of income potential. (Bailey, 1962, p. 270)

Unfortunately, these definitions are silent on a number of issues that must be resolved in developing an operational definition of personal income. Also, they offer little guidance for dealing with the large number of specific issues that arise in attempting to measure the components of income such as problems in valuing in-kind sources of income.

The definition of personal income for a consuming unit which is presented in Table 2-1 differs in some details from the definition of aggregate personal income presented in Chapter 6. These differences arise chiefly from attempts made by the Bureau of Economic Analysis to broaden the personal income concept by including certain non-market transactions.

For most units, personal income till consist primarily of earnings received in the form of cash. Thus all forms of cash caupensation of employees (wages, salaries, tips, bonuses, etc.), as well as the net income of self-employed proprietors and farmers, form the base of personal income. To this must be added all cash transfers from any source outside the consuming unit, which includes assistance from government, gifts, bequests, income from a trust, alimony and child support payments.

Also included is cash income from the assets owned or controlled by the recipient unit. Thus interest, dividends, royalties, realized capital gains from the sale of property (less losses), receipts from a pension or annuity, and interest included in proceeds from life insurance (owned by the consuming unit) al.1 contribute to expansion of the budget constraint determining potential expenditure.

During any period, the consuming unit may (and often does) choose to spend more than its "income," It is free to finance the excess by liquidating a portion of its assets or by incurring a liability. In either case, it reduces its wealth. Certain of the transactions discussed above will or will not be considered income within the accounting period, depending on whether the accounting system is based on an accretion or a realization basis (i.e., whether accrual or cash accounting is used. The discussion above implicitly adopts a cash accounting basis. Under the alternative accrual accounting system, such transactions as the surrender of a life insurance policy for cash would not be an event affecting income in the current period, since the gain associated with the interest implicitly reflected in the increase of cash value over and above premium payments would have been recognized in income as it accrued. Similarly, the receipt of a pension to which the consuming unit is legally entitled would not be considered income, i.e., "gain," since the gain would have been previously reflected in income each

TABLE 2-1

DISPOSABLE PERSONAL INCOME
UNIT OF ANALYSIS: CONSUMING UNIT
ACCOUNTING PERIOD: ANNUAL

INCOME

A.	Labor Income
A.1	Civilian Wages
A.2	Civilian Salaries
A.3	Tips and Gratuities
A.4	Honoraria and Awards
A S	Sick Pay
A.6	WIN Payments
A.7	Active Military Pay--Nonhazardous
A.8	Active Military Pay--Hazardous Duty
A.9	Military Reserve Pay
B.	Business Income
B.1	Net Income from Business Proprietorship
B.2	Net Income from Business Partnership
B.3	Net Income from Farm Proprietorship
8.4	Net Income from Faxm Partnership
B.6	Gambling Winnings or Losses
c.	Property Income
c.1	Interest
c.2	Dividends
c.3	Net Income from Rental Property
c.4	Royalties
C.5	Realized Capital Gains or Losses
c.9	Receipts from Private Pension Plan
C.10	Receipts from Public Pension Plan
C.11	Income from a Trust
D.	Public Cash Transfer Payments
D.1	Social Security Retirement Benefits
D.2	Social Security Disability Benefits
0.3	Social Security Survivor's Benefits
0.4	Railroad Retirement Benefits
D.5	Unemployment Benefits
D.6	Workmen's Compensation Payments
D.7	Veteran's Disability Pension--Service Connected
D.8	Veteran's Disability Pension--Nonservice Connected
D.9	Pension for Survivors of Veterans
D.10	Veteran's Educational Benefits
D.11	Aid to Families with Dependent Children
D.12	Supplemental Security Income
D.13	General Assistance
D.14	Other Public Assistance

E. Public In-kind Transfers

None

F. Private Transfers in Cash and in Kind

F.1 Alimony and Child Support Receipts
F.2 Gifts (In Cash)
F.3 Bequests (In Cash)
F.4 Damages (Net of Associated Costs)
F.5 Scholarships and Fellowships
F.7 Prizes and Awards (In Cash)
F.8 Support Provided by Others (In Cash)
F.9 Proceeds from Life Insurance

EXPENDITURES

G.14 Federal Income Taxes
G.15 F.I.C.A. Taxes
G.16 State Income Taxes
G.17 Local Wage or Income Taxes

period as the value of accumulated, vested pension rights increased.'

2.2 Modern Extensions of Consumption Theory

The above concept of disposable income was accepted for a number of years. However, around the end of World War II, new data became available which provided evidence of the defects of using current disposable income to explain consumption behavior. Simon Kuznets (1946) published the results of his laborious estimation of aggregate income and consumption since 1869. In addition, survey data on individual income, consumption and wealth became available through the efforts of the Federal Reserve Board. These studies presented three major findings which were incompatible with the predictions of the absolute income hypothesis.

First, Kuznets' data showed that the average propensity to consume, averaged over long periods, had remained constant over the span of his data, notwithstanding the enormous growth in average income which had occurred. The absolute income hypothesis would have predicted it to fall. Second, Kuznets' data showed that the average propensity to consume rises in recessions and declines during expansions. Last, the survey data revealed that individuals' average propensity to consume declines strikingly as one moves up the income ladder. This finding was apparently inconsistent with the first finding above.

New theories of consumption emerged which were consistent with the empirical data. Of these, most influential on future analysis of consumption were the relative income hypothesis, the life cycle hypothesis, and the permanent income hypothesis.

Relative Income Hypothesis

The first challenge to the absolute income hypothesis came from Dorothy Brady and Rose Friedman (19471, who suggested that the average propensity to consume depended not on the absolute income of the recipient, but on his or her income relative to the average income of the population. This theory was elaborated by Dusenberry (1949), who suggested that the relative

[1] An excellent discussion of these and other differences occasioned by moving from an accrual to a cash basis is contained in Andrews (1974) which is discussed in "Realization Based Taxable Income Concept," Section 4.3.

income theory might help explain certain anomalies in the consumption behavior of blacks and whites. At every income level, blacks spent less on average than whites of equivalent income. The relative income hypothesis explains this by noting that blacks' average income is lower. Thus a black individual with a given income has a higher relative income (compared to his community or referent group) than a white.

Applied to aggregate time series data, the relative income theory has a habit persistence interpretation. Faced with a decline in income, consumers attempt to maintain their previous level of consumption, thereby increasing their average propensity to consume. This prediction is consistent with the second finding of Kuznets, that the APC rises during recessions and falls during expansions.

The relative income hypothesis succumbed quickly to alternative explanations which expanded the set of explanatory variables. Tobin (1951), for example, pointed out that the saving behavior of blacks could be explained more simply by their lower wealth holdings at each income level. In doing so, he anticipated the "life cycle hypothesis" argument.

No operational distinction in the definition of income was made in the relative income hypothesis. Current personal disposable income remained the appropriate income variable.

Life Cycle Hypothesis of Saving and Consumption Behavior

An innovative concept which has influenced modern consumption analysis is the "life cycle hypothesis" of saving and consumption. The potential value of the classification of an individual's life into stages (such as childhood, maturation and family formation, early child-bearing years, later working life, retirement, etc.) is a concept drawn from sociology (where it is attributed to Glick (1947)). The implications of the life cycle for economic behavior were discussed by Modigliani and Brumberg (1954), Lydall (1955), and Lansing and Kish (1957). The contribution of these authors is to focus attention on the process of wealth accumulation and decumulation over the adult stages of the life cycle. At any given age, both income and wealth will determine the desired level of consumption and saving. Thus, during the early years of adulthood, the individual borrows in order to acquire

assets (homes, automobiles, furnishings) which provide consumption services. As income increases and current needs fall or remain stable, these debts are liquidated and wealth is accumulated (chiefly in terms of claims on public and private retirement funds). During retirement, this wealth is liquidated to maintain consumption levels while income is reduced or eliminated.

More formally, the life cycle hypothesis postulates that current consumption is a function of lifetime income, or its current wealth equivalent. Wealth is held in two forms--tangible capital assets (consumer durables and financial claims on corporate assets) and human capital. (the ability to earn income). As operationalized by Ando and Modigliani (1963), the hypothesis takes the form

$$(2) \quad C_t = f(E_t, \bar{E}_t, W_t)$$

where C_t is current consumption expenditure
E_t is current earnings
$\bar{E}_t$ is expected future earnings
W_t is current tangible wealth

This form was adopted to make best use of the data then available. Earnings (E_t) represent the return on current human capital. Expected earnings ($\bar{E}_t$) are a function of the individual's age, current earnings, educational attainment, and other specific factors, such as a disabling condition. Current wealth (W_t) is used in preference to current income from assets since many asset holdings, such as a home, do not yield a current money return, but do provide consumptive services.

The life cycle *income* concept requires changes in the definition of both income and consumption. From consumer expenditure as *normally* defined must be subtracted any purchases of durable assets. These conceptually represent investment in capital which yields a return in the form of services. The value of these services derived from the ownership of consumer durables must, however, be added to consumption expenditures. Table 2-2 summarizes the data required to implement the life cycle concept.

Tests of the theory require data on earnings, that is to say, labor income and business income. Conceptual difficulties are presented by the latter item, since available data do not distinguish between that portion of the

TABLE 2-2

LIFE CYCLE INCOME AND WEALTH CONCEPTS
UNIT OF ANALYSIS: CONSUMING UNIT
ACCOUNTING PERIOD: LIFE TIME

INCOME

A.	**Labor** Income
A.1	Civilian Wages
A.2	Civilian Salaries
A.3	Tips and Gratuities
A.5	Sick Pay
A.7	Active Military Pay-Nonhazardous Duty
A.0	Active Military Pay-Hazardous Duty
A.9	Military Reserve Pay
B.	Business Income
B.1	Net Income from Business Proprietorship
B.2	Net Income from Business Partnership
B.3	Net Income from Farm Proprietorship
B.4	Net Income from Farm Partnership
C.	Property Income
	None
D.	Public Cash Transfer Payments
D.1	Social Security Retirement Benefits
0.2	Social Security Disability Benefits
D.3	Social Security Survivor's Benefits
D.4	Railroad Retirement Benefits
D.5	Unemployment Benefits
D.6	workmen's Compensation Payments
D.7	Veteran's Disability Pension--Service Connected
D.8	Veteran's Disability Pension--Nonservice Connected
D.9	Pensions for Survivors of Veterans
D.10	Veteran's Educational Benefits
D.11	Aid to Families with Dependent Children
D.12	Supplemental Security Income
D.13	General Assistance
D.14	Other Public Assistance
E.	Public In-kind Transfers
	None

F. Private Transfers in Cash and In Kind

F.1 Alimony and Child Support Receipts
F.2 Gifts
F.3 Bequests
F.4 Damages (Net of Associated Costs)
F.5 Scholarships and Fellowships
F.7 Prizes and Awards
F.8 Support Provided by Others

EXPENDITURES

G.14 Federal Income Taxes
G.lS F.I.C.A. Taxes
6.16 State Income Taxes
G.17 Local Wage or Income Taxes

ASSETS AND LIABILITIES

H. Assets

H.l Value of Home
H.2 Value of Home Furnishings
H.3 Value of Vehicle(s)
H.4 Value of Business Property
H.5 Value of Farm or Ranch
ii.6 Value of Other Real Property
H.7 'Value of Other Personal Property
H.8 Bonds
Ii.9 Securities
H.10 Checking Accounts
H.ll Savings Accounts
H.12 Cash Value of Life Insurance
H.13 Loans Owed by Individuals
H.14 *Present* Value of Pension Rights
H.15 Other Amounts Due

J. Liabilities

J.l Mortgage Debt on Home
J.2 Installment Credit Debt
J.3 Outstanding Debt on Car Loan
5.4 Debt Secured by Business Property
J.5 Mortgage Debt on Farm or Ranch
5.6 Mortgage Debt on Other Real Property
5.7 Debt to Brokers or *Dealers*
5.8 Personal Loan Balance Outstanding
J.9 Amount Owed to Other Individuals
J.lO Other Amounts Payable

income of a self-employed proprietor or farmer which represents a return on his time a& talent (i.e., earnings) and that portion which represents a return on the capital invested in his business. Cash transfer payments have also been included by those who use this concept in their empirical work. In addition, the theory requires that information on wealth holdings (assets and liabilities) be available, and also requires data on life cycle status (age, marital status, size of family) and variables which impact expected future earnings (education, retirement plan coverage, occupation, etc.).'

The life cycle hypothesis has proved extremely fruitful to empirical students of consumption, and continues to be one of the two main pillars of modern consumption theory. Discussion of'refinements to the theory will be deferred until after the presentation of the *other main* pillar: the permanent income hypothesis.

Permanent Income Hypothesis.

Milton Friedman (1957) presents a theory of consumption and saving behavior which offers an alternative explanation of the behavioral phenomena explained by the life cycle theory. Friedman points out that the horizon' for consumption decisions planning may be *longer than the* periodicity of income receipt. (At the extreme, this is obvious, since a person does not plan his expenditures for a day *on the* basis of that day's income receipts). Since most income data then available were annual, Friedman's criticism of current theory may be stated that annual income is not the best predictor of annual consumption, and that a better explanation of current consumption may be permanent income. Friedman posits that current (annual) income consists of apermanentanda transitorycomponent. Similarly, current consumption may be decomposed into permanent and transitory components.

As interpreted by empirical studies, the transitory and permanent components of current income cannot be identified with any particular sources of income. Thus the difference between current and permanent income must lie in the accounting period.[1]

[1] Since the distinction between disposable income and permanent income lies in the accounting period, a detailed component description is not presented.

The near simultaneous emergence of two major theories of consumer behavior,' both broadly consistent with existing evidence on consumption behavior, both rich in offering several testable predictions subject to verification or falsification, produced a substantial literature of empirical studies designed to test one *or the other theory*, and to seek to distinguish the "better" model. Existing data were not well suited to this task, and researchers exhibited considerable ingenuity in seeking ways to test the hypothesis in a rigorous and defensible manner.

Mayer (1972) reviews many of these studies, as well as presenting his own statistical findings. Mayer notes that the use of cross-section budget data on households to test the permanent income and life cycle theories of consumption is difficult. In particular, both consumption and income measures which are available are seriously at variance with the theoretical constructs. Two sorts of data are available: (1) saving studies such as the Survey of Financial Characteristics of Consumers (SFCC) (which provides data on saving and income, yielding consumption estimates by subtraction of income from saving) and (2) budget data such as the Consumer Expenditure Survey (CES) (which provides data on consumption and income, yielding saving estimates by subtraction of consumption from income). The first method can lead to upward bias in estimates of income elasticity, since measurement errors in income are also incorporated into consumption. In addition, consumption data include purchases of durable goods, not the value of services provided by durable assets. Saving data do not include accrued gains on stocks and real property, which is also excluded from reported income. Income data typically include receipts from pensions and life insurance policies, but exclude interest accruing on life insurance policies and all forms of employer compensation other than cash wages and salaries.

An early test of the permanent income theory was presented by Ronald Bodkin (1959). A windfall (an unexpected receipt of income) represents transitory income in its purest form: it should therefore not be reflected *in* current consumption. Bird and Bodkin (1965) and Kreinin (1961) also presented

evidence on the behavior of families which received a windfall income--a veteran's insurance dividend and restitution payments by the German government to Israelis, respectively. These findings offer mixed results. Kreinin, in particular, found substantial spending for ordinary consumption items (not durable goods) out of the windfall income. These results cast doubt on the life cycle income hypothesis as well as the permanent income hypothesis. Although windfall income adds to wealth, the established propensity to spend from wealth is extremely low (0.02-0.04 by most studies); therefore most windfall income would be predicted to be saved.

A second strong prediction of the permanent income hypothesis is that the elasticity of consumption with respect to permanent income is unity (i.e., that increases in permanent income lead to equiproportionate increases in consumption). While aggregate studies yielded some support for this proposition, Friend and Kravis (1957) found that the elasticity varied with the average income of the occupational group to which the household head belonged. Friend and Taubman (1966) have suggested the substitution of the concept of normal income (a weighted average of current and past income) for permanent income. Their proposal amounts to a simple extension of the accounting period for income, without making any assumptions concerning the theoretical properties of transitory and normal (permanent) income.

2.3 Impact of Wealth on Consumption

A major focus of many students of consumer behavior has been the impact of wealth on consumption. While many of these studies represent explicit tests of the life cycle hypothesis, others predate the theory and deal more generally with the influence of wealth.

Studies of the Impact of Total Wealth (Net Worth)

Evans (1967) examined many different specifications of the consumption function with wealth included. He found mixed results for aggregate time series data from the National Accounts, with wealth important in long run studies which include pre-World War If data, but not in the post-war period. Using data on individual families from the Survey of Finance Characteristics of Consumers, Projector (1968) found that net worth affects consumption, but not in a manner entirely consistent with the life cycle theory. She

found the fraction of net worth spent for consumption was highest for families in the 35-44 age group. The life cycle theory suggests that the fraction would increase monotonically with age of household head. Ando and Modigliani (1963), as well as Projector, find the coefficient on wealth to be small.

2.4 Allocation of saving Among Financial and Real Assets

Theories of consumption are concerned primarily with the allocation of total income between saving and consumption. A related question which has occupied much professional attention is the allocation of saving among financial and real assets. This decision may be characterized as choosing to hold wealth in the form of money, other financial assets, and real assets.

Friend and Schor (1959) presented important evidence on this question based on the 1950 Survey of Consumer Expenditures. A more recent study by Crockett and Friend (1967) based on the Survey of Financial Characteristics of Consumers found that the long run income elasticity of net worth and the short run income elasticity of saving are substantially greater than one. Initial wealth and age seemed to be the prime determinants of current wealth with income playing a secondary role. More complete data from the same survey led Projector and Weiss (1966) to the same conclusion. Rasche (1972) tested the saving function of the life cycle hypothesis, explicitly including the age and expected lifetime of adult family members, using SFCC data. His findings supported the Ando-Modigliani results.

Studies of the Demand for Money

The financial literature is filled with studies which use income to explain the demand for money. Excellent summaries exist in the article by Meltzer (1963), Cagan's monograph (Cagan, 1965), and the textbook by Laidler (1969). Most studies have adopted the permanent income concept as appropriate. "Laidler concludes that the demand for money is affected by mostly short-term rates of interest and by wealth (or permanent income) rather than current income." (Ferber, 1973, p. 1320)

For examples of sane innovative current work on the demand for money, see the article by Goldfeld (1973), and Karni's (1973) attempt to incorporate the value of time into Baumol's (1952) inventory model of money demand.

Relation of Personal and Institutional Saving

In recent years, M.S. Feldstein and others have contributed to the understanding of the impact of institutional saving on personal saving and investment. Institutional savings means the accumulation of wealth through (1) earnings retained and reinvested by corporations; (2) private pension and retirement plan contributions by employers and employees; and (3) accrual of benefit rights in public retirement systems (Social Security, federal and state government retirement systems). It was not widely appreciated that the significant growth in institutional saving (which is not included in personal disposable income) should be expected to have a significant displacement effect on private saving out of current income. Feldstein (1973) discusses this effect, and the tax incentives which favor institutional over personal saving. The argument is tested empirically by Feldstein and Fane (1973). The impact of the Social Security System is examined in Feldstein (1974). Alicia Munnell (1974) discusses the impact of Social Security on personal Saving. A more recent study by Munnell (1976) presents evidence on the relationship of private pension rights on personal savings. All of these studies, and other ongoing work in this area, are summarized and commented on by Feldstein (1976).

These studies, as well as *others* by Darby (1972) and Diewart (1974), indicate the major interest in pursuing studies of the allocation of savings. Often data sources will provide most but not all of the data required. To summarize the major criticisms voiced by those trying to empirically test theories of savings, an ideal data base would contain data needed to construct disposable income (labor income, business income, property income, transfer income, and taxes paid), aggregate consumption of nondurable goods and services, purchases of specific durable goods (homes, cars, furniture, and appliances), saving data (accumulation of liquid assets such as bank and saving deposits, stocks and bonds, etc.), and demographic data on family size and canpositon, education, and occupation of adults. Particular attention should be paid to the collection of data often omitted from a survey, such as employer and employee contributions to a pension plan, realized and unrealized capital gains, and accrued interest in life insurance policies.

2.5 Dynamic Models of Consumer Behavior

The lag in response of consumption to income changes has been among the paramount questions for aggregate consumption studies. This is most true for studies of the demand for individual items or classes of consumption and in particular for durable goods. Econometric models have developed increasing elaborate formulations of the lag structure in an attempt to improve forecasting accuracy (see Griliches (1967) for a survey of distributed lag models).

Habit Persistance Models

Brown (1952) introduced the concept of the habit persistance model, and stressed its role in reconciling differences between short run (time series) and long run (cross section) propensities to spend as income varied. An elegant presentation of the habit persistance model is found in Pollak (1970). Pollak argues that there are three reasons why long and short run demand functions might differ:

> (1) fixed commitments by consumer that prevent adjustment of consumption; (2) consumer ignorance as to consumption possibilities or *tastes;* and (3) goods may be "habit-forming" so that an individual's current preferences depend on his past consumption patterns. (Pollak, 1970, p. 745)

In the habit persistance model, current consumption is a positive function of income and past consumption of the good or service, and a negative function of past consumption of all other goods. Such a specification has proved successful in the prediction of consumption of many types of perishable goods and services.

Stock Adjustment Model

As mentioned above, the purchase of a car, a home, or major appliances and furniture is not consumption, but rather investment in an asset which will yield consumable services in the future. It is not surprising, then, that stock adjustment models, originally developed in the theory of corporate capital investment, have proved valuable in the explanation of spending for consumer durables. The stock adjustment model posits a desired stock of the

good in question, which is a function of income and other taste variables. Actual spending then is a fraction of the difference between desired and actual stock. The higher the fraction, the more rapid the adjustment to desired stock. These models have found their greatest success in predicting automobile sales, but have also been used for numerous other durable goods.

Dynamic Demand Model

Balestra and Nerlove (1967) in their study of the natural gas market introduce a new dynamic structure. They postulate that the d-d for gas is extremely price inelastic in the short run because the stock of gas using appliances is fixed. The stock was determined based on an expectation of current price. These expectations, in turn, depend on the history of past prices. The combination of the demand function and price expectation function generates a dynamic demand function, where current consumption depends on past prices and consumption.

Houthakker and Taylor (1970) estimated demand functions for almost one hundred categories of consumer spending. Their specification combined the habit persistance and stock adjustment theories, allowing the estimation to resolve the model for each specific good or services.

The above studies have chiefly been performed on time series data, because adequate data for individual units have been unavailable. If a survey data is to be used to estimate a dynamic model, it should be longitudinal. Several years worth of observations on consumption may be required to adequately estimate the response pattern. In addition, asset data which can support the measurement of the initial stock of each durable item (cars, houses, etc) must be collected.

2.6 Extensions of Consumer Demand Theory: Current and Future Trends

To date, most students of consumer behavior have been forced to accept the conventional definitions of personal consumption expenditure, personal disposable income, and personal saving. Debate has centered on the appropriate horizon of measurement (annual income versus permanent income versus life cycle income). Little attention has been focused on the appropriate definition of the spending unit. The growing importance of financial intermediaries and government in determining both saving and consumption (see

Feldstein above on saving and the discussion of in-kind transfers in Chapter 4), may require modification of the definition of income, consumption, and saving.

Increasingly, consumption studies will be forced to recognize the role of time in consumer behavior. This has two dimensions: first, the spending unit must allocate both income andtimeto satisfy its wants andneeds. As time becomes more valuable through growth in per capita earnings', goods may be substituted for time (Becker, 1965). Secondly, all consumption represents the combination of goods and time inputs to supply consumption services (Lancaster, 1971). This *work* has major implications for the study of home production and is discussed in the next chapter.

2.7 Summary: Data Requirements in the Area of Consumption and Saving Behavior

The concept of income used in consumption studies has evolved from a simple current cash income concept which is measured after taxes toward a focus on the allocation of consumption and saving over the lifetime of the recipient unit. Thus the major thrust of *work in* this area has been to extend the accounting period for income. Theoretical concern has focused on the appropriate means to integrate the influence of current income and wealth on consumption. Efforts to broaden the income concept by including more sources of income which have emerged in other analytic areas have found little acceptance in consumption studies.

The majority of empirical studies of consumption behavior have been based on aggregate time series data from the National Income and Product Accounts. The most important source of individual cross section data on consumption and saving is the Consumer Expenditure Survey, the only comprehensive source of data on outlays for individual items of consumption'by consuming units. The Surveys of Consumer Finances, Survey of Financial Characteristics of Consumers and other scattered savings studies do provide a basis for estimating total consumption or saving behavior, but do not attempt to include data on all individual consumption categories.

Critics of these studies have focused on deficiencies of the income concept which involve (a) omitted transactions, (b) accounting periods, and (c) inappropriate unit of analysis. Often noted is the failure to measure both

realized and accrued capital gains. Purchases of consumer durables are often included in consumption; what is actually needed is data on stocks of durable assets, including date of purchase and estimates of their depreciated value, from which estimates of the flow of services from the assets may be calculated.

Budget studies are so expensive that they rarely span multiyear periods. Analysts recognize that one or two years of income data are insufficient to accurately measure permanent income, and attempt to correct statistically for the error of measurement thus generated. Ideally, survey efforts would follow the same panel for five to ten years; however, the two recent studies which do so, the Panel Study of Income Dynamics and the National Longitudinal Survey, are of limited use for consumption studies due to the failure to measure many categories of consumption expenditures.

The Consumer Expenditure Survey makes a serious attempt to define a consuming unit appropriately. It carefully notes the composition of the unit over the survey period, and adjusts income and consumption data for individuals who enter or leave the unit. This procedure should certainly be used in future survey efforts; in addition, more attention should be paid to individuals outside the survey household (ex-spouses, children in college, elderly parents in resthomes, etc.) whose welfare and spending decisions may be interconnected to the analytic unit.

Not yet to be found in existing surveys are the data needed to investigate the technology of production of home services. Existing consumption studies measure purchases of goods which are actually inputs to the process of producing consumptive services. This is true not only of durable goods, but of most non-durable goods . . The data needed to support such a study are discussed in Section 3.6.

Ando, A. and Modigliani, F. (1963). 'The life cycle hypothesis of saving: aggregate implications and tests,' American Economic Review, volume 53, pp. 55-84.

Andrews, W.D. (1974). 'A consumption-type or cash flow personal income tax,' Harvard Law Review, volume 87, no. 6, pp. 1113-1187.

Arena, J.J. (1963). "The wealth effect and consumption: a statistical inquiry,' Yale Economic Essays, volume 3, pp. 251-303.

Arena, J.J. (1964). 'Capital gains and the 'life cycle' hypothesis of saving,' American Economic Review, volume 54, pp. 107-111.

Arena, J.J. (1965). 'Postwar stock market changes and consumer spending,' Review of Economics and Statistics, volume 47, pp. 379-391.

Atkinson, A.B. (1971). 'The distribution of wealth and the individual life-cycle,' Oxford Economic Papers, volume 23, pp. 239-254.

Bailey, M.J. (1962). National income and the price level, New York, McGraw-Hill Publishing Company.

Balestra, P. and Nerlove, M. (1967). Demand for natural gas in the United States, Amsterdam, North Holland Publishing Company.

Baumol, W.J. (1952). 'The transactions demand for cash: an inventory theoretic approach,' Quarterly Journal of Economics, volume 66, no. 4, pp. 545-556.

Becker, G.S. (1965). 'A theory of the allocation of time,' Economic Journal, volume 75, pp. 493-517.

Bhatia, K.B. (1972). 'Capital gains and the aggregate consumption function,' American Economic Review, volume 62, no. 5, pp. 866-879.

Bird, R.C. and Bodkin, R.G. (1965). 'The National Service Life Insurance dividends of 1950 and consumption: a further test of the 'strict' permanent-income hypothesis,' Journal of Political Economy, volume 73, pp. 499-515.

Bodkin, R. (1959). 'Windfall income and consumption,' American Economic Review, volume 49, pp. 602614.

Brady, D.S. and Friedman, R.D. (1947). 'Savings and the income distribution,' Studies in income and wealth, volume 10, New York, National Bureau of Economic Research.

Brown, T.M. (1952). 'Habit persistance and lags in consumer behavior,' Econometrica, volume 20, pp. 355-371.

Cagan, P. (1965). Determinants and effects of changes in the stock of money, 1875-1960, New York, National Bureau of Economic Research.

Clarkson, K. (1976). 'Welfare benefits of the Food Stamp program,' Southern Economic Journal, volume 43, no. 1, pp. 864-878.

Crockett, J. and Friend, I. (1967). 'Consumer investment behavior,' in Determinants of investment behavior, (Ferber, R., ed.), New York National Bureau of Economic Research.

Darby, M.R. (1972). *Allocation of transitory income among consumers assets,' American Economic Review, volume 62, no. 5, pp.. 929-941.

David, P.A. and Scadding, J.L. (1974). 'Private savings - ultrarationality, aggregation and Denison's law,' Journal of Political Economy, volume 82, no. 2, pp. 225-249.

Diewart, W.E. (1974). 'Consumer theory and demand for durables,' Econometrica, volume 42, pp. 497-516.

Duesenberry, J. (1949). Income, saving, and the theory of consumer behavior, Cambridge, Mass., Harvard University Press.

Evans, M.K. (1967). 'The importance of wealth in the consumption function,' Journal of Political Economy, volume 75, pp. 335-351.

Feldstein, M.S. (1973). 'Tax incentives, saving, and capital accumulation in the United States,' Journal of Public Economics, volume 2, pp. 159-171.

Feldstein, M.S. (1974). 'Social Security, induced retirement, and aggregage capital accumulation,' Journal of Political Economy, volume 82, no. 5, pp. 905-926.

Feldstein, M.S. (1976). 'Social Security and saving; the extended life cycle theory,' American Economic Review Papers and Proceedings, volume 66, no. 2, pp. 77-86.

Feldstein, M.S. and Fane, G. (1973). 'Taxes, corporate dividend policy, and personal saving - British *postwar* experience,' Review of Economics and Statistics, volume 5, no. 4, pp. 399-411.

Ferber, R. (1973). 'Consumer economics - a survey,' Journal of Economic Literature, volume 11, no. 4, pp. 1303-1342.

Friedman, M. (1957). A theory of the consumption function, Princeton, Bureau of Economic Research.

Friedman, M. and Schwartz, A.J. (1963). A monetary history of the United States, Princeton, Princeton University Press.

Friend, I. and Kravis, I.B. (1957). *Consumption patterns and permanent income,' American Economic Review, volume 47, no. 2, pp. 536-655.

Friend, I. and Lieberman, C. (1975). 'Short-run asset effects on household saving and consumption - cross section evidence,' American Economic Review, volume 65, *no.* 4, pp. 624-633.

Friend, I. and Schor, S. (1959). 'Who saves?' Review of Economics and Statistics, 'volume 41, no. 2, 213-248.

Friend I. and Taubman, P. (19661. 'The aggregate propensity to save: some concepts and their application to international data,' Review of Economics and Statistics' volume 48, pp. 113-123.

Glick, P.C. (1947). 'The family cycle,' American Sociological Review, volume 12, pp. 104-174.

Goldfeld, S.M. (1973). 'The demand for money revisited.' Brookings Papers on Economic Activity, 1973, no. 3, pp. 577-638.

Griliches, 2. (1967). 'Distributed lags: a survey,' Econometrica; volume 35, pp. 16-49.

Haig, R.M. (1921). 'The concept of income,' in The federal income tax, (R.M. Haig, ed.), New York.

Heien, D.M. (1972). 'Demographic effects and multiperiod consumption function,' Journal of Political Economy, volume 80, no. 1, pp. 125-138.

Holmes, J.M. (1970). 'A direct test of Friedman's permanent income theory,' Journal of the American Statistical Association, volume 65, no. 3, pp. 1159-1162.

Houthakker, H. and Taylor, L.D. (1970). *Consumer* demand in the United States: analysis and projections, Cambridge, Mass., Harvard University Press.

Karni, E. (1973). 'Transactions demand for cash - incorporation of the value of time into the inventory approach,' Journal of Political Economy, volume 81, no. 5, pp. 1216-1225.

Keynes, J.M. (1936). The general theory of employment, interest, and money, New York, Harcourt, Brace and Johanovitch, 1965.

Kolm, S.-C. (1976). 'Public safety,' American Economic Review, volume 66, no. 3, pp. 382-387.

Kreinin, M.E. (1961). 'Windfall income and consumption - additional evidence,' American Economic Review, volume 51, no. 3, pp. 388-390.

Kuznets, S. (1946). National product since 1869, New York, National Bureau of Economic Research.

Laidler, D.E.W. (1969). The demand for money: theories and evidence, Scranton, Penn., International Textbook.

Lancaster, K. (1971). Consumer demand: a new approach, New York, Columbia University Press.

Lansing, J.B. and Kish. XC. (1957). 'Family life cycles as an independent variable,' American Sociological Review, volume 22, pp. X2-519.

Layard, P.R.G. (1974). 'The lifetime redistribution of income,' Paper presented at the International Economic Association Conference, 1974.

Lydall, H.F. (1955). 'The life cycle in income, saving and asset ownership,' Econometrica, volume 23, no. 2, pp. 313-150.

Mayer, T. (1972). Permanent income, wealth and consumption: a critique of the permanent income theory, the life-cycle hypothesis and related theories, Berkeley and Los Angeles, University of California Press.

Meltzer, A. (1963). 'The demand for money: the evidence from the time series,' Journal of Political Economy, volume 71, pp. 219-246.

Modigliani, F. and Brumberg, R. (1954). 'Utility analysis and the consumption function,' in Post-Keynesian economics, (Kurihara, K.K., ed.), New Brunswick, Rutgers University Press.

Modigliani, F. and Tarantelli, E. (1975). 'Consumption function in a developing economy,' American Economic Review, volume 65, no. 5, pp. 825-842.

Munnell, A.H. (1974). 'Impact of social security on personal saving,' National Tax Journal, volume 27, no. 4, pp. 553-567.

Munnell, A.H. (1976). 'Private pensions and saving: new evidence,' Journal of Political Economy, volume 84, *no.* 5, pp. 1013-1032.

Pollak, R.A. (1970). 'Habit persistance and dynamic demand functions,' Journal of Political Economy, volume 78, pp. 745-763.

Projector, D.S. (1968). Survey of changes in family finances, Washington, Federal Reserve Board.

Projector, D.S. and Weiss, G.S. (1966). Survey of financial characteristics of consumers, Federal Reserve Technical Paper, Washington, Board of Governors of the Federal Reserve System.

Rasche, R.H. (1972). 'Impact of the stock market on private demand,' American Economic Review Papers and Proceedings, volume 62, no. 2, pp. 220-233.

Simons, H.C. (1938). Personal income taxation, Chicago, University of Chicago Press.

Suits, B.B. (1964). 'The determinants of *consumer* expenditure: a review of present knowledge,' in Commission on Money and Credit, Impacts of monetary policy, Englewood Cliffs, New Jersey, Prentice-&11.

Taubman, P. (19651. 'Permanent end transitory income effects,' Review of Economics and Statistics, volume 47, no. 1, pp. 38-43.

Taylor, L.D. (1973). 'Saving of U.S. households: evidence from the quarterly Flow-of-Funds,' New York, National Bureau of Economic Research.

Tobin, J. **(1951).** 'Relative income, absolute income, **and saving,'** in Money, trade, and economic growth, essays in honor of **John Henry** 'Williams, New York, Macmillan.