

# The Networks of Consumption

While many of the most basic aspects of economic structure are in flux, human needs and desires provide a fixed point of reference. Whatever happens in the future, the output of the U.S. economy must ultimately be measured by the extent to which it allows Americans to achieve “amenity”: to be in good health, to have a varied and healthy diet, to be well clothed, to live in attractive housing, to receive a useful and interesting education, to expand options for personal communication, to travel, and to enjoy leisure time. Together with national defense and other functions necessarily provided by collective rather than individual purchasing, these amenities represent the real output of an economic system. The net productivity of the U.S. economy must be measured by the efficiency with which human time and talent are applied to their achievement.

The next two chapters define methods for measuring growth in amenity, and describe the “consumption recipes” used by Americans to achieve these amenities. These “consumption recipes” combine household purchases of goods and services, investment of unpaid time by household members, and public spending. The chapters provide a basis for describing possible changes in purchasing which, in turn, affect the structure of the producing sectors of U.S. economy, and ultimately the jobs that the economy creates.

It is not possible to develop a rigid definition of quality in any of the major classes of amenity. Concepts of quality are often readily understood—freedom of choice, good health, or happiness—but may be impossible to quantify. Some purchases are based on need, and some on choice. Some are spontaneous while others are induced by advertising. Many are shaped (or misshaped) by regulation, instinct, ignorance, or hasty decisions. Even if it were possible to develop a perfect way to measure amenity for an individual, it would be impossible to develop a perfect formula describing amenity for society as a whole.<sup>1</sup> Once incomes are adequate to provide for

<sup>1</sup>Kenneth Arrow argues that even if a function could be written to describe the way each individual would rank the value of different patterns of expenditure, it would be impossible to combine these functions to develop a method for ranking expenditure patterns for the group taken as a whole. K. Arrow, *Social Choice and Individual Values* (New Haven, CT. Yale University Press, 1963).

basic necessities, the extent to which spending buys satisfaction depends heavily on expectations. The quality of amenities available to a person considered wealthy at the turn of the century is below the expectations of even the poorest family today. On the other hand, the well-educated baby boom generation may have expectations that will be difficult for the economy to meet.<sup>2</sup>

The problem of defining and measuring amenity can, of course, be avoided if growth in national income can be used as a proxy for economic progress. Given this assumption, productivity can be measured by the efficiency with which labor and other inputs are converted into measurable quantities like CAT scanners, and not by the facility with which resources achieve longer lives or greater freedom in personal transport. Yet while such an approach solves many analytical problems, it is insufficient for the purposes of the analysis that follows for two critical reasons:

- Measures of amenity that are independent of spending levels are needed to consider public policy choices affecting the way consumers combine goods and services. There are obviously many cases where income measures of economic welfare are not adequate. Defects in public regulation or inappropriate public spending can be responsible for inefficiencies in the way consumers convert money to amenity. The quality of life in a community can decline while incomes increase if environmental quality deteriorates or social unrest undermines security. There may actually be a negative correlation between spending for health care and life expectancy, or between spending for burglar alarms and security. Policies designed to facilitate private choice can only be assessed given a clear understanding of the performance of networks that connect spending with amenity measured in human terms.

<sup>2</sup>A straightforward calculation shows that if the baby boom generation is to be paid as much as the previous generation on the basis of age and education, the U.S. gross national product (GNP) would need to grow at 2.5 percent per year. This rate of growth is needed if the baby boom generation is to fulfill its expectations for their investment in education. W.H. Esselman and O.S. Yu, “Economic Growth to Meet Income Expectations,” *Journal of Policy Analysis and Management*, vol. 2, No. 1, fall 1982, pp. 111-118.

- Analysis of trends in spending patterns may not provide a good basis for anticipating spending patterns over the next two decades. Technology can create: new products and services, radical declines in the prices of existing products, an increased ability to tailor products to individual needs, new sources of information about products, new retailing methods, changes in time available for making purchases, changed tastes, and new government regulations affecting both price and quality. There is no obvious way to estimate consumer response. It is also difficult to anticipate changes in public expenditures—nearly one-quarter of all personal and government spending combined. Defining the choices Americans have about the future is necessarily an inexact process. It is essential to begin with hypotheses about how public choices could affect the structure of future consumption recipes.

The next two chapters combine a formal analysis of trends in U.S. consumption over the last two decades with an assessment of choices about the direction of future spending, which is necessarily much less rigorous. While generalizations are difficult, the discussion traces a number of themes affecting the recipe for consumption. All stem from a growth of choice made possible by increased national income, new technologies (particularly those that improve communication and those that reduce the price difference between mass-produced items and items tailored to narrow markets), and an increase in international and domestic competition. The themes include:

- the growing complexity of consumption recipes and the increased demand for sophisticated consumer decisions;
- the fragmentation of some markets into a series of niches and the integration of others into undifferentiated commodities;
- advances in communication, marketing, and retailing technologies, which can improve the match between specialized products and specialized tastes;
- the growing desire for quality in both products and services;
- the rising importance of purchased services, partly associated with an increased interest in specialized products;
- a shift of activity formerly undertaken in the home to the marketplace, such as child care, coupled with substitution of household time for services formerly provided in the market, such as VCRs for movies and home health care for hospital care;
- the growing importance of time—as opposed to money—as a constraint on the achievement of amenity for many groups; and
- persistent signs that large groups of the population fall far below standard norms in a wide range of amenities, including health, housing, transportation, and even basic nutrition.

Chapter 2 begins by defining the eight categories of amenity that, taken together, constitute most of the output of the U.S. economy. It describes recent trends in private and public spending and personal time investments used to achieve each amenity, and the major forces behind these trends: income, income distribution, demographics, prices, new technologies, new patterns of regulation, and changes in taste. The chapter examines spending at the level of the economy as a whole, focusing on the major factors that influence consumer purchasing and applying standard methods to estimate how consumption may change. Among other things, it demonstrates how demand could change as a result of changed demographics, income and income distribution, and product prices, given consumer spending that follows trends established during the past two decades.

Chapter 3 leaves the comparatively safe world of macroeconomic statistics and plunges into the admittedly qualitative issues—whether amenities such as health care, housing, and recreation are improving for Americans, and whether they are likely to improve in the future. In each of the eight amenity categories, the discussion in chapter 3 proposes a way to measure change in the basic amenity (e.g., life expectancy, morbidity rates, and infant mortality in the case of health care), and then describes the way the quality of the amenity has changed for different groups during the past few decades. It pays special attention to groups most disadvantaged by the existing distribution of resources.

Finally, building on the base established in chapter 2, chapter 3 develops “Alternative” scenarios for each amenity. These alternatives are explicitly de-

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signed to improve the quality of the amenity deliv- ulation. It should be noted that the Alternative  
ered within fixed financial constraints. Economic fac-scenarios are speculative, and necessarily reflect  
tors are combined with factors that could not be some of the values of the people constructing them.  
predicted by extrapolation alone, such as shifts in Nonetheless, they may not be any less accurate than  
government policy and radically new technologies. an assumption that trends in consumer behavior can  
Significant improvements in amenity appear to be be confidently extrapolated to describe the structure  
possible in virtually every case, given the develop- of demand over the next two decades.  
ment of key technologies or changes in public reg-

**Chapter 2**

# **Defining the Consumption Recipe**

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# Defining the Consumption Recipe

Americans achieve amenity through the “consumption recipe”—combining household spending for goods and services, investments of time by household members (for which no compensation is received), and government spending.<sup>1</sup> These recipes

<sup>1</sup>In most cases, the “consumption recipes” considered here can be considered equivalent to the “utility functions” used in most analyses of demand. Moreover, a number of authors have shown how time can be included in the utility equation. See, for example, G.R. Ghez and G.S. Becker, “The Allocation of Time and Goods Over the Life Cycle,” working paper, National Bureau of Economic Research, New York, NY 1975.

are in constant flux, influenced by changes in household income, in the price of goods and services, and in demographics, as well as changes in technology that can result in new products, can affect the ways producers communicate with customers, and can even influence tastes and values. Changes in values are reflected directly through new patterns of consumer purchasing, and indirectly through new patterns of public spending and regulations designed to guide private spending. This chapter reviews how these forces have shaped and may continue to shape U.S. consumption recipes.

## DEFINING CATEGORIES OF AMENITY

For the purposes of the analysis that follows, all final household and government purchases are assigned to one of ten amenity categories (see box 2-A). The selection was necessarily somewhat arbitrary. Any classification scheme helps to illustrate some features of economic structure and obscure others. The categories were chosen because they cluster networks of spending where the underlying purpose is comparatively easy to describe. Chapter 3 will undertake the task of describing these purposes in ways that permit a working definition of progress in each of the first eight areas. The category of “recreation and leisure” proves to be the most difficult to define, since there is plainly an element of recreation involved with spending in all other categories. Is a walk in the park an investment in health or an investment in recreation? What about a car that is fun to drive, a home with a pleasant yard, a meal eaten in a good restaurant? The present study takes the restrictive definition of recreation used in the National Income and Product Accounts.\*

The spending shown in box 2-A includes only personal and government spending that goes directly for the purchase of amenity. The total does not include investment and savings. In 1985, consumption categories accounted for about 85 percent of the

U.S. gross national product (GNP). Most of the remainder represents investment.

The national statistical accounts, which serve as the base for most of the data in this study, have several peculiar features that are necessarily reflected in the analysis presented here.<sup>3</sup> One peculiarity is the distinction made between consumption and investment. In general, anything with value after a year is considered to be a form of savings and not consumption. As applied, however, this results in a situation where spending on a gold-tiled bathroom is considered to be an investment, while money spent on education is considered consumption. Similarly, all government spending is considered to be consumption. Government purchases of research and development, roads, dams, and education are not considered a form of national investment.

National accounts are also schizophrenic in the way they treat the nonwash economy. Nearly 8 percent of GNP reported by the U.S. Department of Commerce results from the “imputed” value of services that involve no real market transaction. This value includes the imputed income that homeowners receive by “renting” houses from themselves, in itself equal to nearly 6 percent of GNP; the imputed

\*U.S. Department of Commerce, Bureau of Economic Analysis, “National Income and Product Accounts,” *Survey of Current Business*, July 1987, table 2.4.

<sup>3</sup>A formal technique to remedy some of the problems described is proposed by Robert Eisner in “The Total Incomes System of Accounts,” *Survey of Current Business*, U.S. Department of Commerce, Bureau of Economic Analysis, January 1985, pp. 24-48.

Box 2-A.—The 10 Basic Amenity Groups  
(and as a percent of all personal and government spending on goods and services in 1985)<sup>1</sup>

<i>Definition</i>	<i>Percent of personal and government spending</i>
1. The <i>FOOD</i> category includes food and alcohol consumed in restaurants and purchased from stores. Government contributions include agricultural research and a variety of support programs for farmers.	15.1 %
2. The <i>HOUSING</i> category includes everything needed for the operation of a purchased or rented home, including rent and mortgage payments, and purchases of fuel, electricity, furniture, china, draperies, housecleaning, and other goods and services used to maintain a home. Government spending goes for both housing redevelopment programs and spending for infrastructure like water and sewer systems.	19.7% <sup>2</sup>
3. Personal spending for <i>TRANSPORTATION</i> includes all spending for mobility, including purchases of automobiles and other personal vehicles, vehicle maintenance, gasoline, and oil; and purchases of public transportation services (air, rail, bus, and taxi). Public spending includes highway construction attributable to personal travel, and maintenance and operation of air and rail facilities.	11.4%
4. Personal consumption in the <i>HEALTH</i> category includes purchases of drugs, physicians' fees, hospital costs (including payments made by Medicare and Medicaid), and spending for health insurance. Public spending includes hospital construction and operation, and community health services.	11.4%
5. Expenditures on <i>CLOTHING AND PERSONAL CARE</i> go for products and services ranging from apparel and footwear to toiletries and beauty salons. Clothing is by far the largest item in this category, accounting for more than 80 percent of the total. There are no direct government purchases of clothing and personal care as defined here.	6.7%
6. Personal <i>EDUCATION</i> spending includes payments to private schools and colleges. Government spending includes the operation of public school systems and libraries, subsidies for colleges, and worker training programs. <sup>3</sup>	7.2%
7. <i>PERSONAL BUSINESS AND COMMUNICATION</i> includes personal communication by telephone and writing, as well as personal financial, legal, and insurance activities.	6.4%
8. The category of <i>RECREATION AND LEISURE</i> is particularly difficult to define. It is clear that eating out, living in a comfortable home, and transportation are to some extent recreational activities. The more restrictive definition used here includes foreign travel, hotel accommodations, social and religious activities, and purchases of books, magazines, toys, home electronics, movies, and admissions. Government contributions include the operation of parks and recreation areas.	8.9%
9. The category <i>DEFENSE AND SPACE</i> includes only Federal Government purchases of goods and services for military and space.	7.7%
10. <i>GOVERNMENT NOT ELSEWHERE CLASSIFIED (NEC)</i> includes government purchases of goods and services other than defense. Activities include the operating costs of government not directly attributable to a specific amenity group (operation of the Congress and State legislatures); transportation spending not attributable to personal travel; the court system; police, fire, and correctional institutions; and the work of authors of this study.	5.6%

<sup>1</sup>In standard accounts, the "gross national product" is conventionally divided into the following components: Personal Consumption Expenditures, Government Purchases of Goods and Services, Net Exports, Gross Private Domestic Investment (consisting mostly of personal purchases of housing and business purchases of products with an expected life of more than 1 year), and an adjustment for changes in inventories. Government purchases of goods and services do not include transfer payments such as social security. Spending resulting from transfer payments is counted under Personal Consumption Expenditures. The spending shown in this table includes only personal consumption and government purchases. See the appendix for a detailed table showing how standard categories are mapped into the amenity categories shown here.

<sup>2</sup>The spending on housing shown here does not include any payments that result in an increase in the value of the U.S. housing stock from new construction or major renovation. Construction spending of this kind is considered "savings" and not consumption in conventional accounts. If purchases of new housing are included in the accounts, housing would be responsible for approximately 24 percent of the total.

<sup>3</sup>The accounts treat both private and public spending for education as consumption and not as a form of savings. Corporate training costs are not included.

**SOURCES:** Consumer purchases in these amenity categories are derived from the "Personal Consumption Expenditure" (PCE) categories used in the "National Income and Product Accounts" (NIPA), U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, July 1987, table 2.4. A precise map connecting these PCE categories to amenities is shown in the appendix. Categories of government purchases of goods and services are derived from tables 3.15 and 3.16 of the "National Income and Product Accounts." The map connecting spending categories in these tables with the amenity groups is also shown in the appendix.

rent paid by non-profit organizations that own their own buildings; the imputed value of liquidity in bank accounts and insurance funds; and the imputed value of food produced and eaten on farms.<sup>4</sup> The

<sup>4</sup>See U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," *Survey of Current Business*, July 1987, table 8,9.

national accounts do not, however, impute the value of housework, education provided at home, or time invested by standing in line at fast food restaurants.

## TRENDS IN THE CONSUMPTION RECIPE

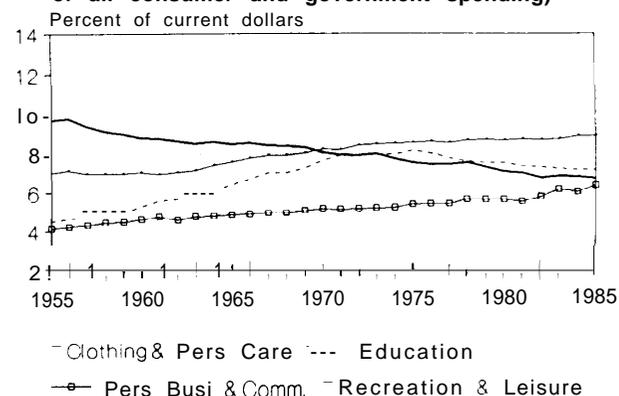
Before proceeding to examine the forces driving the change, it is worth taking a brief look at recent changes in the way Americans construct recipes to achieve amenity. These trends are described in three ways: by examining changes in overall patterns of spending for the amenities, by exploring trends in the way time was spent, and by reviewing qualitative features of spending patterns that are not adequately reflected in statistics on how Americans spend their time and money.

### Consumer and Government Spending

#### Share of Total Expenditures

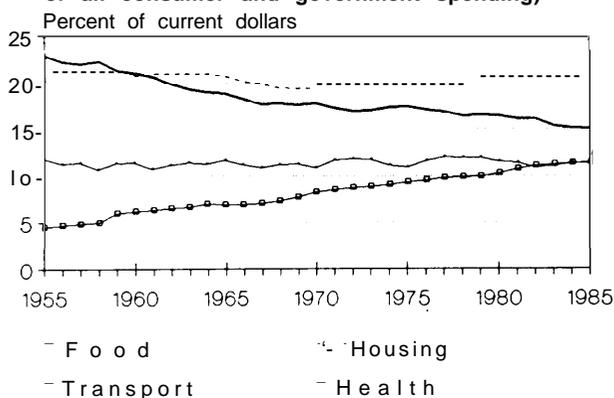
The history of household and government spending during the past three decades is traced in figures 2-la, 2-lb, and 2-lc. Looking at trends in expenditures on each of the different amenity groups, perhaps the most striking feature of the statistics is the

Figure 2-lb.-Spending by Amenity Type (percent of all consumer and government spending)



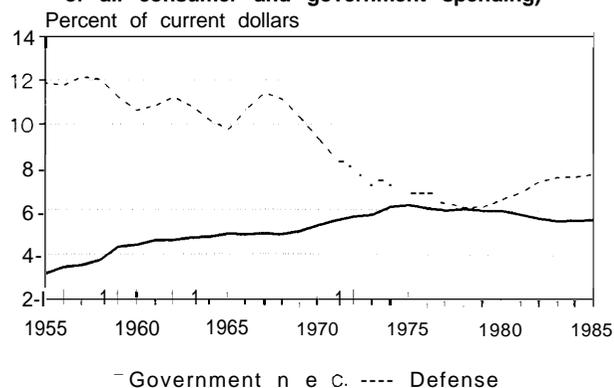
SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," historical diskettes, tables 2.4,3.15, 3.16.

Figure 2-la.-Spending by Amenity Type (percent of all consumer and government spending)



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," historical diskettes, tables 2.4,3.15, 3.16.

Figure 2-le.-Spending by Amenity Type (percent of all consumer and government spending)



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," historical diskettes, tables 2.4,3.15, 3.16.

continued high level of personal consumption expenditure (PCE) on the most basic of amenities. Housing, Transportation, Food, Health, and Clothing and Personal Care accounted for roughly two-thirds of U.S. consumer spending in 1985, changing little since 1950. The figures show:

- a rapid and consistent decline in the percent of income spent for Food, which has been almost precisely offset by a rapid and continuous growth of Health spending (Food lost and Health care gained about 8 percent of total spending between 1955 and 1985);
- a sharp rise of spending on education followed by declines after 1975 as the baby boom generation passed through the system;
- continuous growth of spending in Personal Business (primarily financial services) and Communication, which appears to have accelerated since 1981;
- a steady decrease in the share of spending going for Clothing and Personal Care; and
- a decline in Defense spending as a proportion of all spending, which reversed in 1979.

Spending for Housing and Transportation, two of the largest categories, has remained surprisingly constant since World War II—despite large changes in the prices of energy, automobiles, and housing; in the size and characteristics of households; and in real per capita spending, which has doubled in the last 40 years. Whenever Housing costs go above 21 percent of spending, or Transportation costs go above 12 percent, a subtle alarm seems to sound. This results from a combination of factors, including historically “fixed” formulas for the percentage of gross income that borrowers can expect for mortgage or car payments.

People have apparently used discretionary income to increase the quality and variety of purchases in amenity areas like Food (through more varied eating), Transportation (through higher quality cars and more cars per family), and Clothing and Personal Care, rather than spending new income on Recreation. As a fraction of all spending, Recreation and Leisure seems to have gone through a one-time jump between 1961 and 1972, with slow subsequent increases.

Dollars and Value.—The previous discussion showed how Americans spent their income in any

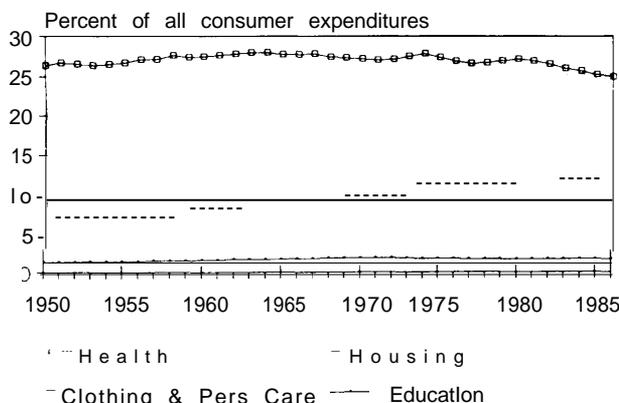
given year in “current dollars” —values measured in the currency of the year in which the data was collected. The statistics say little about either the quality or the quantity of the products and services purchased, since many relative prices changed rapidly during the period shown. Legal services that cost \$1,000 in 1955 might still be considered worth the price in 1987, but a computer equivalent to one that cost \$1,000 in 1955 would be worth very little in 1987. The effects of inflation can, in principle, be removed from product prices by converting spending to “constant dollars.” Converting current into constant dollars involves the vexing problem of developing a consistent set of prices for goods and services of constant quality. This process becomes more difficult during periods of rapid technological change. It can also become more difficult as a greater fraction of economic activity involves activities like legal services, where quality is inherently more difficult to measure (see discussion in ch. 5).

Most of the qualitative features of figures 2-1a to 2-1c remain when spending is converted into constant dollars (see figure 2-2), with one important exception: in constant dollars, spending on Clothing and Personal Care has risen sharply since the mid 1970s. Constant dollar spending by government for amenities cannot easily be estimated, since data is not collected on “constant quality” government services in much details

Another way to view the changes in average prices that have occurred during the past three decades, compared to changes in average incomes, is to see how long it has taken an average full-time worker in America to earn enough to buy items of comparable quality during the past few decades. In this respect, most manufactured goods have become a bargain while the real price of most services has changed little (see table 2-1). A television set that could be bought for 1 day’s work in 1972 needed over 4 days’ work in 1950 and only 4 hours’ work in 1986. Clothing, new cars, and communication services showed strong declines. On the other hand, most forms of medical services now require more work to purchase than was the case in 1950.

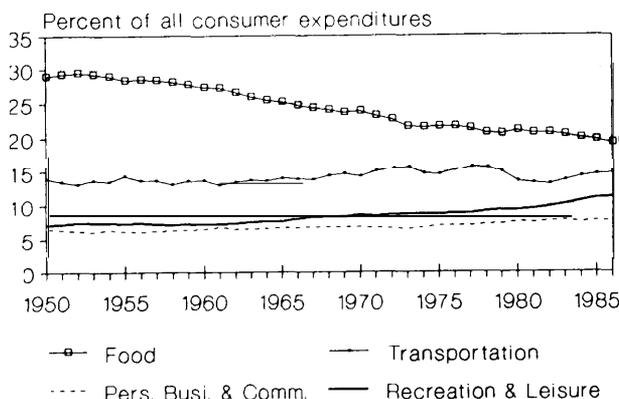
<sup>5</sup>For years in which data is available, constant dollar estimates of government spending can be computed by converting government spending in each category to spending in commodity categories for which output deflators are available. This could not be done for most of the period shown in figure 2-2.

**Figure 2-2a. -Constant Dollar Shares of Consumer Spending on Health, Housing, Clothing & Personal Care, and Education**



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," historical diskettes, table 2.5.

**Figure 2-2 b.-Constant Dollar Shares of Consumer Spending for Food, Personal & Business Communication, Transportation, and Recreation & Leisure**



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," historical diskettes, table 2.5.

Patterns of price reduction have also changed over time. Between 1950 and 1970, there was a significant decline in the amount of work needed by the average worker to make all purchases. Of the items listed in table 2-1, only mass transit required more labor to buy in 1970 than in 1950. Since 1970, however, many items require more work to purchase.

**Spending on Services.** -Attempts to separate "services" from "goods" have never been completely satisfactory. The category "services" combines housecleaning, brain surgery, banking, and car repair.

Most amenities are satisfied by a complex combination of purchased goods and services. Later chapters will show the extent to which even manufactured products embody non-manufacturing "service" activities. However defined, services represent an increasing fraction of consumer expenditures. The price of manufactured goods has declined much faster than that of services (table 2-1), while demand for services appears to have increased rapidly with rising incomes.

The curious pattern of decline and growth in demand for services between 1930 and 1986 is charted in figure 2-3. Rising from a low of less than one-third of all constant dollar spending at the end of World War II, services now command more than 40 percent—even given a comparatively narrow definition. Most recent growth in demand has not resulted from purchases of personal services like housekeeping, but rather from purchases of medical care, education, and professional services like banking, law, and insurance.

**Savings and Investment.**—In recent years, personal and government consumption has grown as net savings have declined. Figure 2-4 illustrates the decline in national savings rates during the past decade or so, measured as a percentage of GNP. A slight increase in rates of business savings, taken as retained earnings and in other ways, has been more than offset by a sharp decline in net government savings—the budget deficit—and by the drop in personal savings. Gross savings fell from over 18 percent of GNP in 1979 to about 13.5 percent in 1986. As will be outlined in chapter 8, this savings shortfall has been offset by large foreign investments in the United States.

### The Private/Public Mix

The mix of public and private spending used to purchase amenity differs greatly from one part of the economy to another (see table 2-2). Taken together, public spending categories together have held a surprisingly constant share of total spending for three decades. The combination of spending directly related to the first eight amenity groups, Defense, and Government spending not elsewhere classified has remained near 23 percent of all spending since 1955, with a brief excursion to 26 percent during the Vietnam War. Defense purchases fell steadily as a fraction of all current dollar spending toward the end

Table 2-1.—Change in Time Needed by the Average<sup>a</sup>American To Purchase Goods and Services  
(time worked to buy item in 1972=1.0)

Item purchased	1950	1960	1970	1980	1986
Radio and television receivers . . . . .	4.09	2.20	1.13	0.63	0.39
Women's and children's clothing . . . . .	2.02	1.36	1.07	0.71	0.55
Shoes. . . . .	1.47	1.24	1.07	0.85	0.68
Telephone and telegraph . . . . .	2.21	1.63	1.03	0.66	0.72
Durable goods (average) . . . . .	2.42	1.66	1.09	0.88	0.75
Recreation (BEA definition) . . . . .	1.37	1.21	1.06	0.86	0.80
New autos . . . . .	2.18	1.72	1.10	0.90	0.81
Admissions to spectator events . . . . .	1.19	0.99	1.05	0.87	0.87
Nondurable goods (average) . . . . .	1.80	1.34	1.06	1.04	0.90
Food (grocery) <sup>b</sup> . . . . .	1.80	1.35	1.06	1.06	0.94
Average personal consumption. . . . .	1.75	1.35	1.05	1.00	0.96
Transportation <sup>c</sup> . . . . .	1.39	1.20	0.99	1.02	0.99
Homeowning <sup>d</sup> . . . . .	1.72	1.40	1.05	0.94	1.01
Transit systems . . . . .	0.85	0.94	1.02	0.81	1.02
Home renting. . . . .	1.72	1.40	1.05	0.94	1.03
Drug preparations and sundries . . . . .	2.40	1.80	1.11	0.89	1.04
Food (restaurants) <sup>e</sup> . . . . .	1.25	1.02	1.01	1.01	1.07
Gasoline and oil. . . . .	1.98	1.54	1.11	1.89	1.08
Health insurance . . . . .	1.28	0.91	0.90	0.72	1.08
Airline . . . . .	1.82	1.34	1.03	1.23	1.17
Personal business <sup>f</sup> . . . . .	1.28	1.09	1.02	1.09	1.20
Medical care (all private) . . . . .	1.15	1.05	1.02	1.08	1.21
Privately controlled hospitals . . . . .	1.11	1.06	1.04	1.13	1.23
Household electricity . . . . .	2.22	1.53	1.02	1.19	1.25
Physicians . . . . .	1.13	1.05	1.03	1.12	1.28
Household gas. . . . .	1.73	1.46	1.01	1.66	1.82

How To Read This Table: The fraction of television and radio receivers that could have been purchased for 1 day of work in 1972 would have required 4.09 days of work to purchase in 1950 and 0.39 days of work to purchase in 1986.

NOTE: The categories are a representative sample and not a complete set. They are ranked by growth in the ratio between 1972 and 1988. For details, see table 2.4 of the National Income and Product Accounts.

<sup>a</sup>"Average" defined by average wage and salary earnings per full-time equivalent employee.

<sup>b</sup>Food purchased for off-premise consumption.

<sup>c</sup>Not including vehicle purchases.

<sup>d</sup>Mortgage payments less payment for equity.

<sup>e</sup>Food purchased for on-premise consumption.

<sup>f</sup>Bank service charges, insurance (non-health), brokers.

SOURCE: Based on U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," *Survey of Current Business*, historical diskettes, tables 6.8b and 7.10, July 1987.

of the Viet Nam War (figure 2-1c) while civilian spending increased. The trend was reversed in 1979 but Defense spending remains below the share it held during the 1955-68 period.

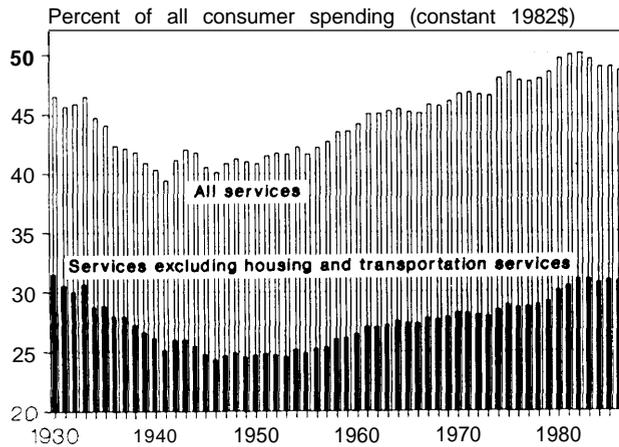
In most cases, patterns of purchasing have been comparatively stable. By long tradition, for example, government pays for roughly 85 percent of all Education; privately supported education has not made serious inroads. There have, however, been some changes in the mix of public and private spending. In Transportation, though most highways and some other transportation infrastructure are purchased publicly, many private developers have recently been required to build roads, sewers, parks, water supplies, sidewalks, and other infrastructure formerly provided at public expense. Table 2-2 in-

dicates a sharp decline in government spending on highway construction and other infrastructure. It also shows the effect of declines in support for Housing and parks (in the Recreation and Leisure category) that occurred in 1980.

## Time

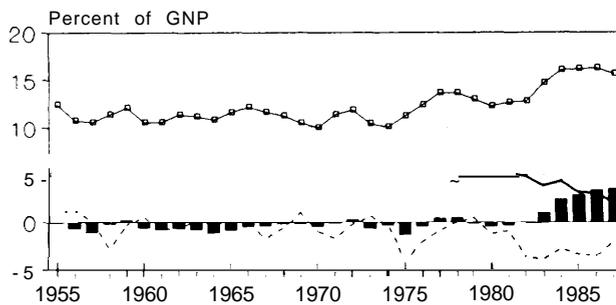
Incomes can increase due to productivity, but time available to spend that income remains fixed unless the economy moves to shorter work weeks and longer vacations. If anything, however, Americans are working harder and longer than they have in the recent past. Increased female participation in the work force has meant that many chores once purchased through unpaid "housewife" time (child care,

**Figure 2-3.-Share of Consumer Spending on Services**



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," historical diskettes, table 2.5,

**Figure 2-4.-Savings and Investment by Type**



— Personal Savings    - Business Savings  
 - - Government Savings    ■ Foreign Investment

**How To Read This Table:** In 1986, personal savings (investments in savings accounts, stocks, etc.) fell to 3% of GNP. The U.S. economy received more investment money from foreigners (nearly 4% of GNP in 1966). Because of the government deficit, government savings were a negative 3% of GNP. Net business savings (retained earnings, depreciation, etc.) rose to 16% of GNP.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts" historical diskettes, table 5.1,

care for the elderly, and even cooking) are now bought in the market.

Technology has made it possible to move many activities formerly available only through the marketplace into the home. The private automobile continues to replace purchased transit. The video cassette recorder and other home electronic equipment

are substituting for entertainment purchased away from home and seem to have had an impact on many of the social clubs and organizations that once occupied a significant amount of American time. Cost containment in health care, combined with the emergence of elaborate home care equipment, has forced many kinds of health delivery out of the hospital and into the home. Interest in self-administered health promotion, such as diet and exercise programs, has grown. Direct marketing—using 800-numbers, credit cards, home shopping networks, and the United Parcel Service—has risen dramatically. In effect, technology has "capitalized" household time to make it more productive. But while this has increased the productivity and decreased the burden of housework in principle, real savings are difficult to find.

Personal investment in self-training appears to have increased as well, in areas related to both employment and recreation. Home information is one of the most curious examples. In the past, information acquired from radio and television broadcasting was purchased primarily through unpaid investment of a consumer's time—waiting through commercials. The consumer bought only the receiver. Purchases of information in the form of cable television and video cassettes (including rentals), however, are beginning to approach the total value of equipment sales.

### Trading Time and Money

A number of attempts have been made to understand how individuals trade personal time against time spent in the marketplace.<sup>7</sup> Will an individual choose to work fewer hours and enjoy more leisure as a result of higher wages, and is it institutionally possible to do so? Alternatively, will a person with a higher income feel that the effective cost of leisure time is also high and prefer to work longer? The choice requires an understanding of the way individuals substitute leisure time for goods, but theory does not pretend to predict an answer and available

<sup>6</sup>J. Vanek, "Time Spent in Housework," *Scientific American*, vol. 231, 1974, pp. 116-120.

<sup>7</sup>See J.D. Owen, *Working Lives* (Lexington, MA: Lexington Books, 1979); G.R. Ghez and G.S. Becker, op. cit., footnote 1. Early work on trade-offs between leisure time and work time can be found in Lionel Robbins, "On the Elasticity of Income in Terms of Effort," *Economica*, No. 10, pp. 123-29, 1930. Also see discussion in ch.11 tying income to the desire for more or less work.

**Table 2-2.—Government Spending as a Percent of Final Consumption in Each Amenity Group  
(current dollars, in percent)**

Amenity	1955	1965	1975	1985
Food . . . . .	2.6%	0.7%	1.4%	3.8%
Housing . . . . .	1.5	2.5	2.9	2.0
Transportation . . . . .	11.3	13.1	11.8	9.1
Health . . . . .	6.0	19.7	22.1	17.5
Clothing and Personal Care . . . . .	0.0		0.0	0.0
Education . . . . .	82.5	84.0	85.2	82.7
Personal Business and Communication . . . . .	0.0	0.0	0.0	0.0
Recreation and Leisure . . . . .	2.2	2.9	4.2	3.3
Defense . . . . .	100.0	100.0	100.0	100.0
Government n.e.c. . . . .	100.0	100.0	100.0	100.0
<b>Total (GNP). . . . .</b>	<b>21.4</b>	<b>23.7</b>	<b>24.6</b>	<b>23.5</b>

**How To Read This Table:** In 1955, 2.6 percent of aff final consumption of Food resulted from Federal, State, or local government purchases of goods and services related to this amenity.

NOTE: The large increase in government spending for the Health amenity between 1955 and 1965 resulted from a redefinition of this category between 1958 and 1959.

SOURCE: Based on U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," *Survey of Current Business*, tables 2.4, 3.15, and 3.16, July 1987.

behavioral evidence is ambiguous. An obvious shortcoming of conventional approaches to the issue is that they assume workers do not derive any satisfaction from their jobs<sup>8</sup> (see ch. 11 for a discussion of these issues).

#### Trends in Time Use

There have been many changes in how time is divided between work, including housework, and leisure. Comparisons between time use surveys conducted in the 1930s and the 1960s, for example, show considerable increases in work time and decreases in free time. One of the major areas of growth in work time was housework, in particular the time spent shopping and traveling on household errands. It appears that the impact of the deluge of time- and labor-saving home appliances during this period was to lengthen rather than shorten the amount of time spent on housework.<sup>9</sup>

Between 1965 and 1975, however, Americans experienced considerable gains in free time and declines in the amount of time spent both working for pay and working in the home. More women were

working for pay, but on average they were working considerably fewer hours than before.<sup>10</sup> Time spent on housework also declined considerably, by 20 percent overall. The combined decline in labor market time of about 40 minutes per day and in housework of about 14 minutes per day resulted in a 10-percent increase in leisure time.

What were Americans doing with their increased free time during this period? Primarily, they were watching television. On average, TV viewing time in 1975 totaled about 14.7 hours per week, the equivalent of all time spent on housework and 1.5 times as much as time spent eating. TV viewing constituted 50 percent of all leisure, and more than 60 percent of all time spent on "passive leisure."

More recent time use data, collected in 1985, suggest that over the past decade the use of time has changed once again (see table 2-3).<sup>11</sup> A sharp increase in work time, largely the result of women working longer hours, is mirrored by a decline in free time.<sup>12</sup>

<sup>8</sup>Tibor Scitovsky, *The Joyless Economy* (Oxford: Oxford University Press, 1976).

<sup>9</sup>The impact of new home technologies on time use is complicated. C.L. Long, *Labor Force Under Changing Income and Employment* (Princeton, NJ: Princeton University Press, 1958), argued that improved household technologies made women more productive in the home and increased female leisure, thereby freeing them for more market work. However J. Vanek, in "Time Spent in Housework," op. cit., footnote 6, refuted the notion of increased household productivity.

<sup>10</sup>John P. Robinson, "Changes in Americans' Use of Time: 1965-1975: A Progress Report," Communications Research Center, Cleveland State University, August 1977.

<sup>11</sup>John P. Robinson, "Trends in Americans' Use of Time: Some Preliminary 1975-85 Comparisons," Survey Research Center, University of Maryland, December 1986.

<sup>12</sup>Data provided by the U.S. Bureau of Labor Statistics indicate that the number of hours worked per adult grew at a slower rate than that captured in the survey discussed here, due largely to earlier retirement among older men, which has tended to offset the entry of women into the U.S. work force (see discussion in ch. 11). This time use survey however, does not capture the offsetting effects of earlier retirement, primarily because the number of men surveyed who were over age 55 did not constitute a statistically significant sample.

Table 2-3.—Weekly Time Budgets: Men and Women, 1975 and 1985 (in hours)

	1975			1985			Change in hours 1975 v. 1985		
	Men	Women	Average	Men	Women	Average	Men	Women	Average
Contracted time .....	32.9	14.5	23.7	33.2	21.3	27.3	0.3	6.8	3.5
work .....	30.0	13.4	21.7	29.6	19.3	24.5	-0.4	5.9	2.7
travel to work .....	2.9	1.1	2.0	3.6	2.0	2.8	0.7	0.9	0.8
Committed time .....	15.6	33.1	24.3	16.6	28.6	22.6	1.0	-4.5	-1.7
housework .....	8.1	21.6	14.8	9.4	17.7	13.5	1.3	-3.9	-1.3
child care .....	1.0	3.6	2.3	0.8	3.0	1.9	-0.2	-0.6	-0.4
shopping .....	2.7	4.1	3.4	2.8	4.1	3.5	0.1	0.0	0.1
family travel .....	3.8	3.8	3.8	3.6	3.8	3.7	-0.2	0.0	-0.1
Personal time .....	75.3	78.6	76.9	75.9	79.6	77.7		1.0	0.8
eat at home .....	6.6	6.6	6.6	6.3	5.8	6.1	-0.3	-0.8	-0.5
eat out .....	3.0	1.9	2.4		2.0		-0.7	0.1	-0.3
personal care .....	65.7	70.1	67.9	67.3	71.8	69.5	1.6	1.7	1.6
Free time .....	44.2	41.6	42.9	42.1	38.3	40.2	-2.1	-3.3	-2.7
education .....	3.0	1.8	2.4	2.6	1.7	2.1	-0.4	-0.1	-0.3
organization .....	1.4	2.4	1.9	1.4	1.7	1.5	0.0	-0.7	-0.4
social .....	6.9	7.0	6.9	5.5	4.7	5.1	-1.4	-2.3	-1.8
recreation .....	4.7	4.5	4.6	5.0	4.1	4.5	0.3	-0.4	-0.1
electronic med .....	18.4	15.9	17.1	17.2	15.6	16.4	-1.2	-0.3	-0.7
other media .....	6.6	7.5	7.1	6.6	7.8	7.2	0.0	0.3	0.1
leisure travel .....	3.2	2.5	2.9	3.8	2.7	3.3	0.6	0.2	0.4

SOURCE: John P. Robinson, "Trends in Americans' Use of Time: Some Preliminary 1975-85 Comparisons," Survey Research Center, University of Maryland, December 1986, p. 34.

All age groups of women have increased their hours of paid work by about 6 hours a week, while there has been relatively little change in the numbers of hours of paid work for men. The increase among women was offset to some extent by a decline in hours of housework, but there was also an average loss of more than 3 hours per week in women's leisure time. In fact, women in most age groups have 5 to 6 hours less leisure time per week than men. The exception is the 35 to 54 age group, where men and women appear to have the same amount of leisure time. Ten years ago, women had more leisure time than men in this age group.

There have also been changes in how leisure time is used. The two largest uses of leisure time are social activities and electronic media. Time spent in social activities declined by 26 percent between 1975 and 1985. Television viewing, expressed in the table as part of "electronic media," also declined by varying amounts among the different age groups. At the same time, a sharp increase in time spent in telephone conversations was recorded. For example, time spent on the telephone doubled for men aged 25 to 44, and increased by 10 percent for men over 65. Although there has traditionally been a gender gap in the use of the telephone, by 1981 this difference disappeared in the youngest age cohort.

Allowing for statistical vagaries, Americans seem to spend more days and more hours on the job per

day than is the norm for industrialized nations. Between 1953 and 1983, average weekly hours worked by U.S. production workers remained virtually constant, moving from 40.7 to 40.1 with only minor fluctuations. During the same period, however, hours in other industrial countries decreased, often markedly. Canadian workers averaged 40.1 hours in the mid 1950s against 37.1 in 1982, during which time the Italians declined from 44.7 to 37.7 hours and Belgian averages fell from 41.6 to 31.7. Between 1965 and 1983, the French average declined from 45.8 to 39.3. The West Germans, Dutch, and British workers now work more hours than their U.S. counterparts (40.3 to 40.6 hours in 1983). The Japanese worked 41.1 hours.<sup>13</sup>

Long commutes also constrict American leisure. The United States shares with Australia the second lowest percentage of people commuting to work 15 minutes or less (36 percent), exceeding only the Netherlands (21 percent).<sup>14</sup>

Vacation time and paid leave offer other indications of the character of Americans as workers. The United States has, with the enactment of Martin Luther King Day, nine national holidays, with addi-

<sup>13</sup>U.S. Department of Labor, Bureau of Labor Statistics, *Handbook of Labor Statistics*, Bulletin 2217, Washington, DC, June 1985.

<sup>14</sup>Organization for Economic Cooperation and Development, "Living Conditions in OECD Countries: A Compendium of Social Indicators," OECD Social Studies No. 5, Paris, 1986, p. 85.

tional holidays particular to some States such as Patriots' Day in New England. This is lower than all but 2 of 14 OECD (Organization for Economic Cooperation and Development) nations surveyed.<sup>15</sup> Unlike most of OECD, the United States does not impose a legal minimum of compensated leave.

### Time and Consumer Decisions

The amount of free time available also affects the quality of purchasing decisions made by Americans.<sup>16</sup> Conflicting forces are again at work. On the one hand, future consumers are likely to be better educated than those of earlier generations, and will have a wide range of new technologies available for gaining access to information. On the other hand, consumers are likely to have less time to analyze information and make major decisions. Increased incomes, dual earner households, and the growing complexity of choice resulting from diversified product offerings means that decisions are becoming more frequent and more difficult while less time is available to make them.<sup>17</sup> In fact, many retailers find that major purchasing decisions are being made by teenagers whose parents may have little time to shop.<sup>18</sup>

While imperfect consumer decisions that result from minimizing the time spent collecting and analyzing information may be a rational response by individuals, society as a whole may pay a much greater price.<sup>19</sup> This raises a number of real challenges for those wishing to forecast the future of consumer spending,

### Qualitative Factors

The data just cited provide a crude guide to changes in the ways Americans spend their income

<sup>15</sup>*Ibid.*, p. 89.

<sup>16</sup>One of the central assumptions in much economic analysis is that consumers are perfectly informed and rational in the way they make decisions, that this information is free, and that any defects in decisionmaking will continue into the future. There is now a considerable literature discussing defects in this assumption. The defects are not particularly important if the degree or the significance of misinformation do not change significantly over time. The discussion in ch. 3, however, shows many places where significant changes may occur in the way consumers obtain and use information.

<sup>17</sup>S. B. Linder, *The Harried Leisure Class* (New York, NY: Columbia University Press, 1970).

<sup>18</sup>C. Russell, "The New Homemakers," *American Demographics*, October 1985, p. 23.

<sup>19</sup>Tibor Scitovsky, *op. cit.*, footnote 8.

and time—changes whose influence on the structure of the economy as a whole will be illustrated in later chapters. As spending has moved further from needs and necessities to decisions reflecting a range of tastes and choice, it has generally been distributed in familiar ways. Americans spent about one dollar in five on Housing in 1950 and the same fraction in 1986, in spite of the fact that real per capita income more than doubled during the period.

Many factors in the structure of household and government demand that affect the quality of amenity achieved, as well as the structure of producing enterprises, are not well reflected in these statistics. They include such things as changes in the *quality* of the houses purchased, the type of food Americans eat, and the kinds of cars they drive. These issues are discussed at much greater length in chapter 3. One general observation, however, deserves attention. Many markets formerly dominated by a comparatively small number of relatively homogeneous products are becoming "boutique" markets, combining a wide range of specialties. There are, of course, markets for low-priced commodities—but the "low cost, vanilla-flavored product" is now itself a kind of niche.

Chapter 3 will demonstrate that specialization is replacing commodity-like products in a remarkable variety of markets—and will suggest a number of areas where specialization is likely to grow rapidly. Financial packages in areas such as insurance and investment can be designed and analyzed rapidly by trained people working with a computer terminal. The mass media are becoming differentiated, as specialized magazines replace such publications as the *Saturday Evening Post*. An industry directory indicates that there were 11,000 periodical titles in 1986, an increase of 60 percent from 1985.<sup>20</sup> Broadcast television has had its market fragmented by cable TV and video cassette recorders. Eating habits have diversified, as both restaurants and larger groceries cater to a wider variety of tastes.

This product differentiation is driven by a variety of factors, including the growing diversity of Amer-

<sup>20</sup>The directory includes titles like: *Walking, Running, Wildfowl Carving, Gambling Times, Vegetarian Times, North Texas Golfer, Croquet Today*, and *The Quarterly Magazine of The Rocky Mountain Elk Foundation*. See S. Fatsis, "A New Leaf: Magazine Industry Flourishing," *Associated Press*, Oct. 11, 1987.

ican households, the movement of comparatively well-educated baby boomers into their peak earning years, and technology that allows both production of specialized products without an enormous price premium and highly targeted advertising.<sup>21</sup> However, it proves difficult to disentangle cause and effect. It is likely, for example, that the demand for tailored products was always latent but difficult to express because of the large cost premiums involved. Changes in taste also play a role, but are far harder to document.

It does little good to produce for a specialized market if it is impossible to market the product within that niche. New technology, however, has also changed the way that producers can reach specialized markets. Printing and mailing catalogs to spe-

<sup>21</sup>See also Aimee L. Stern, "The Baby Boomers Are Richer and Older," *Business Month*, October 1987, pp. 24-28.

cialty lists has become an enormously sophisticated enterprise. The Montgomery Ward catalog has given way to a plethora of specialized pamphlets. Active consumer participation in the design of products, including information products, is another likely development. Homes can be designed, with the assistance of a skilled salesman, on a computer in showrooms. Even clothing may soon be tailored at an affordable price using robotic sewing equipment. As later chapters will show, the shift to specialized goods and services is having a profound impact on the structure of the business networks that produce amenities. In particular, technologies that appear to have economies of scale in a situation where demand is predictable may perform poorly in a rapidly changing market. A flexible production system may use equipment with comparatively inexpensive "set-up" times and small truck deliveries instead of bulk freight, even though these systems appear to be less productive than those they replace.

## FORCES AFFECTING THE CONSUMPTION RECIPE

The changes in spending patterns just described have been driven by a variety of forces that will continue to play a powerful role in shaping future recipes of consumption. Demographic factors, such as changes in the number and type of American households, the aging of the baby boom generation, and the growing number of elderly people, will affect spending patterns, as will changes in household income, income distribution, and prices.

The following discussion examines these forces in some detail, in order to develop a portrait of how Americans may spend their money in the future—assuming that such an estimate can be derived from data on demographics, income, and prices. This allows for the creation of "Trend" scenarios, using standard extrapolative techniques to project spending patterns. These Trend cases will also serve as the basis for the "Alternative" scenarios, which will be described at some length in chapter 3. The Alternatives make assumptions about the role of new products, new regulations, new values, and other factors that may not be captured in standard statistical series—however clever the extrapolation technique.

### **Households**

National averages can provide a grossly misleading view of national living standards. Every American household has its own needs and resources, and its own recipe for happiness. Depending on its nature, economic growth can benefit some groups but not others. One way of looking below the veil imposed by averages is to examine spending patterns by household type and household income.<sup>22</sup> Household analysis is also needed to understand how well the economy is meeting the needs of a diverse population, and how it is serving those most likely to be disadvantaged.

#### Trends in the Formation of Households

Characteristics of households have changed rapidly over the past two decades, following changes

<sup>22</sup>See, for example, Roberta Barnes and Robert Gillingham, "Demographic Effects in Demand Analysis: Estimation of the Quadratic Expenditure System Using **Microdata**," *The Review of Economics and Statistics*, No. 591, 1984; and Robert Gillingham, "Measuring the Cost of Shelter for Homeowners: Theoretical and Empirical Considerations," *Review of Economics and Statistics*, vol. **LXV**, No. 2, 1983.

in both the age structure and lifestyle of the population. The average American household shrank from 3.33 people in 1960 to 2.65 in 1983 and has continued to decline, largely as a result of the striking increase in the number of people living alone. The number of all single households has nearly doubled since 1960 and amounted to nearly one-quarter of all such American households in 1983; the share of young singles grew over 60 percent between 1972 and 1983 (see table 2-4). One in every eleven Americans now lives alone. Since the average size of a household is shrinking, the total number of households has grown more rapidly than the U.S. population in recent decades.

At the same time, significant changes in lifestyle have taken place. The post-war era has seen more women join the work force, incomes rise, a growth in divorce rates, and an increase in the number of young Americans who have decided to live away from home. These factors are giving a new look to the American household. Only about one-fifth of American households now include a working father,

a housewife, and children,<sup>23</sup> down from nearly one-third in 1972. As table 2-4 indicates, all categories of married couples under age 65 have declined in share since 1972—when the oldest members of the baby boom were 26, an age after which the traditional expectation would be an *increase* in the share of married couples.

Indeed, the baby boom generation, born just after World War II, has played a major role in reshaping American demographics, and its weight will continue to be felt as its ranks pass through different age cohorts. In 1960, 41 percent of the population was under the age of 21. By 1982, this figure had fallen to 34 percent. Other age groups have become more populous as the median age of the population has risen.

The demographic model used for this analysis<sup>24</sup> indicates that during the next 20 years the number of U.S. “consumer households”<sup>25</sup> will increase by

**Table 2-4.—The Composition of Consumer Households: 1972, 1983, and Estimates for 2005 (In percent)**

Household (HH) type	Percent of total		
	1972 <sup>a</sup>	1983	2005
<b>Singles</b> . . . . .	<b>11.5%</b>	<b>15.2%</b>	<b>14.7%</b>
Age 15-34 . . . . .	4.2	6.9	4.9
Age 35-64 . . . . .	7.4	8.3	9.8
<b>Elderly (65+)</b> . . . . .	<b>19.2</b>	<b>20.3</b>	<b>20.7</b>
Single . . . . .	8.3	8.9	9.1
Couples . . . . .	10.9	11.4	11.6
<b>Couples</b> . . . . .	<b>58.0</b>	<b>47.4</b>	<b>48.4</b>
No children . . . . .	16.9	14.0	14.5
Child <6 years old . . . . .	9.2	7.4	5.8
Child 6-17 years old . . . . .	20.8	16.0	16.3
Child >17 years old . . . . .	11.1	10.0	11.8
<b>Single parent</b> . . . . .	<b>5.1</b>	<b>6.6</b>	<b>5.9</b>
<b>Other</b> . . . . .	<b>6.2</b>	<b>10.5</b>	<b>10.3</b>
Unrelated adults . . . . .	1.5	4.0	3.3
Other . . . . .	4.7	6.5	7.0
<b>Total (percent)</b> . . . . .	<b>100.0</b>	100.0	<b>100.0</b>
<b>Total (millions of HH)</b> . . . . .	<b>69.3</b>	88.8	<b>118.6</b>

<sup>a</sup>1972 shares correspond to “families,” as defined by the U.S. Bureau of the Census’ “Consumer Population Survey.” For the 11 household types, the differences in 1983 share between “families” and “consumer households” were all less than 1 percent.

NOTE: Totals may not equal 100 due to rounding.

SOURCES: 1972 figures taken from U.S. Bureau of the Census, “Consumer Population Survey;” 1983 and 2005 figures taken from “Household Formation Program,” working paper prepared for the Office of Technology Assessment, Washington, DC, May 1986.

W. Russell, op. cit., footnote 18.

<sup>24</sup>“Household Formation Program,” working paper prepared for the Office of Technology Assessment, Washington, DC, May 1986. See box 2-B and the appendix for more detail. For other projections of household composition, see U.S. Bureau of the Census, Current Population Reports, Series **P-25, No. 986, “Projections in the Number of Households and Families: 1986-2000”** (Washington, DC: U.S. Government Printing Office, 1986); John R. Pitkin and George S. Masnik, “Households and Housing Composition in the United States, 1985 to 2000: Projections by a Cohort Method,” Joint Center for Housing Studies of MIT and Harvard University, Research Report **RJ86-1**, Cambridge, MA, 1986; and Patricia H. Hendershott, “Household Formation and Home Ownership: The Impact of Demographics and Taxes,” National Bureau of Economic Research, Working Paper No. 2375, Cambridge, MA, September 1987.

<sup>25</sup>The term “consumer household” in this analysis is used in place of the term “consumer unit” used by the U.S. Bureau of Labor Statistics. A “consumer household” is “a single person or group of persons in a sample household related by blood, marriage, or adoption or other legal arrangement, or who share responsibility for at least two out of three major types of expenses—food, housing, and other expenses.” Consumer households are divided into 11 “household types,” for which trends and scenarios on composition and spending are developed. See “Household Formation Program,” working paper prepared for the Office of Technology Assessment, Washington, DC, May 1986. The term “consumer household” is used in this discussion to differentiate it from the generic term “household,” used in other parts of ch. 2.

Consumer households (or consuming units) should not be confused with other precise definitions of “households” or “families.” As defined by the U.S. Bureau of the Census, “Current Population Survey” (CPS), Technical Documentation, March 1984, a “household” is as follows: “A household consists of all the persons who occupy a house, an apartment, or other group of rooms, or a room, which constitutes a housing unit. A group of rooms or a single room is regarded as a housing unit when it is occupied as separate living quarters; that is, when the occupants do not live and eat with any other person in the structure, and when there is direct access from the outside or through a common hall” (this does not include “group quarters” like rooming houses, military barracks, or institutions).

about one-third—an average annual increase of 1.3 percent (again see table 2-4). This is a higher rate of increase than that of total population because of an expected continuing decline in household size. The distribution of major consumer household categories should remain fairly stable, with the largest change on the order of 1 percent (married couples under age 65). The distribution of types within categories, however, will shift somewhat, due to the aging of the baby boomers. Single consumer households age 35 to 64 and married couples with children over 17—the two groups in which baby boomers will be counted most frequently in 2005—will increase more than any other type; at the same time, young singles and couples with children under 6 will lose share.<sup>26</sup>

### Spending by Type of Consumer Household

Data describing expenditure by type of consumer household are sparse. The primary source is the U.S. Bureau of Labor Statistics' "Consumer Expenditure Survey" (CES), which uses only a small sample and suffers from a number of other drawbacks—there was no survey taken between 1972/73 and 1982/83. If the CES data are used in an aggregated form, however, they give reasonable results, and the 1982/83 survey is used as the basic household database in this study.<sup>27</sup>

Table 2-5 shows how different consumer households spent their money in 1972/73 and 1982/83. Housing costs represent a significant fraction of the spending of couples with young children, singles, and single parents; housing captured the highest fraction of spending among single elderly households. Not surprisingly, smaller households spend more per capita on housing than their larger counterparts. The share of spending devoted to housing has increased

The consumer household is also distinct from the CPS "family," which is defined as "a group of two persons or more (one of whom is the house holder) residing together and related by birth, marriage, or adoption."

There may be several families in a single household.

<sup>26</sup>It should be noted that the number of elderly households will begin to increase rapidly after 2011, 6 years beyond the scope of the scenarios used in this analysis.

<sup>27</sup>Expenditure categories for consumer households are taken from the "Consumer Expenditure Survey," and are not an exact match with the amenity categories outlined earlier in this chapter. See "Consumer Expenditure Demand Projection Program," working paper prepared for the Office of Technology Assessment, April 1986. For more detail, see the appendix.

since the 1972/73 CES survey for all but two consumer household types.

Per-person expenditures on food are high in single consumer households, which do not benefit from economies of scale in food preparation. Within the food category, young singles and childless couples both spend far more on food away from home than their larger and/or older counterparts, although all households spend a smaller fraction of their incomes eating out than cooking at home. Still, in households headed by someone 34 years of age or less, almost half of all expenditures on food are away from home, compared with 27 percent in the over 65 group. Similarly, per capita spending for away-from-home entertainment is higher for younger singles and childless couples than for the elderly. On the other hand, spending on air fares, hotels and motels, home electronic and other devices, and alcohol increased for every household type.

Out-of-pocket medical expenses increased sharply for the elderly during the 1970s and early 1980s, and remain much higher than for other cohorts; health care also became a greater burden for single parents. Out-of-pocket spending for education increased for most consumer household types; the increases were particularly dramatic for young singles and single parents, while parents with children of college age continued to spend more on education than any other group. All household types increased the percentage of spending on personal business and communication, while the converse was true for spending for clothing and personal care.

The proportionately greater spending that the single elderly devote to housing and medical care reduces the money they can spend elsewhere. Not surprisingly, the single elderly, a group with comparatively little mobility, devote fewer resources to transportation and recreation and leisure than other groups, while the share going to personal business—largely time spent on the telephone—is greater than that of any other.

### **Income**

Household income affects not only the level but also the type of expenditures made by Americans. As incomes increase, families typically spend a smaller proportion of their income on food—though

Table 2-5.—Spending by Consumer Household Type, 1972-73 and 1982-83 (current dollars, in percent)

Household type	Food	Housing	Transportation	Health	Wearing and Personal Care	Education	Personal Business and Communication	Recreation and Leisure	Total
<b>1972-73:</b>									
<b>Singles:</b>									
Age 15-34 .....	18.0	33.3	25.6	2.4	9.4	0.7	3.2	7.3	100.0
Age 35-64 .....	24.6	33.2	17.7	4.9	9.8	0.2	3.6	6.0	100.0
<b>Elderly:</b>									
Single .....	25.2	39.6	10.6	9.1	7.6	0.1	3.4	4.3	100.0
Couples .....	27.8	27.5	18.6	9.6	8.0	0.6	2.7	5.3	100.0
<b>Couples:</b>									
No children .....	22.0	28.0	24.7	5.2	9.7	0.6	2.6	7.2	100.0
Child <6 .....	19.5	35.2	22.2	5.3	8.7	0.6	2.6	5.9	100.0
Child 6-17 .....	26.9	27.9	20.8	4.9	9.8	0.9	2.1	6.6	100.0
Child >17 .....	25.9	22.0	25.7	4.8	9.9	3.5	2.0	6.1	100.0
Single parent .....	26.3	35.6	15.1	3.3	10.8	1.2	3.1	4.6	100.0
<b>Other:</b>									
Unrelated adults .....	24.6	27.6	22.8	5.5	9.6	2.2	2.8	4.9	100.0
Other .....	27.6	26.3	21.9	5.2	10.0	1.0	2.5	5.6	100.0
<b>1982-83:</b>									
<b>Singles:</b>									
Age 15-34 .....	21.1	32.7	22.3	2.8	7.3	2.9	3.7	7.3	100.0
Age 35-64 .....	21.7	36.9	20.5	4.0	6.7	0.3	4.2	5.7	100.0
<b>Elderly:</b>									
Single .....	21.6	40.1	11.0	12.7	5.9	0.2	5.1	3.4	100.0
Couples .....	24.2	28.9	20.4	10.8	6.4	0.5	3.3	5.5	100.0
<b>Couples:</b>									
No children .....	20.7	30.7	25.4	4.6	7.3	1.2	3.2	6.9	100.0
Child <6 .....	19.5	36.9	22.5	3.8	6.7	1.8	2.7	6.1	100.0
Child 6-17 .....	22.8	30.2	22.8	3.8	7.6	2.1	2.6	8.0	100.0
Child >17 .....	23.9	24.6	26.5	4.4	8.2	3.4	2.9	6.2	100.0
Single parent .....	24.1	32.9	18.4	4.1	8.5	2.3	4.3	5.4	100.0
<b>Other:</b>									
Unrelated adults .....	21.9	29.0	27.4	4.2	6.8	0.9	4.4	5.4	100.0
Other .....	25.2	30.8	20.9	3.8	8.3	1.5	4.0	5.5	100.0

SOURCES: For household types, see "Household Formation Program," working paper prepared for the Office of Technology Assessment, Washington, DC, May 1986; for expenditure categories, see U.S. Bureau of Labor Statistics' "Consumer Expenditure Survey," 1972/73 and 1982/83.

in absolute terms, the highest income group spends twice as much per family member for groceries as the lowest, and eight times more for meals at restaurants.<sup>28</sup> Wealthier families also devote more of their resources to clothing, education, and recreation, while lower income groups spend comparatively more on health care. Such differences reflect the fact that as incomes fall, basic expenditures must be maintained while such “luxuries” as new clothes and recreation are cut back.

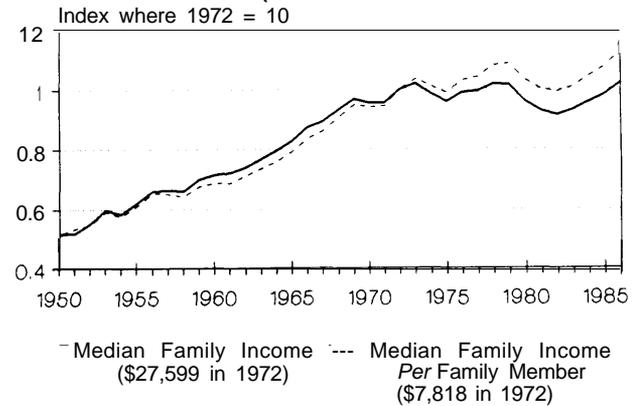
Tracing spending patterns by income and income cohort is needed to understand how changes in national income may affect spending, and also to understand the fate of low income families who may be hurt by changes in income distribution. It is difficult, however, to disentangle the effects of social class and fashion on spending from the effects of income. Given the lack of data, a snapshot of spending in one year (cross-sectional data) must often be used to anticipate future changes over time—an admittedly perilous assumption for extrapolation. It is not obvious, for example, that if future economic growth gave middle class families purchasing power equivalent to that of wealthy households today, they would spend the income in the same way as today’s rich.

### Trends in Income and Income Distribution

The long upward trend in median family income per family member stopped in the late 1960s (see figure 2-5). While the income available for spending has remained roughly constant, there has been a striking change in the distribution of income among families since the mid 1970s. The average incomes of all but the wealthiest families fell between 1977 and 1984, while those of families in the very highest income groups increased sharply (see table 2-6). Indeed, only the wealthiest 10 percent of American families enjoyed any growth in average income between 1977 and 1984. In effect, the wealthiest 10

<sup>28</sup>This study divides the 11 consumer household types introduced in the previous discussion into 7 income cohorts. The cohorts are selected by first ranking all consumer households by “income per consumer household member” (e.g., a family of four with a household income of \$20,000 would have an “income per consumer household member” of \$5,000); this ranked set is then divided into 7 groups consisting of equal numbers of consumer households. Expenditure categories are taken from the “Consumer Expenditure Survey,” developed by the Bureau of Labor Statistics at the U.S. Department of Labor. See “Consumer Expenditure Demand Projection Program,” *ibid.*

Figure 2-5.-Changes in Family Income  
(in 1984\$)



**How To Read This Table:** Median family income (half of all families earn more and half earn less than the “median” income) and median family income per family member (median income divided by the number of people in each family) both approximately doubled between 1950 to 1972, when growth stopped abruptly. In spite of growth in the 1960s, median income returned to 1972 levels only in 1986.

SOURCE: U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 150, *Money Income of Households, Families, and Persons in the United States: 1985* (Washington, DC: U.S. Government Printing Office, 1986).

percent of U.S. families enjoyed all of the increase in economic output of this period. The U.S. Congressional Budget Office (CBO) forecast shown in table 2-6 anticipates real income growth for nearly all family groups between 1984 and 1988, though the rate of growth will be greatest within the wealthiest decile.<sup>29</sup>

The sharp differences in rates of income growth mean that the wealthiest families are capturing a growing share of all income available for personal spending. The wealthiest 20 percent of all families now command 50 percent of U.S. after-tax family income. Assuming that this trend continues, half the work of anticipating how Americans will spend their money during the next few decades involves anticipating the spending habits of this wealthiest quintile. The share of all national income earned by the wealthiest 1 percent of all households increased 4 percentage points between 1977 and 1984 (see figure 2-6); the share of the wealthiest groups is expected to increase through 1988, even after accounting for the effects of 1986 tax reform.<sup>30</sup>

<sup>29</sup>U.S. Congressional Budget Office, *The Changing Distribution Of Federal Taxes: 1975-1990* (Washington, DC: U.S. Government Printing Office, October 1987).

<sup>30</sup>U.S. Congressional Budget Office, *ibid.*, p. 70.

**Table 2-6.—Average Family Incomes Before and After Taxes<sup>a</sup> (000s of 1987 dollars)**

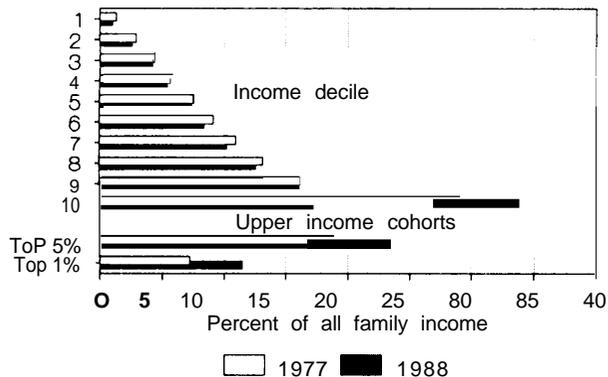
Income cohort <sup>b</sup> (deciles)	Before taxes			After taxes		
	1977	1984	1988	1977	1984	1988
1 .....	\$ 4.1	\$ 3.4	\$ 3.5	\$ 3.8	\$ 3.0	\$ 3.2
2 .....	8.3	7.4	7.6	7.6	6.8	7.0
3 .....	13	12	12	11	10	11
4 .....	18	16	17	15	14	14
5 .....	24	21	22	19	18	18
6 .....	29	27	28	24	22	22
7 .....	36	33	34	28	26	27
8 .....	43	42	43	34	32	33
9 .....	54	54	55	42	41	42
10 .....	107	115	122	75	87	90
Top 5% .....	144	160	172	97	120	125
Top 1% .....	307	387	430	187	283	304
All families .....	\$ 34	\$ 33	\$ 34	\$ 26	\$ 26	\$ 26

**How To Read This Table:** In 1977, the before-tax income of the 10% of all families with the lowest family income was \$4,100 (1987 dollars), which fell to \$3,400 (1987 dollars) in 1984. During the same period, the after-tax family income of the wealthiest 1% of all families increased from \$187,000 to \$283,000 (1987 dollars).

<sup>a</sup>The "before-tax income" includes the taxes paid by corporations. These taxes are assigned to households in proportion to their income from capital. This income is, of course, collected from companies, and never reaches the households to which it is allocated.

<sup>b</sup>The income cohorts are constructed by ranking all families in order of their total income (including the corporate tax "income" described in the previous note). The first decile is the 10 percent of families with the lowest incomes, etc.

SOURCE: Based on U.S. Congressional Budget Office, *The Changing Distribution of Federal Taxes: 1975-1990* (Washington, DC: U.S. Government Printing Office, October 1987).

**Figure 2-6.—Distribution of Family Income After Taxes**

**How To Read This Table:** In 1977, the average family in the 1% of families with the highest incomes received about 7% of all family income, while in 1988 these families are expected to receive 11% of all family income. On the other hand, there was no significant change in the share of income received by the families in the eighth income decile, which remained close to 10% of all family income. Families are placed in "deciles" as follows: all families are ranked by their total income; the bottom 10% are in the first decile, the next 10% are in the second decile, etc. (the incomes reported assume that corporate taxes are allocated to capital and not labor income).

SOURCE: U.S. Congress, Congressional Budget Office, "The Changing Distribution of Federal Taxes: 1975-1990," Washington, DC, October 1987.

Diverging paths of income growth represents a reversal of an earlier trend. Between 1950 and 1967, for example, the wealthiest 20 percent of American families actually lost their share of total U.S. personal income, dropping from 42.7 to 40.4 percent, while the shares of all other income groups—particularly those of the lowest 40 percent—increased. Since that time, the trend has been toward increased share among the upper income groups and a decline elsewhere; the pace of this movement doubled during the 1979-84 period.<sup>31</sup>

Changes in the distribution of family incomes depend on changes in several different areas (discussed below):<sup>32</sup>

- the distribution of individual wage and salary earnings,

<sup>31</sup>Richard s. Belous, Linda H. LeGrande, and Brian W. Cashell, "Middle Class Erosion and Growing Income Inequality: Fact or Fiction?" U.S. Congressional Research Service, Library of Congress Report No. 85-203 E, Nov. 28, 1985. Trends in income distribution between 1979 and 1984 must be treated with caution since they represent different points in the business cycle. See also the discussion on page 376.

<sup>32</sup>All of these factors are discussed at greater length in ch. 11.

- the number of wage earners in each family (a family may have a high income by combining a number of low wages),
- the distribution of capital earnings, and
- the distribution of transfer payments and other earnings.

While a considerable amount of work has been and is being done to disentangle these factors, much remains unknown.<sup>33</sup> Given available data, it appears that growing inequality of family incomes is driven primarily by shifting demographics and inequality in capital income, rather than by inequality in wage and salary earnings of workers (see figure 2-7).<sup>34</sup> The “Gini” coefficient that measures wage inequality indicates little change since 1967, while inequality in

<sup>33</sup>Numerous studies argue that the distribution of American income is becoming less equal, propelled by the arguments made in Barry Bluestone and Bennett Harrison, *The Deindustrialization of America* (New York, NY: Basic Books, 1982). Recent discussions include, among others, Lester C. Thurow, “A Surge in Inequality,” *Scientific American*, vol. 256, No. 5, May 1987, pp. 30-37; Gary Burtless, “Inequality in America: Where Do We Stand?” *The Brookings Review*, summer 1987, pp. 9-16; Kathryn L. Bradbury, “The Shrinking Middle Class,” *New England Economic Review*, Federal Reserve Bank of Boston, September/October 1986; and J. Rose, *The American Profile Paster* (New York, NY: Pantheon Books, 1986).

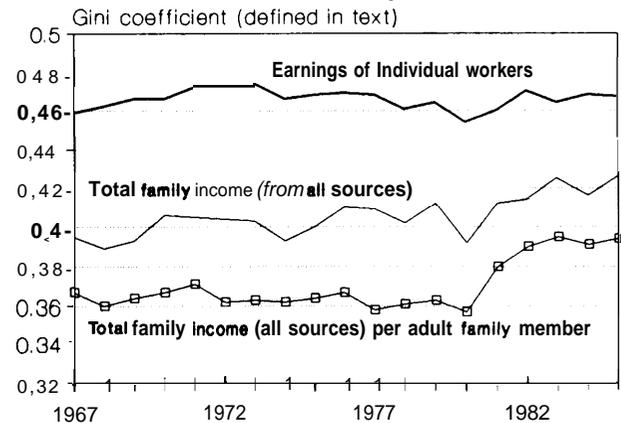
Others argue that such conclusions should not be drawn so quickly. Neal H. Rosenthal, in “The Shrinking Middle Class: Myth or Reality?” *Monthly Labor Review*, March 1985, pp. 3-10, indicated that trends in weekly wage and earnings (as distinct from income) measured by occupation point to movement away from both lower and middle wage groups and into the upper third. Other studies finding that income distribution is not growing less equal include Marvin H. Koster and Murray Ross, “Deficits, Taxes, and Economic Adjustments,” in American Enterprise Institute, *Contemporary Economic Problems*, Philip Cagan (ed.), Washington, DC, 1987; Sar. A. Levitan and Peter E. Carlson, “Middle Class Shrinkage?” *Across the Board*, October 1984, pp. 55-59; and Robert J. Samuelson, “Middle-Class Media Myth,” *National Journal*, Dec. 31, 1983, pp. 2673-2678.

Attempts have been made to reconcile these conflicting views. Robert Z. Lawrence, in “Sectoral Shifts and the Size of the Middle Class,” *The Brookings Review*, fall 1984, pp. 3-11, argued that growing unequal distribution of income between 1969 and 1983 was real, but was due to the demographic effects of young baby boomers entering the work force and not to the wage effects of an employment shift to lower paying industries. Patrick J. McMahon and John H. Tschetter, in “The Declining Middle Class: A Further Analysis,” *Monthly Labor Review*, September 1986, pp. 22-27, found that while the proportion of all jobs in high-wage occupations (again, as distinct from income) increased during the 1973-82 period, the earnings distribution within those occupations grew somewhat poorer.

For more on this subject, see U.S. Congressional Research Service, “Middle Class Decline? Bibliography-in-Brief, 1983-1986,” No. 87-68 L, Washington, DC, January 1987.

<sup>34</sup>McKinley L. Blackburn and David E. Bloom, “The Effects of Technological Change on Earnings and Income Inequality in the United States,” National Bureau of Economic Research, working paper No. 2337, Cambridge, MA, August 1987.

Figure 2-7.-income Distribution from Three Different Perspectives



**How To Read This Table:** Inequality in yearly wage and salary earnings of individual workers remained roughly unchanged between 1967 and 1985, while total family income (from wages and all other sources) per adult became less equal starting in the late 1970s. In this figure children are counted as a fraction of an “adult equivalent” in computing per adult income. The measure of inequality used is the “gini coefficient” in which 1 indicates extreme inequality and 0 exact equality. See Blackburn and Bloom for definitions.

SOURCE: McKinley L. Blackburn and David E. Bloom, “The Effects of Technological Change on Earnings and Income Inequality in the United States,” National Bureau of Economic Research, working paper No. 2337, Cambridge, MA, August 1987.

family income (which includes capital income) has increased sharply since 1980.<sup>35</sup>

These findings are based on data from the U.S. Bureau of the Census that brings with it a limitation in analysis of income distribution: the actual income of the wealthiest families is not reported. Wealthy families report only that their incomes are above some threshold level, or “top code”—a level that has increased at irregular intervals over the last decade. Since much income growth has occurred in the wealthiest families, it is obvious that the Census data introduces some distortion.

Using data which avoids the “threshold” difficulty, the CBO analysis discussed above suggests that between 1977 and 1984, the Gini coefficients for after-tax income increased from 0.42 to 0.47; before taxes, the coefficients were 0.45 in 1977 and 0.48 in 1984.<sup>36</sup>

<sup>35</sup>The Gini coefficient measures inequality. A coefficient of 0 means perfect equality, a coefficient of 1 would mean that all earnings or income is received by one family.

<sup>36</sup>U.S. Congressional Budget Office, *op. cit.*, footnote 29. The pre-tax Gini coefficients assume that corporate income taxes allocated to capital earnings.

The inclusion of the income of wealthier families leads to a coefficient considerably higher than those shown in figure 2-7,

**Wage and Salary Earnings of Individuals.**—Technical change, shifts in industry structure, changing trade patterns, changing management strategies, an increase in part-time work, and a variety of other factors all play a role in determining individual wage and salary earnings; the issue is examined more thoroughly in chapter 11. In brief, there appears to be no net change in the earnings of individuals (see the top line in figure 2-7). This results in part because the convergence of male and female wages has removed a major source of inequality.<sup>37</sup>

The CBO data, which include the distribution of wages and salaries among high-income groups, indicates that high-income families are increasing their total share of all wage income as well as their share of total income. The wealthiest 10 percent of families increased their share of all labor income from 29 percent in 1977 to 32 percent in 1984.<sup>38</sup> Unfortunately, it is impossible to use the data to separate differences in labor earnings per family from differences in earnings by each family member.

**Family Composition.**—Changes in the composition of families have had a major effect on the distribution of family income. Families with only one earner, particularly those headed by women with children, have significantly lower incomes than those with multiple earners.<sup>39</sup> This alone contributes to family income inequality. Indeed, the shrinking size of households has produced a decline in the number of earners per household in recent years. The average household had 1.16 earners in 1979, but only 0.94 earners in 1984.<sup>40</sup> Inequality is further increased by a strong correlation between the wages earned by individuals in the same family. A man earning the minimum wage is most likely to be married to a person earning the minimum wage, while virtually no men earning more than \$75,000 in 1984 were married to working women making less than \$10,000 a year.<sup>41</sup>

<sup>37</sup>M. Blackburn and D. Bloom, op. cit., footnote 34.

<sup>38</sup>U.S. Congressional Budget Office, op. cit., footnote 29, p. 65.

<sup>39</sup>H. Hayghe, "Two-Income Families," *American Demographics*, September 1981, pp. 35-37.

<sup>40</sup>U.S. Department of Commerce, Bureau of the Census, "Current Population Survey," various years.

<sup>41</sup>Lester C. Thurow, "The New American Family," *Technology Review*, August/September 1987, p. 27.

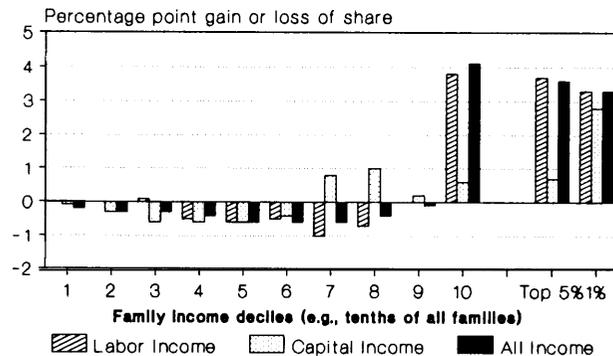
Taken together, demographic factors had the effect of increasing inequality in family income since 1980, even while there was no greater inequality in the earnings of individuals (the middle line in figure 2-7). When family income is expressed as income per family member, inequality has grown even more rapidly (the bottom line in figure 2-7).

**Capital Income.**—Income from capital sources is distributed much less equally than income from labor. Not only is capital (or "unearned") income becoming a larger share of all family income, but the way this income is allocated among families is becoming less equal (see figure 2-8). In 1984, the wealthiest 10 percent of all families had 63 percent of all income from capital, and the wealthiest 1 percent of families had 37 percent.<sup>42</sup> Similarly, ranked by net worth, the bottom 26 percent of American households owned only 10 percent of total net worth in 1984, while the top 12 percent of households owned 38 percent of total net worth.<sup>43</sup>

<sup>42</sup>U.S. Congressional Budget Office, op. cit., footnote 29.

<sup>43</sup>U.S. Department of Commerce, Bureau of the Census, "Household Wealth and Asset Ownership: 1984," *Current Population Reports*, Household Economic Studies, series P-70, No. 7.

**Figure 2-8.—Change in the Share of Family Income: 1977 to 1988 (change in percentage share of all personal income)**



**How To Read This Table:** The share of all income earned by families in the 10th income decile increased over 4 percentage points between 1977 and 1988. The share of families in the 6th income decile fell by about 1/2 of a percentage point. The incomes reported assume that corporate taxes are allocated to capital and not labor income.

SOURCE: U.S. Congress, Congressional Budget Office, "The Changing Distribution of Federal Taxes: 1975-1990," Washington, DC, October 1987.

## The Influence of Income Distribution on National Spending

The impact that changing income distribution could have on expenditures is shown in table 2-7. Two alternatives are explored: one, called the “middle” case, in which it is assumed that in 2005 all consumer households are in the middle income cohort; and another, the “extremes” case, in which consumer households are divided equally between the two highest and two lowest income cohorts, with none in the middle.<sup>44</sup>

<sup>44</sup>Of the 7 income cohorts introduced earlier in this chapter, selected by ranking all consumer households by “income per consumer household member” and dividing the ranked set into 7 heptiles consisting of equal numbers of consumer households, the fourth heptile is the “middle.” Expenditure categories are taken from the “Consumer Expenditure Survey,” developed by the Bureau of Labor Statistics at the U.S. Department of Labor. See “Consumer Expenditure Demand Projection Program,” op. cit., footnote 27.

The results suggest that if equality in income distribution is increased, more would be spent on food, housing (mostly home maintenance), transportation (mostly auto-related), and recreation (goods). Less would be spent on clothing and personal care (with the exception of non-apparel services like health clubs and beauty parlors) and personal business (other than phone use). Of the amenities listed here, only spending on personal business would change significantly.

If there were less equality—the extreme case—proportionally more would be spent on clothing and personal care and recreation (mostly services), and less on transportation (especially new cars, though air fares would also grow). There would be little difference among the other amenity categories, though increased spending on household maintenance services and appliances would be offset by

**Table 2.7.—The Potential Impact of Changing Income Distribution on Personal Consumer Expenditures in the Year 2005 (assuming 3 percent annual economic growth, no change indexed to 100.0)**

Amenity or item purchased	Change in spending on selected amenities or items		Amenity or item purchased	Change in spending on selected amenities or items	
	Middle <sup>b</sup>	Extremes <sup>c</sup>		Middle <sup>b</sup>	Extremes <sup>c</sup>
Food . . . . .	104.0	98.7	Clothing and Personal Care . . . .	94.2	106.9
Food and beverages at home.	105.4	98.7	Personal care commodities . . .	92.9	109.8
Food and beverages away			Personal care services . . . . .	113.5	107.2
from home . . . . .	102.3	98.6	Men's and boys' clothing . . . .	86.8	105.8
Tobacco . . . . .	98.5	99.1	Women's and girls'		
Housing . . . . .	101.9	100.9	clothing . . . . .	98.4	105.1
Owner occupied . . . . .	104.2	93.2	Other (including jewelry). . . .	82.9	106.1
Renters. . . . .	87.3	106.3	Footwear . . . . .	94.2	114.1
Maintenance services . . . . .	112.7	154.8	Apparel services. . . . .	93.7	108.9
Maintenance commodities . . .	111.8	86.6	Personal Business and		
Tenants' insurance. . . . .	105.0	99.8	Communication . . . . .	83.8	100.4
House furnishings . . . . .	107.9	98.4	Telephone . . . . .	103.7	100.3
House appliances. . . . .	97.0	132.8	Personal business . . . . .	77.5	100.4
Water and sewer . . . . .	101.3	112.6	Recreation and Leisure . . . . .	104.0	103.2
Transportation. . . . .	104.1	90.0	Entertainment services . . . . .	91.9	120.3
New vehicles. . . . .	103.8	73.8	Entertainment		
Used vehicles . . . . .	113.1	90.7	commodities . . . . .	117.3	88.9
Vehicle maintenance . . . . .	110.6		TV and sound . . . . .	110.7	105.1
Other private transportation . .	113.0	89.3	Lodging . . . . .	98.0	96.6
Air fare . . . . .	91.3	108.5			
Other public transportation . .	84.7	95.8			

**How To Read This Table:** Assuming 3 percent annual economic growth through 2005, in an economy where all households earned an income in the “middle” cohort (#4 of 7, where 7 cohort ranges are divided into equal numbers of households), the spending index for food would be 104.0—in other words, Americans would purchase 4 percent more food than would be the case with no change in income distribution. If all households were divided between the two lowest and two highest cohorts (“extremes”), the spending index on food would be 98.7, or 1.3 percent less than the “no change” scenario.

<sup>a</sup>The totals for PCE on amenity groups include certain items which have not been listed separately because the 2005 scenarios assume that expenditures on them would remain constant even with changing income distribution. See the appendix for details.

<sup>b</sup>Assumes all households in the middle income cohort (#4 of 7).

<sup>c</sup>Assumes households evenly distributed between two low and two high income cohorts (#1,2,6,7, of 7).

SOURCE: U.S. Congress, Office of Technology Assessment, “Consumer Expenditure Demand Projection Program,” April 1966, based on data provided by the U.S. Department of Labor, Bureau of Labor Statistics; the U.S. Department of Commerce, Bureau of Census and of Economic Analysis; and the U.S. Department of Health and Human Services, Social Security Administration.

declines in maintenance commodities and new homes.

Comparing the middle case with the extremes, an economy consisting entirely of middle income consumer households would spend more on home purchasing, food (particularly food at restaurants), vehicles, and entertainment commodities. Households would also enjoy more of their entertainment at home.

### Prices

The response of consumers to changes in price has received considerable theoretical attention, but applications of the theory are often frustrated by the scarcity of data. Complex interactive relationships (cross elasticities) make the problem difficult—consumption of beef may decline even when beef prices remain constant if chicken prices fall. Looking to the future, price effects pose an even greater dilemma, due to both the great difficulty of forecasting relative prices and the need to consider such issues as: will spending for travel decline if the price of communications falls?

In practical terms, these issues can only be handled by examining particular amenity networks in detail—a task undertaken in chapter 3. For present purposes, however, it is useful to have a feeling for the influence that a continuation of recent price trends might have on spending patterns. A complete set of recent price elasticities, constructed in a way that accounts for demographic effects, provides the basis of this analysis (again see the appendix).<sup>45</sup>

<sup>45</sup>p. Devine, "Forecasting Personal Consumption Expenditures From Cross-Section and Time-Series Data," Ph.D. Dissertation, University of Maryland, 1983.

### **Demographics, Income, and Price: The Combined Effect**

The possible effects of changes in household structure, income, and prices on household expenditure are shown in table 2-8. The table shows relative changes, not absolute ones. Overall, Americans would spend more on two-thirds of the items identified.

The figures assume annual 3 percent growth in GNP over the next 20 years, and that future household spending patterns can be estimated from current ones. Because incomes would increase rapidly in a high-growth economy, most of the changes presented in the table are caused by income effects rather than demographic ones (changes in population and household structure). If economic growth were slower, demographic effects would become more important.

The biggest change in share of spending comes in the food amenity, which loses 5.26 percentage points as a share of national spending. Most of this results from declines in grocery eating; eating out holds a virtually constant share. Under the assumptions of these calculations, spending on recreation would capture a growing fraction of all consumer spending because of both price and income effects.

Changes in household types would result in some increase in housing expenditures, but the overall effect would be more than compensated for by changes in income. Income increases would also lead to sharp growth in demand for restaurant eating, air travel, clothing, personal business, and entertainment services, while Americans would spend proportionally less on apartment rentals, smoking, and time spent on the telephone.

## ALTERNATIVES FOR THE FUTURE

### **Constructing Scenarios**

The remainder of this chapter describes alternative hypotheses about the ways consumers might spend their money (and instruct their governments to spend money in their name) in 2005. One such hypothesis is that things will continue much as they are now, and that the statistics already compiled on

households, income, and prices can simply be extrapolated into the future—the "Trend" scenarios (see the appendix). Under these assumptions, spending for 2005 can account for an aging population by assuming that the aging baby boomers in a given income class will spend money in the same way as similar groups spend money today. There is, however, a qualification: the older baby boomers will

**Table 2-8.-The Effects of Demographic Change, Income Growth, and Price Change on U.S. Personal Consumption in 2005 (changes in percent of all spending)**

Amenity or item purchased	Percent change from 1983 due to various factors				
	All	Demographic	Income	Price	Interactive
<b>Food</b> .....	-5.26	0.07	-3.37	-1.87	-0.10
Food and beverages at home .....	-4.41	0.04	-4.05	-0.45	0.06
Food and beverages away from home .....	-0.15	0.03	1.31	-1.30	-0.19
Tobacco .....	-0.70	0.00	-0.63	-0.11	0.04
<b>Housing</b> .....	-0.48	0.40	-1.91	1.72	0.11
Owner occupied .....	0.28	0.19	0.00	0.47	0.00
Renters .....	-1.91	0.32	-1.81	0.19	0.03
Maintenance services .....	0.01	0.01	0.10	-0.07	-0.01
Maintenance commodities .....	-0.49	0.02	-0.30	-0.24	0.03
Tenants insurance .....	-0.02	0.04	0.02	-0.09	0.01
House furnishings .....	0.95	0.03	0.06	0.84	0.02
House appliances .....	0.71	0.01	0.17	0.47	0.06
Water and sewer .....	-0.01	0.01	-0.15	0.16	-0.03
<b>Transportation</b> .....	-0.51	0.06	0.38	-0.96	0.02
New vehicles .....	-0.33	0.03	-0.00	-0.33	-0.02
Used vehicles .....	-0.24	0.01	0.05	-0.29	0.01
Vehicle maintenance .....	-0.13	0.04	-0.06	-0.14	0.04
Other private transportation .....	-0.02	0.00	-0.01	-0.01	0.00
Airfare .....	0.37	0.00	0.37	-0.01	-0.00
Other public transportation .....	-0.17	0.00	0.02	-0.18	-0.00
<b>Clothing and Personal Care</b> .....	1.84	0.10	1.63	0.01	0.10
Personal care commodities .....	0.06	0.00	0.06	-0.00	0.00
Personal care services .....	0.11	0.01	-0.02	0.11	0.01
Men's and boys' clothing .....	0.39	0.02	0.38	-0.02	0.01
Women's and girls' clothing .....	0.94	0.06	0.87	-0.05	0.05
Other (including jewelry) .....	0.24	0.01	0.25	-0.01	0.01
Footwear .....	0.03	0.01	0.02	-0.01	0.01
Apparel services .....	0.06	0.00	0.06	-0.00	0.00
<b>Personal Business and Communication</b> .....	0.95	0.07	1.26	-0.16	-0.23
Telephone .....	0.17	0.02	-0.35	0.61	-0.08
Personal business .....	0.78	0.09	1.61	-0.77	-0.15
<b>Recreation and Leisure</b> .....	3.47	0.10	2.02	1.26	0.09
Entertainment services .....	1.26	0.06	1.43	-0.21	-0.02
Entertainment commodities .....	0.89	0.02	0.20	0.64	0.03
TV and sound .....	0.83	0.00	0.11	0.68	0.03
Lodging .....	0.49	0.02	0.28	0.14	0.06

**How To Read This Table:** Assuming 3 percent annual economic growth through 2005, 2005 household distribution, and prices and incomes adjusted to this growth, the percentage of American spending on food eaten at home (as a share of the items listed here—roughly three-quarters of all personal spending) would decline by 4.41 percentage points. Changing incomes would account for a drop of 4.05 points and changing prices would account for a 0.45 point drop, while demographic changes would exert a slight positive trend of 0.04 percentage points; the effect of interaction between these factors would be a rise of 0.06.

**NOTES** This table estimates how U.S. consumer spending on selected items and amenities could change, and attempts to isolate what factors may contribute to that change. The "All" column assumes 3% annual economic growth through 2005, 2005 household structure as developed earlier in this chapter, and a set of possible price changes for these items in 2005 as outlined in the appendix. Incomes are then raised by 35.5%, the level at which Americans will have enough purchasing power to satisfy the estimate of personal spending in 2005 (also developed in the appendix).

For individual components of change:

- For demographic changes in 2005: see table 2-4; price and income held at 1983 levels.
- For income changes in 2005: incomes raised by 35.5 percent; demographics and prices held at 1983 levels.
- For price changes in 2005: see the appendix; demographics and income held at 1983 levels.

The effects of these three components that cannot be traced individually but are rather the result of a combination of factors are captured in the "Interactive" column

**SOURCE** U S Congress, Office of Technology Assessment, "Consumer Expenditure Demand Projection Program," April 1986, based on data provided by the U.S. Department of Labor, Bureau of Labor Statistics; the U.S. Department of Commerce, Bureau of Census and of Economic Analysis; and the US Department of Health and Human Services, Social Security Administration

have had life-histories significantly different from older Americans today. They will be better educated and healthier, and will have a far higher share of women retired from work than is currently the case. It is extremely difficult to predict whether this effect will result in new spending patterns.<sup>46</sup> Similarly, America's ethnic composition will change. Between now and 2000, roughly one-half of the increase in the U.S. population will be from minority ethnic groups.<sup>47</sup> These developments pose problems for analyzing future spending patterns, because it is nearly impossible to allow for the effects of changing ethnic composition.

For these and many other reasons already discussed, trends can be misleading during periods of fundamental change. The new environment in which the economy operates allows for a number of major shifts in the way households elect to achieve amenity through private and public choice. Given the wide array of possible choices, and the enormous range of uncertainties about the cost and capability of emerging technology, there is no completely satisfactory method for outlining the possibilities, nor any mathematical technique for producing them.

Potential changes are represented through an illustrative set of "Alternative" scenarios, which will be developed further in chapter 3. These scenarios were designed with the help of individuals familiar with the operation of the eight major amenity categories (Food, Health, Education, etc.), who were charged with describing a way that new technology *could* lead to a significant increase in productivity during the next 20 years given appropriate changes in regulation, information flows, and other factors. Along with the Trend scenarios, the Alternatives share common assumptions about such factors as population growth, rates of consumer household formation, and rates of income and GNP growth (see box 2-B and the appendix for details).

<sup>46</sup>William Lazer and Eric H. Shaw, "How Older Americans Spend Their Money," *American Demographics*, September 1987, p. 41.

<sup>47</sup>U.S. Bureau of the Census, *Statistic/Abstract of the United States: 1987* (107th ed.), Washington, DC, 1986. Changing ethnic composition, of course, has occurred for some time; the U.S. Bureau of the Census has recently reported that the U.S. Hispanic population has increased by 30 percent since 1980, as opposed to a 6-percent increase in the non-Hispanic population. See U.S. Bureau of the Census, "The Hispanic Population in the United States: March 1986 and 1987," Current Population Reports, Series P-20, No. 416, Washington, DC, August 1987.

Given these scenarios, two patterns of national income growth are examined: a pessimistic assumption, represented by 1.5 percent annual growth in GNP (as in the late 1970s and early 1980s); and an optimistic assumption, represented by 3 percent per year GNP growth. This range is plainly not meant to be a forecast, but rather is designed to bracket a wide yet reasonable range of possibilities.

In principle, it is possible to develop a closed, internally consistent model that can accommodate these connections. It proves extremely difficult to use such models in practice when exploring the possibility of significant changes in technology or in private and public management during a period of 20 years. While the analysis presented throughout this work is consistent in that the income generated by output is equal to the money spent on final and intermediate products, it is not based on a closed model of the economy.<sup>48</sup>

### **Summarizing the Results**

The scenarios are summarized in table 2-9; chapter 3 and the appendix provide further detail. The proportion of expenditure on Food goes down no matter what growth rate or assumption about technology is used—as does, to a lesser extent, that spent on Transportation. On the other hand, more is spent on Recreation and Leisure in all cases, and both Clothing and Personal Care (mostly clothing) and Personal Business and Communication gain in all but the 1.5 percent Trend scenario (in which they hold the same share as 1983).

Considering first the 3 percent scenarios, Food purchases are expected to decline as a fraction of all spending, though more slowly than in the past largely because of an increase in the proportion of more expensive food eaten away from home. The Trend and Alternative scenarios differ considerably in estimates of future Health spending. The Trend assessment shows spending for Health reaching 14 percent of the total in 2005 while the Alternative scenario suggests 11 percent, due to greater reliance on preventative (as opposed to curative) techniques.

<sup>48</sup>Consistent sets of forecasts were developed by beginning with rough estimates of structural change in production and productivity, using the resulting GNP growth to estimate purchasing, and then using this purchasing to estimate production and GNP. The estimates are combined explicitly in ch. 13.

## Box 2-B.—Basic Strategies in Developing Scenarios

### 1. *Demographics*

**Population** was forecast using a version of the projection model used by the U.S. Social Security Administration] modified for use on a personal computer.<sup>2</sup> The projection includes an allowance for illegal immigration somewhat higher than that used by the U.S. Bureau of Census' "middle series."<sup>3</sup> For more detail, see the appendix.

Estimates of the number of people in each age group can be converted to estimates of household types given assumptions about future marriage and divorce rates. Annual marriage rates have remained within ranges of 9.9 to 10.9 per thousand since 1968, and of 10.2 to 10.6 since 1978. Annual divorce rates, after rising consistently between 1960 and 1979, have since remained fairly constant at around 5.0 per thousand. The hypothesis used here is that these recent steady rates will continue into the foreseeable future. Assuming that the likelihood that a person of a given age and sex becomes a member of any one type of household is the same in the year 2005 as it was in 1984, the number and type of future households can then be calculated (see table 2-4).<sup>4</sup>

### 2. *GNP Growth*

Two rates of gross national product (GNP) growth are considered, one based on the optimistic assumption that rates of productivity growth characterizing the years 1965 to 1975 can be recovered, and one based on the assumption that productivity would grow at the much slower 1975 to 1985 rates. Together with assumptions about size of the work force and other factors (discussed in more detail in ch. 13), these result in GNP growth rates of approximately 1.5 and 3 percent per year.

### 3. *Allocating GNP to Consumption*

All the cases considered in this analysis share the assumption that the sum of personal consumption and government spending will remain at a constant share of 85 percent of GNP. This ratio has not varied by more than 3 percentage points for nearly 30 years. Personal consumption expenses have fluctuated in recent years from a low of 61.5 percent of GNP in 1973 to a high of 65.5 percent in 1983, and have since remained around 65 percent. The analysis also assumes that defense will maintain its present 7 percent share of GNP.<sup>5</sup>

### 5. *Prices*

Relative prices are assumed to change at roughly the rate of the past two decades, with exceptions based on changes in trade and production technology discussed in the appendix. The set is made consistent in the sense that a shift to the new price set would not change total spending.

### 6. *Allocating Consumption by Product Type*

With the exceptions discussed in the text, money available for consumption is assumed to be allocated given estimates of price, income, and household size using the methods described to produce table 2-9. The calculations are based on an analysis of spending by income cohort and household type.<sup>6</sup> They are *not* based on an assumption that spending rises or falls exponentially with income, but allow for more complex relationships. For example, spending on used cars first rises and then falls as incomes increase.<sup>7</sup>

<sup>2</sup>The assumptions on life expectancy and fertility used here have been selected from the ranges developed by the Social Security Administration (SSA); see U.S. Department of Health and Human Services, Social Security Administration, "Social Security Area Population Projections, 1984," Actuarial Study No 92, Washington, DC, May 1984.

<sup>3</sup>"Modified Social Security Population Projection Program," working paper prepared for the Office of Technology Assessment, November 1985.

<sup>4</sup>Frank D. Bean, et al., "Projections of Net Legal and Illegal Immigration to the United States," contract paper prepared for the Office of Technology Assessment by the Population Research Center, University of Texas, Austin, TX, August 1984.

<sup>5</sup>The model from which these results were obtained used the Current Population Survey for 1984, and weights assigned to individuals of each age and sex cohort for each of 17 household types. See "Household Formation Program," working paper prepared for the Office of Technology Assessment, Washington, DC, May 1986. The 17 household types were then aggregated into the 11 categories presented in tables 2-4 and 2-5.

<sup>6</sup>As a fraction of GNP, Federal defense spending has followed a down-and-up curve over the past 25 years—falling steadily (with the exception of the Viet Nam War years of 1965 to 1968) from 9.7 percent in 1960 to 4.9 percent in 1979, only to rise rapidly through 1983 to a level of nearly 7 percent, where it has remained since. This analysis therefore assumes that a 7 percent average, which is both close to the present figure and the approximate mid-point in the historical trend, will hold over the next two decades. For an annual series of defense spending as a fraction of GNP, see U.S. Bureau of the Census, *Statistical Abstract of the United States: 1986* (106th ed.), Washington, DC, 1985, table 540.

<sup>7</sup>See "Consumer Expenditure Demand Projection Program," working paper prepared for the Office of Technology Assessment, April 1986.

<sup>8</sup>The equation linking spending to income is quadratic.

**Table 2-9.—Spending on the Amenities: 1983 and the Scenarios  
(in percent of personal and total spending in 1983 dollars)**

	1983		year 2005							
	PCE	Total	Trend 3%		Trend 1.5%/0		ALT 3%		ALT 1.50/0	
			PCE	Total	PCE	Total	PCE	Total	PCE	Total
Food . . . . .	200/0	16%	16%	13% <sup>0</sup>	19%	15%	16%	12%	16%	13%
Housing . . . . .	26	20	25	19	27	21	23	18	23	18
Transportation . . . . .	13	12	11	10	11	11	10	10	11	11
Health . . . . .	12	11	15	14	14	13	12	11	13	13
<b>Clothing and Personal</b>										
Care . . . . .	9	7	11	8	9	7	12	9	11	8
Education . . . . .	2	7	1	5	1	6	1	6	2	7
<b>Personal Business and</b>										
Communication . . . . .	8	6	9	7	8	6	11	8	10	7
Recreation and Leisure. . . . .	10	8	13	10	11	9	15	12	14	11
Defense . . . . .	0	7	0	7	0	7	0	7	0	7
<b>Other Government</b>										
Expenditure . . . . .	0	5	0	7	0	6	0	6	0	4
<b>Total (percent)</b> . . . . .	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
(\$1983 billion) . . . . .	2,229	2,905	4,270	5,565	3,093	4,031	4,270	5,565	3,093	4,031

NOTE: Total includes all government purchases of goods and services. ALT - Alternatives (see text for definitions). Totals may not add to 100 due to rounding.

SOURCE: 1983 statistics from U.S. Department of Commerce, Bureau of Economic Analysis, "National Income and Product Accounts," Survey of Current Business, table 2.4; Trend projections drawn from U.S. Congress, Office of Technology Assessment, "Consumer Expenditure Demand Projection Program," April 1986, based on data provided in the "Consumer Expenditure Survey," U.S. Department of Labor, Bureau of Labor Statistics (see the appendix for details); Alternatives from the Office of Technology Assessment.

The share of Housing also differs between the two 3 percent scenarios, being 1 percent lower in the Alternative than in the Trend. This is due to the assumed sharp fall in the cost of household energy utilities, and to an assumption that real shelter costs can be kept at 1970 levels using technical improvements in the production and operation of homes.

The shares of income spent for Personal Business and Communication, Recreation and Leisure, and Clothing and Personal Care are all higher in the Alternative scenario. In the case of Personal Business and Communication, the difference is created by greater use of both the telephone and services outside the house. Similarly, the Alternative assumes that technology allows for an expansion of recreational telephone use, and of the information, educational, and entertainment resources available in the home through television and computers. The Alternative case also envisions a 15 percent drop in the real price of clothing, which boosts spending considerably. Overall, as might be expected, the 3 percent Alternative case differs most from 1983 in terms of distribution of personal spending, since high economic growth is combined with liberal assumptions about the impact of technology on purchasing patterns.

In the low growth (1.5 percent) scenarios, the Trend patterns are quite similar to those of 1983. Food expenditures are lower in the Alternative case than in the Trend, despite generous assumptions about family diet. The share of Housing falls even more sharply in the Alternative, largely due to the reasons given for the 3 percent cases. On the other hand, expenditures on Recreation and Leisure are distinctly higher in the Alternative, in which new technologies allow for an expansion of entertainment products and services at lower prices—making a wide range of entertainment resources available to all. Government spending as a whole (counting all public expenditures on the amenities) increases somewhat more rapidly in the Alternative case than the Trend, primarily because of assumed increases in spending on education.

The statistics just discussed do not directly address some of the most critical questions. What, for example, will happen to the real quality of housing, to the flexibility and convenience of transportation, or to the state of American health in these scenarios? To what extent will future changes in consumer demand bring real improvements in amenity to the lives of Americans? Such questions cannot be answered with precision. To the extent that it is possi-

ble to talk in terms of quality as well as quantity, the discussion of changes in amenity will be approached on a sector-by-sector basis in chapter 3. If nothing else, a patient insistence that economic

progress be clearly linked to an improvement in amenity provides a focus for the abstract calculus of productivity and technology that is the subject of much of this report.