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Chapter Author: Dale Jorgenson, Barbara M. Fraumeni

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# 5 The Accumulation of Human and Nonhuman Capital, 1948–84

Dale W. Jorgenson and Barbara M. Fraumeni

## 5.1 Introduction

The objective of this paper is to present a new system of national accounts for the U.S. economy. The purpose of this accounting system is to provide a comprehensive perspective on the role of capital formation in U.S. economic growth. The distinctive feature of our system is that we include fully comparable measures of investment in human and nonhuman capital. We have implemented this system of accounts for the private sector of the U.S. economy, covering the period 1948–84.

The concept of human capital is based on an analogy between investment in physical capital and investment in human beings. The common element is that present expenditures yield returns over the future. In order to construct comparable measures of investment in human and nonhuman capital, we define human capital in terms of lifetime labor incomes for all individuals in the U.S. population. Lifetime labor incomes correspond to the asset values for investment goods used in accounting for physical or nonhuman capital. We present a summary of our methodology in section 5.2.

The U.S. national income and product accounts (NIPAs) contain a great deal of valuable information on capital formation. For example, these accounts provide data on investment in physical or nonhuman capital that are both comprehensive and detailed;<sup>1</sup> however, the national accounts are closely tied to market transactions, avoiding imputations

Dale W. Jorgenson is Frederic Eaton Abbe Professor of Economics at Harvard University. Barbara M. Fraumeni is an associate professor of economics at Northeastern University.

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for nonmarket activities wherever possible. Not surprisingly, investment in human capital is not included in the U.S. national accounts.

The perspective on capital formation provided by the U.S. national accounts is seriously incomplete, as a consequence of the fact that these accounts are limited to market transactions. Our measures of capital formation show that investment in human capital is at least four times the magnitude of investment in nonhuman capital; moreover, the value of wealth in the form of human capital is over eleven times the value of physical or nonhuman capital.

The total product of an economic system includes investment in human and nonhuman capital and consumption of market and nonmarket goods and services. We define full consumption as the sum of goods and services supplied by market and nonmarket activities. Similarly, we define full investment as the sum of investments in human and nonhuman capital. Finally, we define full product as the sum of investment and consumption. We present measures of full product, investment, and consumption in section 5.3.

Our system of accounts assigns an equal role to consumption and investment as proportions of the national product; however, the relative importance of investment is much greater in our system than in the U.S. national accounts. Full investment is around 50 percent of full product, where human and nonhuman capital are treated on a comparable basis. Full consumption is about half of full product, where both market and nonmarket goods and services are included in consumption.

The value of full product is equal to the value of outlays on the services of human and nonhuman capital. These outlays take the form of labor and property compensation. We define full labor compensation as the sum of market labor compensation for activities involving employment through the labor market and nonmarket labor compensation for activities resulting in investment in education and direct consumption of labor services. Similarly, we define full property compensation as the sum of market and nonmarket property compensation. Finally, we define full factor outlay as the sum of labor and property compensation. We present measures for full factor outlay, labor compensation, and property compensation in section 5.3.

Nonmarket labor compensation is more than 80 percent of labor compensation since full compensation includes the value of nonmarket activities such as investment in education, household production, and leisure time. Full labor compensation is around 90 percent of factor outlay, while property compensation is close to 10 percent of the total. In our system of national accounts, the relative importance of labor compensation is much greater than in the U.S. national accounts.

Both property and labor compensation must be reduced by taxes and increased by subsidies to obtain incomes accruing to individuals. We define full labor income as the sum of market and nonmarket labor compensation after taxes. Similarly, we define full property income as the sum of market and nonmarket property compensation after taxes. Full income is defined as the sum of labor income and property income. We present measures for full income, labor income, and property income in section 5.4.

Receipts accruing to individuals include full income and government transfer payments to persons. Receipts are divided between consumption of market and nonmarket goods and services and saving in the form of human and nonhuman capital. We define full personal consumption expenditures as the sum of market goods and services consumed by households and nonprofit institutions, the services of human capital consumed directly through household production and leisure, and the services of nonhuman capital consumed directly in the form of services of consumers' durables and owner-occupied housing. We define full consumer outlays as the sum of personal consumption expenditures, personal transfer payments to foreigners, and personal non-tax payments. We present measures for full consumer outlays and saving in the form of human and nonhuman capital in section 5.4.

Since our system of accounts includes the consumption of both market and nonmarket goods and services, consumer outlays are much greater than in the U.S. national accounts. The market share of consumer outlays averages around 35 percent of total outlays. Similarly, our concept of human and nonhuman saving is much more comprehensive than the concept of saving in the U.S. national accounts. Human saving is between 80 and 90 percent of full saving. Nonhuman saving, the only portion included in the U.S. national accounts, is between 10 and 20 percent of the total.

The proportion of full saving to national expenditure ranges from 45 to 50 percent in our accounting system. This is far greater than the proportion of national saving to national expenditure in the U.S. national accounts. The saving proportion in our accounts rose to a peak in the year 1971 and has been gradually declining since then. The saving rate is lower in 1983 and 1984 than at any previous time in the postwar period.

To integrate our measures of income and expenditure with measures of human and nonhuman wealth, we require concepts of depreciation and revaluation for human and nonhuman capital. We define depreciation of human capital in terms of changes in the lifetime labor incomes of individuals with age. Depreciation on human capital is the sum of changes in lifetime labor incomes with age for all individuals who remain

in the population and lifetime labor incomes of all individuals who die or emigrate. Similarly, we define depreciation for nonhuman capital in terms of changes in asset values with age. Depreciation on nonhuman capital is the sum of changes in asset values for all investment goods remaining in the capital stock and the asset values of all investment goods that are retired from the capital stock. We define full depreciation as the sum of depreciation for human and nonhuman capital.

Depreciation is a very large component of saving in the form of both human and nonhuman capital. Depreciation was a fairly stable proportion of full gross saving at around 35 percent until the mid-1960s. Since that time, the relative importance of depreciation has risen steadily to almost 50 percent of saving. By contrast, net saving has declined from nearly 65 percent of saving at the beginning of the postwar period to slightly over 50 percent at the end of the period.

We define revaluation for human capital in terms of changes in lifetime labor incomes from period to period for individuals with a given set of demographic characteristics—age, sex, and education. Revaluation of human wealth is the sum of changes in lifetime incomes for all individuals initially in the population, holding age, sex, and education for each individual constant. Similarly, we define revaluation for nonhuman capital in terms of changes in asset values from period to period for individual investment goods. Revaluation of nonhuman capital is the sum of changes in asset values for all investment goods initially in the capital stock, holding the age of each investment good constant. We define full revaluation as the sum of revaluation for human and nonhuman capital.

We conclude the development of a new system of national accounts for the United States by defining full wealth as the sum of human and nonhuman wealth. The change in wealth from period to period is the sum of investment in human and nonhuman capital, net of depreciation, and the revaluation of human and nonhuman capital. We present measures of full investment, depreciation, revaluation, and changes in wealth in section 5.5 below. Finally, we present measures of full wealth in section 5.5.

Human wealth greatly predominates in the value of wealth, amounting to more than 90 percent of the total throughout the postwar period. The U.S. national accounts do not include wealth accounts. Only investment in the form of physical or nonhuman wealth is included in the national accounts. Wealth accounts consistent with the U.S. national accounts would exclude human wealth altogether. Obviously, the exclusion of investment in the form of human wealth is an extremely important omission.

It is necessary to emphasize that our study is exploratory in character. Unlike the U.S. national accounts, which are firmly rooted in

market transactions, our system of accounts involves very sizable imputations for the value of nonmarket activities. This disadvantage must be weighed against the important advantage that we provide a comprehensive view of capital formation. Judgments about the relative importance of investment and consumption, labor and property income, or different forms of saving require information of the type presented in our new system of national accounts.

## 5.2 Methodology

The implementation of our system of accounts for human capital requires a new data base for measuring lifetime labor incomes for all individuals in the U.S. population.<sup>2</sup> Our system includes demographic accounts that incorporate population data from the U.S. Bureau of the Census. Our demographic accounts include annual estimates of mid-year population by sex and age for individuals under seventy-five years of age. Using data from the censuses of population for 1940, 1950, 1960, 1970, and 1980, we have distributed the population of each sex by individual years of age and individual years of educational attainment. The estimation of changes in the numbers of individuals classified by age, sex, and education from year to year requires data on enrollment in formal schooling and on births, deaths, and migration.<sup>3</sup>

The starting point for the measurement of lifetime labor incomes for all individuals in the U.S. population is the data base on market labor activities assembled by Gollop and Jorgenson (1980, 1983). This data base includes the number of employed persons, hours worked, and labor compensation for the United States on an annual basis, cross-classified by sex, age, education, employment class, occupation, and industry. We have derived annual estimates of hours worked and labor compensation required for measuring incomes from market labor activities by summing over employment class, occupation, and industry and by distributing the work force of each sex by individual years of age from fourteen to seventy-four and individual years of educational attainment from no education to one to seventeen or more. We obtain average hourly labor compensation annually for individuals classified by the two sexes, sixty-one age groups, eighteen education groups for a total of 2,196 groups by dividing market labor compensation by hours worked by each group.

The second step in the measurement of lifetime labor incomes is to impute labor compensation and hours devoted to nonmarket activities. Six types of nonmarket activities are commonly distinguished in studies of time allocation—production of goods and services within the household unit, volunteer work outside the household unit, commuting to work, formal education, leisure, and the satisfaction of physiological

needs such as eating and sleeping.<sup>4</sup> We classify time spent satisfying physiological needs as maintenance and exclude this time from our measure of time spent in nonmarket activities. We assume that the time available for all market and nonmarket activities has been constant over time and is equal to fourteen hours per day for all individuals.

We allocate the annual time available for all individuals in the population among work, schooling, household production and leisure, and maintenance. Our system of demographic accounts includes the enrollment status for individuals of each sex between five and thirty-four years of age. We estimate the time spent in formal schooling for all individuals by assigning 1,300 hours per year to each person enrolled in school. We allocate time spent in schooling to investment. Similarly, our demographic accounts include employment status for individuals of each sex between fourteen and seventy-four years of age. Hours worked for all employed individuals, classified by sex, age, and education, are included in our data base for market labor activities. We allocate time that is not spent working or in formal schooling directly to consumption. For all individuals, this time is equal to the difference between fourteen hours per day and time spent working or in school.

The third step in the measure of lifetime labor incomes is to impute the value of labor compensation for nonmarket activities.<sup>5</sup> For this purpose, we first obtain average hourly labor compensation for all employed persons classified by sex, age, and education from our data base for market labor activities. Second, we estimate marginal tax rates for all employed persons, again classified by sex, age, and education. We multiply compensation per hour by one minus the marginal tax rate to obtain imputed hourly labor compensation for nonmarket activities other than formal schooling. Since individuals under fourteen years of age do not participate in the labor force, their imputed hourly labor compensation is set equal to zero. Individuals over seventy-four years of age are also assigned zero as their hourly labor compensation.

To estimate lifetime labor incomes for all individuals in the U.S. population, we distinguish among three stages in the life cycle. In the first stage, individuals may participate in formal schooling but not in the labor market. In the second stage, individuals may enroll in school and also work. In the third stage, individuals may participate in the labor market but not in formal schooling. For individuals in the third stage of the life cycle, total labor compensation is the sum of compensation for market labor activities after taxes and imputed compensation for nonmarket labor activities. For individuals in the second stage of the life cycle, total labor compensation also includes imputed labor compensation for schooling. For individuals in the first stage of the life cycle, labor compensation includes only the imputed value of time spent in schooling.

For an individual in the third stage of the life cycle, we assume that expected incomes in future time periods are equal to the incomes of individuals of the same sex and education, but with the age that the individual will have in the future time period, adjusted for increases in real income. We assume that real incomes rise over time at the rate of Harrod-neutral technical change, which we estimate at 2 percent per year. We weight income for each future year by the probability of survival, given the initial age of the individual. We obtain these probabilities by sex from publications of the National Center for Health Statistics. Where necessary, these survival functions, giving probability of survival by age and sex, are interpolated by means of standard demographic techniques. Finally, we discount expected future incomes at a real rate of return of 4 percent per year to obtain the lifetime labor income of an individual of a given sex, age, and education.

For an individual at the second stage of the life cycle, combining formal schooling with the possibility of participation in the labor market, we impute the value of time spent in schooling through its effect on lifetime labor income. For an individual of a given sex and age who is completing the highest level of schooling, grade seventeen or over, lifetime labor income is the discounted value of expected future labor incomes for a person of that sex and age and seventeen or more years of schooling. The imputed labor compensation for the time spent in formal schooling is equal to the difference between the lifetime labor incomes of an individual with seventeen years of education and an individual with the same sex and age and one less year of education, less tuition and fees for that grade of schooling. Total labor compensation is equal to the value of time spent in formal schooling plus labor compensation for market and nonmarket activities other than formal schooling.

For an individual completing grade 16, lifetime labor income is equal to the lifetime labor income of an individual of the same sex and education, but one year older, plus expected labor compensation for one year, discounted back to the present and multiplied by the probability of survival for one year. Expected labor compensation is equal to the probability of enrollment in grade 17 or higher, multiplied by market and nonmarket labor compensation for a person enrolled in that grade, and one minus the probability of enrollment, multiplied by market and nonmarket labor compensation for a person with sixteen years of education, not enrolled in school. As before, the imputed labor compensation for the time spent in formal schooling is equal to the difference between the lifetime incomes of an individual with sixteen years of education and an individual with the same sex and age and one less year of education, less tuition and fees. Using the same approach to defining lifetime labor incomes for individuals completing earlier grades,



lifetime incomes and imputed labor compensation for the time spent in formal schooling can be determined for individuals completing fifteen years of education, fourteen years of education, and so on.

For an individual in the first stage of the life cycle, where participation in the labor market is ruled out, the value of labor compensation is limited to the imputed value of schooling. Lifetime incomes for individuals at this stage of the life cycle can be determined for individuals completing one year of education, two years of education, and so on, working back from higher levels of education as outlined above. For individuals too young to be enrolled in school, imputed labor compensation is zero, but lifetime labor incomes are well defined. The value of a newborn entrant into the population is equal to the lifetime labor income of that individual at age zero. Investment in human capital in any year is the sum of lifetime incomes for all individuals born in that year and all immigrants plus the imputed labor compensation for formal schooling for all individuals enrolled in school.

The implementation of our new system of national accounts for the United States begins with the accounting system presented by Fraumeni and Jorgenson (1980). That accounting system includes a production account, an income and expenditure account, an accumulation account, and a wealth account—all in current and constant prices;<sup>6</sup> however, their accounts for capital services, investment, and wealth are limited to nonhuman capital. We have incorporated their estimates for nonhuman capital into our system of U.S. national accounts. We have added estimates of the services of human capital, investment in human capital, and human wealth.

Our system of U.S. national accounts includes a production account that divides the national product between investment and consumption and divides national factor input between the services of human and nonhuman capital. The system also includes an income and expenditure account that divides income between compensation for human and nonhuman capital services and divides expenditures between saving and current consumption. Changes in wealth are divided between investment and revaluation of human and nonhuman capital in an accumulation account. The system is completed by a wealth account incorporating human and nonhuman wealth.

As a basis for comparison of measurements of human capital based on lifetime labor incomes with alternative approaches, we can compare our estimates of human wealth and investment in human capital with those of Kendrick (1976). Like Machlup (1962), Nordhaus and Tobin (1972), Schultz (1961), and others, Kendrick employs costs of education, including earnings forgone by students, as a basis for measuring investment through education. He employs costs of rearing as a basis

for measuring investment through addition of new members of the population. Since his estimates of human capital are based on costs of education and rearing rather than lifetime labor incomes, he omits the value of nonmarket activities from his estimates of human capital. Our estimates of human capital are much larger than those of Kendrick. Our estimates of nonhuman wealth are also higher than Kendrick's, and our estimates of total wealth are much higher than his.<sup>7</sup>

### **5.3 Production**

In implementing our production account for the United States, we limit our attention to the private domestic sector of the U.S. economy, following Fraumeni and Jorgenson (1980). The total product of the private domestic sector of the U.S. economy includes investment in human and nonhuman capital and consumption of market and nonmarket goods and services. We add to consumption of market goods and services, as defined by Fraumeni and Jorgenson, our estimates of consumption of nonmarket goods and services. Similarly, we add to their estimates of investment in nonhuman capital our estimates of investment in human capital.

The value of total product is equal to the value of total factor outlay for the production account. Total factor outlay in the U.S. economy includes market labor compensation for activities involving employment through the labor market and nonmarket labor compensation for activities resulting in investment in education and direct consumption of labor services. We add to market labor compensation, as defined by Fraumeni and Jorgenson (1986), our estimates of the value of nonmarket labor compensation. We incorporate their estimates of property compensation into our factor outlay account.

We present the production account in current prices for the private domestic sector of the U.S. economy for the year 1982 in table 5.1. We first observe that the value of time spent in household production and leisure, which is assigned to consumption, is larger than the gross private domestic product, as defined by Fraumeni and Jorgenson. The value of investment in human capital is comparable in magnitude to gross private domestic product. Considering the value of time spent in household production and leisure and investment in human capital together, we find that outlay on human capital services is more than twice the size of gross private domestic factor outlay, as defined by Fraumeni and Jorgenson.

Our next objective is to allocate the value of total product for the private domestic sector of the U.S. economy between consumption and investment for the period 1948–84. We first estimate the value of

**Table 5.1**                    **Production Account, Gross Private Domestic Product and Factor Outlay, United States, 1982 (billions of current dollars)**

| Product       |   |                |
|---------------|---|----------------|
| 1.            | Private gross national product (table 1.7, line 1 minus line 12)                                | 2,822.1        |
| 2.            | - Compensation of employees in government enterprises (table 6.4, lines 81, 86)                 | 39.6           |
| 3.            | - Rest-of-the-world gross national product (table 1.7, line 15)                                 | 51.2           |
| 4.            | - Federal indirect business tax and nontax accruals (table 3.2, line 9)                         | 48.1           |
| 5.            | + Capital stock tax (table 3.1, n. 2)   | ...            |
| 6.            | - State and local indirect business tax and nontax accruals (table 3.3, line 7)                 | 210.8          |
| 7.            | + Business motor vehicle licenses (table 3.5, line 25)  | 2.1            |
| 8.            | + Business property taxes (table 3.3, line 9)   | 85.3           |
| 9.            | + Business other taxes (table 3.5, lines 26, 27)  | 14.8           |
| 10.           | + Subsidies less current surplus of federal government enterprises (table 3.2, line 27)         | 16.0           |
| 11.           | + Subsidies less current surplus of state and local government enterprises (table 3.3, line 22) | -7.3           |
| 12.           | + Imputation for nonhuman capital services  | <u>338.7</u>   |
| 13.           | = Gross private domestic product  | 2,921.9        |
| 14.           | + Time in household production and leisure  | 3,944.5        |
| 15.           | + Investment in human capital   | <u>4,568.6</u> |
| 16.           | = Full gross private domestic product   | 11,435.0       |
| Factor Outlay |   |                |
| 1.            | Capital consumption allowances (table 1.9, line 2)  | 383.2          |
| 2.            | + Business transfer payments (table 1.9, line 7)  | 14.3           |
| 3.            | + Statistical discrepancy (table 1.9, line 8)   | -.1            |
| 4.            | + Certain indirect business taxes (product account above, 5 + 7 + 8 + 9)                        | 102.2          |
| 5.            | + Income originating in business (table 1.12, line 14)  | 2,010.6        |
| 6.            | - Compensation of employees in government enterprises (table 6.4, lines 81, 86)                 | 39.6           |
| 7.            | + Income originating in households and institutions (table 1.12, line 19)                       | 112.7          |
| 8.            | + Imputation for nonhuman capital services  | <u>338.7</u>   |
| 9.            | = Gross private domestic factor outlay  | 2,921.9        |
| 10.           | + Imputations for human capital services (14 + 15 above)  | <u>8,513.1</u> |
| 11.           | = Full gross private domestic factor outlay   | 11,435.0       |

*Note:* All table references are to the NIPA tables in the March 1986 *Survey of Current Business*, with the exception of capital stock tax, which refers to Bureau of Economic Analysis (1966).

investment in human and nonhuman capital for all years. The value of investment in human capital is equal to the value of investment in education and the value of new members of the population resulting from births and migration. Our estimates of investment in nonhuman capital are based on those of Fraumeni and Jorgenson. We present estimates of investment in human capital, investment in nonhuman

capital, and full investment in current prices in table 5.2 and in constant prices in table 5.3.

The value of investment in human capital is by far the largest part of full investment, varying from 0.812 to 0.869 as a proportion of investment during the period 1948–84. The share of investment in nonhuman capital fell over the period from 0.166 in 1948 to 0.131 in 1971. The nonhuman share then rose to 0.167 in 1984, almost the same level as in 1948. The price of investment in human capital has risen much more rapidly than the price of investment in nonhuman capital. By

**Table 5.2 Full Investment (billions of current dollars)**

| Year | Full Investment | Human Investment | Nonhuman Investment | Human Share | Nonhuman Share |
|------|-----------------|------------------|---------------------|-------------|----------------|
| 1948 | 471.0           | 392.9            | 78.1                | .834        | .166           |
| 1949 | 488.4           | 415.5            | 72.9                | .851        | .149           |
| 1950 | 536.5           | 441.3            | 95.2                | .823        | .177           |
| 1951 | 587.8           | 477.2            | 110.5               | .812        | .188           |
| 1952 | 619.9           | 508.9            | 111.0               | .821        | .179           |
| 1953 | 679.9           | 563.7            | 116.3               | .829        | .171           |
| 1954 | 720.7           | 607.6            | 113.0               | .843        | .157           |
| 1955 | 768.1           | 635.9            | 132.3               | .828        | .172           |
| 1956 | 816.7           | 678.6            | 138.1               | .831        | .169           |
| 1957 | 896.4           | 755.2            | 141.2               | .843        | .157           |
| 1958 | 951.4           | 819.5            | 132.0               | .861        | .139           |
| 1959 | 997.4           | 846.5            | 150.9               | .849        | .151           |
| 1960 | 1,034.5         | 884.7            | 149.8               | .855        | .145           |
| 1961 | 1,102.9         | 952.5            | 150.4               | .864        | .136           |
| 1962 | 1,163.8         | 996.1            | 167.7               | .856        | .144           |
| 1963 | 1,209.6         | 1,031.3          | 178.3               | .853        | .147           |
| 1964 | 1,331.1         | 1,140.5          | 190.6               | .857        | .143           |
| 1965 | 1,406.9         | 1,193.2          | 213.7               | .848        | .152           |
| 1966 | 1,504.6         | 1,268.3          | 236.3               | .843        | .157           |
| 1967 | 1,596.1         | 1,355.7          | 240.4               | .849        | .151           |
| 1968 | 1,728.5         | 1,466.7          | 261.8               | .849        | .151           |
| 1969 | 1,864.0         | 1,582.9          | 281.0               | .849        | .151           |
| 1970 | 2,074.1         | 1,796.2          | 277.9               | .866        | .134           |
| 1971 | 2,335.9         | 2,029.6          | 306.3               | .869        | .131           |
| 1972 | 2,413.7         | 2,068.3          | 345.5               | .857        | .143           |
| 1973 | 2,568.9         | 2,170.2          | 398.7               | .845        | .155           |
| 1974 | 2,809.0         | 2,397.1          | 411.9               | .853        | .147           |
| 1975 | 3,143.7         | 2,722.2          | 421.5               | .866        | .134           |
| 1976 | 3,316.0         | 2,817.4          | 498.5               | .850        | .150           |
| 1977 | 3,626.9         | 3,047.3          | 579.6               | .840        | .160           |
| 1978 | 3,794.1         | 3,121.1          | 673.0               | .823        | .177           |
| 1979 | 4,287.2         | 3,545.2          | 741.9               | .827        | .173           |
| 1980 | 4,724.9         | 3,974.7          | 750.1               | .841        | .159           |
| 1981 | 5,129.4         | 4,289.4          | 839.9               | .836        | .164           |
| 1982 | 5,354.4         | 4,568.6          | 785.8               | .853        | .147           |
| 1983 | 5,701.5         | 4,843.1          | 858.4               | .849        | .151           |
| 1984 | 6,153.2         | 5,123.2          | 1,030.0             | .833        | .167           |

Table 5.3 Full Investment (billions of constant dollars)

| Year | Full Investment |       | Human Investment |       | Nonhuman Investment |       |
|------|-----------------|-------|------------------|-------|---------------------|-------|
|      | Quantity        | Price | Quantity         | Price | Quantity            | Price |
| 1949 | 2,899.1         | .168  | 2,669.1          | .156  | 282.0               | .259  |
| 1950 | 3,025.0         | .177  | 2,686.5          | .164  | 353.8               | .269  |
| 1951 | 3,144.1         | .187  | 2,756.9          | .173  | 389.3               | .284  |
| 1952 | 3,207.0         | .193  | 2,812.6          | .181  | 396.8               | .280  |
| 1953 | 3,293.1         | .206  | 2,878.3          | .196  | 414.0               | .281  |
| 1954 | 3,349.0         | .215  | 2,956.1          | .206  | 400.5               | .282  |
| 1955 | 3,487.9         | .220  | 3,032.9          | .210  | 450.0               | .294  |
| 1956 | 3,552.8         | .230  | 3,106.6          | .218  | 446.1               | .310  |
| 1957 | 3,658.0         | .245  | 3,226.6          | .234  | 439.3               | .321  |
| 1958 | 3,706.2         | .257  | 3,312.7          | .247  | 412.5               | .320  |
| 1959 | 3,805.1         | .262  | 3,356.2          | .252  | 458.0               | .330  |
| 1960 | 3,872.9         | .267  | 3,438.3          | .257  | 448.9               | .334  |
| 1961 | 3,991.1         | .276  | 3,556.0          | .268  | 452.6               | .332  |
| 1962 | 4,091.0         | .284  | 3,606.4          | .276  | 495.2               | .339  |
| 1963 | 4,209.2         | .287  | 3,694.2          | .279  | 523.0               | .341  |
| 1964 | 4,338.5         | .307  | 3,790.0          | .301  | 553.9               | .344  |
| 1965 | 4,402.0         | .320  | 3,797.7          | .314  | 604.2               | .354  |
| 1966 | 4,443.3         | .339  | 3,786.3          | .335  | 652.6               | .362  |
| 1967 | 4,508.5         | .354  | 3,851.1          | .352  | 653.3               | .368  |
| 1968 | 4,625.5         | .374  | 3,941.8          | .372  | 679.2               | .385  |
| 1969 | 4,767.4         | .391  | 4,072.2          | .389  | 690.9               | .407  |
| 1970 | 4,876.0         | .425  | 4,218.3          | .426  | 654.6               | .425  |
| 1971 | 5,020.9         | .465  | 4,335.4          | .468  | 682.4               | .449  |
| 1972 | 5,010.3         | .482  | 4,268.6          | .485  | 741.0               | .466  |
| 1973 | 5,066.4         | .507  | 4,240.4          | .512  | 829.1               | .481  |
| 1974 | 5,045.1         | .557  | 4,253.6          | .564  | 792.4               | .520  |
| 1975 | 5,046.8         | .623  | 4,323.7          | .630  | 718.7               | .587  |
| 1976 | 5,124.4         | .647  | 4,328.4          | .651  | 794.7               | .627  |
| 1977 | 5,286.1         | .686  | 4,418.0          | .690  | 868.6               | .667  |
| 1978 | 5,385.0         | .705  | 4,447.7          | .702  | 938.0               | .718  |
| 1979 | 5,434.5         | .789  | 4,487.8          | .790  | 947.3               | .783  |
| 1980 | 5,439.3         | .869  | 4,560.3          | .872  | 878.7               | .854  |
| 1981 | 5,468.9         | .938  | 4,575.7          | .937  | 892.9               | .941  |
| 1982 | 5,354.4         | 1.000 | 4,568.6          | 1.000 | 785.8               | 1.000 |
| 1983 | 5,395.4         | 1.057 | 4,543.7          | 1.066 | 853.4               | 1.006 |
| 1984 | 5,501.4         | 1.118 | 4,510.4          | 1.136 | 1,002.9             | 1.027 |

contrast, investment in human capital has grown much more slowly than investment in nonhuman capital. Investment in human capital reached a peak in 1971 that was not surpassed until 1977. The level of investment in human capital in 1984 was below the peak for the period as a whole, which was reached in 1981.

Our final step in allocating the value of total product of the private sector of the U.S. economy between consumption and investment for

the period 1948–84 is to estimate the value of consumption for all years. The value of full consumption is equal to the value of consumption of market goods and services plus the value of nonmarket consumption in the form of time spent in household production and leisure. Our estimates of consumption of market goods and services are based on those of Fraumeni and Jorgenson. We present estimates of full consumption, investment, and product in current prices in table 5.4 and

**Table 5.4 Full Gross Private Domestic Product (billions of current dollars)**

| Year | Full Product | Full Consumption | Full Investment | Consumption Share | Investment Share |
|------|--------------|------------------|-----------------|-------------------|------------------|
| 1948 | 988.4        | 517.4            | 471.0           | .523              | .477             |
| 1949 | 1,037.7      | 549.3            | 488.4           | .529              | .471             |
| 1950 | 1,113.3      | 576.8            | 536.5           | .518              | .482             |
| 1951 | 1,203.0      | 615.2            | 587.8           | .511              | .489             |
| 1952 | 1,262.8      | 642.9            | 619.9           | .509              | .491             |
| 1953 | 1,379.3      | 699.4            | 679.9           | .507              | .493             |
| 1954 | 1,462.0      | 741.3            | 720.7           | .507              | .493             |
| 1955 | 1,531.8      | 763.6            | 768.1           | .499              | .501             |
| 1956 | 1,617.5      | 800.8            | 816.7           | .495              | .505             |
| 1957 | 1,759.1      | 862.7            | 896.4           | .490              | .510             |
| 1958 | 1,877.6      | 926.2            | 951.4           | .493              | .507             |
| 1959 | 1,951.5      | 954.2            | 997.4           | .489              | .511             |
| 1960 | 2,027.8      | 993.3            | 1,034.5         | .490              | .510             |
| 1961 | 2,162.8      | 1,059.9          | 1,102.9         | .490              | .510             |
| 1962 | 2,273.7      | 1,109.9          | 1,163.8         | .488              | .512             |
| 1963 | 2,360.4      | 1,150.8          | 1,209.6         | .488              | .512             |
| 1964 | 2,587.4      | 1,256.2          | 1,331.1         | .486              | .514             |
| 1965 | 2,765.8      | 1,358.9          | 1,406.9         | .491              | .509             |
| 1966 | 2,980.1      | 1,475.5          | 1,504.6         | .495              | .505             |
| 1967 | 3,168.4      | 1,572.4          | 1,596.1         | .496              | .504             |
| 1968 | 3,401.3      | 1,672.8          | 1,728.5         | .492              | .508             |
| 1969 | 3,651.7      | 1,787.7          | 1,864.0         | .490              | .510             |
| 1970 | 4,056.9      | 1,982.8          | 2,074.1         | .489              | .511             |
| 1971 | 4,538.8      | 2,202.9          | 2,335.9         | .485              | .515             |
| 1972 | 4,785.5      | 2,371.8          | 2,413.7         | .496              | .504             |
| 1973 | 5,184.1      | 2,615.1          | 2,568.9         | .504              | .496             |
| 1974 | 5,670.2      | 2,861.2          | 2,809.0         | .505              | .495             |
| 1975 | 6,335.6      | 3,191.9          | 3,143.7         | .504              | .496             |
| 1976 | 6,790.7      | 3,474.7          | 3,316.0         | .512              | .488             |
| 1977 | 7,382.5      | 3,755.7          | 3,626.9         | .509              | .491             |
| 1978 | 7,911.4      | 4,117.3          | 3,794.1         | .520              | .480             |
| 1979 | 8,918.2      | 4,631.0          | 4,287.2         | .519              | .481             |
| 1980 | 9,731.1      | 5,006.2          | 4,724.9         | .514              | .486             |
| 1981 | 10,620.7     | 5,491.4          | 5,129.4         | .517              | .483             |
| 1982 | 11,435.0     | 6,080.6          | 5,354.4         | .532              | .468             |
| 1983 | 12,272.2     | 6,570.7          | 5,701.5         | .535              | .465             |
| 1984 | 13,254.7     | 7,101.5          | 6,153.2         | .536              | .464             |

in constant prices in table 5.5. The share of consumption in total product is almost the same as the share of investment, falling from 0.523 in 1948 to a low of 0.485 in 1971 and rising to a peak of 0.536 in 1984 at the end of the period. The price of investment has risen more rapidly than the price of consumption. By contrast, investment has grown more slowly than consumption.

**Table 5.5 Full Gross Private Domestic Product (billions of constant dollars)**

| Year | Full Product |       | Full Consumption |       | Full Investment |       |
|------|--------------|-------|------------------|-------|-----------------|-------|
|      | Quantity     | Price | Quantity         | Price | Quantity        | Price |
| 1949 | 5,597.2      | .185  | 2,696.7          | .204  | 2,899.1         | .168  |
| 1950 | 5,755.8      | .193  | 2,736.6          | .211  | 3,025.0         | .177  |
| 1951 | 5,944.0      | .202  | 2,809.1          | .219  | 3,144.1         | .187  |
| 1952 | 6,062.9      | .208  | 2,865.2          | .224  | 3,207.0         | .193  |
| 1953 | 6,234.7      | .221  | 2,950.5          | .237  | 3,293.1         | .206  |
| 1954 | 6,321.0      | .231  | 2,982.3          | .249  | 3,349.0         | .215  |
| 1955 | 6,524.7      | .235  | 3,051.4          | .250  | 3,487.9         | .220  |
| 1956 | 6,648.6      | .243  | 3,110.6          | .257  | 3,552.8         | .230  |
| 1957 | 6,830.7      | .258  | 3,188.7          | .271  | 3,658.0         | .245  |
| 1958 | 6,943.8      | .270  | 3,252.6          | .285  | 3,706.2         | .257  |
| 1959 | 7,105.9      | .275  | 3,317.3          | .288  | 3,805.1         | .262  |
| 1960 | 7,240.1      | .280  | 3,383.7          | .294  | 3,872.9         | .267  |
| 1961 | 7,464.4      | .290  | 3,490.1          | .304  | 3,991.1         | .276  |
| 1962 | 7,643.6      | .297  | 3,570.3          | .311  | 4,091.0         | .284  |
| 1963 | 7,858.7      | .300  | 3,667.9          | .314  | 4,209.2         | .287  |
| 1964 | 8,101.9      | .319  | 3,782.4          | .332  | 4,338.5         | .307  |
| 1965 | 8,280.5      | .334  | 3,895.2          | .349  | 4,402.0         | .320  |
| 1966 | 8,444.5      | .353  | 4,014.5          | .368  | 4,443.3         | .339  |
| 1967 | 8,620.3      | .368  | 4,123.3          | .381  | 4,508.5         | .354  |
| 1968 | 8,833.0      | .385  | 4,219.7          | .396  | 4,625.5         | .374  |
| 1969 | 9,060.5      | .403  | 4,306.9          | .415  | 4,767.4         | .391  |
| 1970 | 9,286.4      | .437  | 4,424.0          | .448  | 4,876.0         | .425  |
| 1971 | 9,561.0      | .475  | 4,554.2          | .484  | 5,020.9         | .465  |
| 1972 | 9,700.9      | .493  | 4,701.3          | .504  | 5,010.3         | .482  |
| 1973 | 9,848.5      | .526  | 4,791.9          | .546  | 5,066.4         | .507  |
| 1974 | 9,929.0      | .571  | 4,890.0          | .585  | 5,045.1         | .557  |
| 1975 | 10,129.2     | .625  | 5,085.7          | .628  | 5,046.8         | .623  |
| 1976 | 10,345.4     | .656  | 5,223.9          | .665  | 5,124.4         | .647  |
| 1977 | 10,643.1     | .694  | 5,360.3          | .701  | 5,286.1         | .686  |
| 1978 | 10,872.9     | .728  | 5,490.7          | .750  | 5,385.0         | .705  |
| 1979 | 11,027.5     | .805  | 5,638.3          | .821  | 5,434.5         | .789  |
| 1980 | 11,223.5     | .867  | 5,783.3          | .866  | 5,439.3         | .869  |
| 1981 | 11,375.0     | .934  | 5,905.6          | .930  | 5,468.9         | .938  |
| 1982 | 11,435.0     | 1.000 | 6,080.6          | 1.000 | 5,354.4         | 1.000 |
| 1983 | 11,584.5     | 1.059 | 6,189.0          | 1.062 | 5,395.4         | 1.057 |
| 1984 | 11,811.5     | 1.122 | 6,310.0          | 1.125 | 5,501.4         | 1.118 |

We next analyze changes in the structure of full gross private domestic product for the U.S. economy over the period 1948–84. We present growth rates of full product, investment, and consumption for the period as a whole and for eight subperiods in table 5.6. We give growth rates for each measure of output in current and constant prices and a growth rate for the corresponding price index. We also provide growth rates for each output measure in per capita terms.

The growth rate of full investment was at its maximum during the period 1948–53 at 3.19 percent per year. The growth rate of investment per capita was only 0.54 percent per year for the period as a whole and was negative for the last of the eight subperiods. By contrast, the growth rate of full consumption per capita was positive for all eight subperiods with a rising trend, reaching a maximum in the period 1973–79 at 1.87 percent. The growth rate of full product showed little trend through 1960–66 after an initial burst of growth in full product at 2.70 percent per year in 1948–53. Since 1966, the growth rate of full product has gradually declined, exhibiting the much-discussed slowdown in U.S. economic growth.

Our next objective is to allocate the value of total factor outlay for the private domestic sector of the U.S. economy between labor and property services for the period 1948–84. We first estimate the value of outlay on the services of human capital for all years. The value of outlay on the services of human capital is the sum of outlay on market and nonmarket labor activities. Our estimates of market labor outlays are based on those of Fraumeni and Jorgenson. We present estimates of market labor outlay, nonmarket labor outlay, and full labor outlay in current prices in table 5.7 and in constant prices in table 5.8. The share of nonmarket labor outlay has been by far the largest part of labor outlay, varying relatively little from 0.835 at the beginning of the postwar period. The prices of market and nonmarket labor outlay move in parallel throughout the period, as do the corresponding quantities.

We combine our estimates of the services of human capital with estimates of the services of nonhuman capital, which are based on those of Fraumeni and Jorgenson. We present the value of full factor outlay, property outlay, and labor outlay in current prices in table 5.9 and in constant prices in table 5.10. Labor has had a predominant share in full factor outlay, averaging around 90 percent throughout the period. The share of property has averaged close to 10 percent, rising slightly from 0.112 at the beginning of the period to 0.119 at the end of the period. The price of labor outlay has risen relative to the price of property outlay, while capital services have risen relative to labor services. Capital services have grown more rapidly than output throughout the period.



**Table 5.6 Full Gross Private Domestic Product, Rates of Growth, 1949–84**

|                            | 1949–84 | 1949–53 | 1953–57 | 1957–60 | 1960–66 | 1966–69 | 1969–73 | 1973–79 | 1979–84 |
|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Full product:</b>       |         |         |         |         |         |         |         |         |         |
| Current prices             | 7.28    | 7.11    | 6.08    | 4.74    | 6.42    | 6.77    | 8.76    | 9.04    | 7.93    |
| Constant prices            | 2.13    | 2.70    | 2.28    | 1.94    | 2.56    | 2.35    | 2.08    | 1.95    | 1.29    |
| Constant prices per capita | .84     | 1.04    | .51     | .13     | 1.11    | 1.25    | 1.12    | 1.11    | .24     |
| Price index                | 5.15    | 4.45    | 3.87    | 2.73    | 3.86    | 4.42    | 6.66    | 7.09    | 6.64    |
| <b>Full investment:</b>    |         |         |         |         |         |         |         |         |         |
| Current prices             | 7.24    | 8.27    | 6.91    | 4.78    | 6.24    | 7.14    | 8.02    | 8.54    | 7.23    |
| Constant prices            | 1.83    | 3.19    | 2.63    | 1.90    | 2.29    | 2.35    | 1.52    | 1.17    | .24     |
| Constant prices per capita | .54     | 1.52    | .86     | .10     | .84     | 1.25    | .55     | .33     | -.80    |
| Price index                | 5.42    | 5.10    | 4.33    | 2.87    | 3.98    | 4.76    | 6.50    | 7.37    | 6.97    |
| <b>Full consumption:</b>   |         |         |         |         |         |         |         |         |         |
| Current prices             | 7.31    | 6.04    | 5.25    | 4.70    | 6.60    | 6.40    | 9.51    | 9.52    | 8.55    |
| Constant prices            | 2.43    | 2.25    | 1.94    | 1.98    | 2.85    | 2.34    | 2.67    | 2.71    | 2.25    |
| Constant prices per capita | 1.13    | .59     | .17     | .17     | 1.40    | 1.25    | 1.70    | 1.87    | 1.20    |
| Price index                | 4.88    | 3.75    | 3.35    | 2.72    | 3.74    | 4.01    | 6.86    | 6.80    | 6.30    |

**Table 5.7 Full Labor Outlay (billions of current dollars)**

| Year | Full Labor Outlay | Market Labor Outlay | Nonmarket Labor Outlay | Market Share | Nonmarket Share |
|------|-------------------|---------------------|------------------------|--------------|-----------------|
| 1948 | 877.6             | 144.8               | 732.8                  | .165         | .835            |
| 1949 | 929.5             | 144.1               | 785.3                  | .155         | .845            |
| 1950 | 988.6             | 156.9               | 831.7                  | .159         | .841            |
| 1951 | 1,062.7           | 180.5               | 882.2                  | .170         | .830            |
| 1952 | 1,123.4           | 194.1               | 929.3                  | .173         | .827            |
| 1953 | 1,235.2           | 208.9               | 1,026.3                | .169         | .831            |
| 1954 | 1,316.8           | 209.9               | 1,106.9                | .159         | .841            |
| 1955 | 1,360.7           | 219.2               | 1,141.5                | .161         | .839            |
| 1956 | 1,445.7           | 234.7               | 1,211.0                | .162         | .838            |
| 1957 | 1,585.2           | 250.6               | 1,334.6                | .158         | .842            |
| 1958 | 1,710.0           | 257.2               | 1,452.8                | .150         | .850            |
| 1959 | 1,756.6           | 270.1               | 1,486.5                | .154         | .846            |
| 1960 | 1,832.8           | 282.7               | 1,550.1                | .154         | .846            |
| 1961 | 1,961.8           | 292.4               | 1,669.3                | .149         | .851            |
| 1962 | 2,052.4           | 309.8               | 1,742.6                | .151         | .849            |
| 1963 | 2,118.4           | 320.5               | 1,797.9                | .151         | .849            |
| 1964 | 2,321.5           | 339.5               | 1,982.0                | .146         | .854            |
| 1965 | 2,465.1           | 363.0               | 2,102.1                | .147         | .853            |
| 1966 | 2,655.7           | 401.7               | 2,254.1                | .151         | .849            |
| 1967 | 2,838.7           | 427.3               | 2,411.4                | .151         | .849            |
| 1968 | 3,056.5           | 470.7               | 2,585.8                | .154         | .846            |
| 1969 | 3,296.7           | 519.1               | 2,777.6                | .157         | .843            |
| 1970 | 3,698.9           | 556.2               | 3,142.6                | .150         | .850            |
| 1971 | 4,145.7           | 594.2               | 3,551.5                | .143         | .857            |
| 1972 | 4,342.8           | 652.7               | 3,690.2                | .150         | .850            |
| 1973 | 4,706.6           | 745.2               | 3,961.4                | .158         | .842            |
| 1974 | 5,181.2           | 816.1               | 4,365.1                | .158         | .842            |
| 1975 | 5,763.2           | 858.8               | 4,904.4                | .149         | .851            |
| 1976 | 6,139.3           | 957.3               | 5,181.9                | .156         | .844            |
| 1977 | 6,630.6           | 1,063.0             | 5,567.6                | .160         | .840            |
| 1978 | 7,068.3           | 1,214.7             | 5,853.5                | .172         | .828            |
| 1979 | 8,010.9           | 1,375.3             | 6,635.6                | .172         | .828            |
| 1980 | 8,758.3           | 1,493.9             | 7,264.4                | .171         | .829            |
| 1981 | 9,485.9           | 1,635.5             | 7,850.4                | .172         | .828            |
| 1982 | 10,205.1          | 1,692.0             | 8,513.1                | .166         | .834            |
| 1983 | 10,908.4          | 1,790.5             | 9,117.8                | .164         | .836            |
| 1984 | 11,682.8          | 1,968.6             | 9,714.1                | .169         | .831            |

To analyze changes in the structure of gross private domestic factor outlay, we present growth rates of full factor output, labor outlay, and property outlay for the period 1948–84 and for eight subperiods in table 5.11. The growth rate of labor input or full labor outlay at constant prices was only slightly greater than the growth of population. The per capita

Table 5.8 Full Labor Outlay (billions of constant dollars)

| Year | Full Labor Outlay |       | Market Labor Outlay |       | Nonmarket Outlay |       |
|------|-------------------|-------|---------------------|-------|------------------|-------|
|      | Quantity          | Price | Quantity            | Price | Quantity         | Price |
| 1949 | 5,739.7           | .162  | 1,000.7             | .144  | 4,743.8          | .166  |
| 1950 | 5,808.1           | .170  | 1,031.5             | .152  | 4,783.8          | .174  |
| 1951 | 5,939.0           | .179  | 1,087.3             | .166  | 4,862.6          | .181  |
| 1952 | 6,042.6           | .186  | 1,108.3             | .175  | 4,945.5          | .188  |
| 1953 | 6,150.2           | .201  | 1,100.2             | .190  | 5,059.5          | .203  |
| 1954 | 6,253.9           | .211  | 1,084.5             | .194  | 5,176.4          | .214  |
| 1955 | 6,381.8           | .213  | 1,119.4             | .196  | 5,270.7          | .217  |
| 1956 | 6,509.0           | .222  | 1,144.2             | .205  | 5,373.5          | .225  |
| 1957 | 6,675.1           | .237  | 1,141.7             | .220  | 5,539.6          | .241  |
| 1958 | 6,786.4           | .252  | 1,099.9             | .234  | 5,687.5          | .255  |
| 1959 | 6,885.2           | .255  | 1,140.0             | .237  | 5,748.2          | .259  |
| 1960 | 7,031.9           | .261  | 1,166.2             | .242  | 5,868.9          | .264  |
| 1961 | 7,208.8           | .272  | 1,150.6             | .254  | 6,057.9          | .276  |
| 1962 | 7,329.5           | .280  | 1,183.3             | .262  | 6,147.0          | .283  |
| 1963 | 7,476.7           | .283  | 1,191.6             | .269  | 6,284.7          | .286  |
| 1964 | 7,620.4           | .305  | 1,196.7             | .284  | 6,422.2          | .309  |
| 1965 | 7,708.4           | .320  | 1,238.4             | .293  | 6,470.9          | .325  |
| 1966 | 7,779.6           | .341  | 1,275.3             | .315  | 6,507.6          | .346  |
| 1967 | 7,919.3           | .358  | 1,286.4             | .332  | 6,635.2          | .363  |
| 1968 | 8,101.1           | .377  | 1,322.2             | .356  | 6,781.7          | .381  |
| 1969 | 8,331.4           | .396  | 1,371.5             | .379  | 6,963.6          | .399  |
| 1970 | 8,535.9           | .433  | 1,353.8             | .411  | 7,183.0          | .438  |
| 1971 | 8,728.4           | .475  | 1,328.5             | .447  | 7,397.1          | .480  |
| 1972 | 8,784.8           | .494  | 1,384.1             | .472  | 7,400.8          | .499  |
| 1973 | 8,867.1           | .531  | 1,443.4             | .516  | 7,425.8          | .533  |
| 1974 | 8,990.3           | .576  | 1,458.5             | .560  | 7,533.8          | .579  |
| 1975 | 9,132.7           | .631  | 1,405.9             | .611  | 7,726.1          | .635  |
| 1976 | 9,269.8           | .662  | 1,461.2             | .655  | 7,808.8          | .664  |
| 1977 | 9,493.2           | .698  | 1,527.9             | .696  | 7,965.7          | .699  |
| 1978 | 9,674.1           | .731  | 1,632.3             | .744  | 8,041.5          | .728  |
| 1979 | 9,851.9           | .813  | 1,672.3             | .822  | 8,179.2          | .811  |
| 1980 | 10,037.7          | .873  | 1,692.9             | .882  | 8,344.5          | .871  |
| 1981 | 10,150.4          | .935  | 1,718.3             | .952  | 8,431.7          | .931  |
| 1982 | 10,205.1          | 1.000 | 1,692.0             | 1.000 | 8,513.1          | 1.000 |
| 1983 | 10,254.0          | 1.064 | 1,710.4             | 1.047 | 8,543.6          | 1.067 |
| 1984 | 10,324.7          | 1.132 | 1,794.2             | 1.097 | 8,532.6          | 1.138 |

growth rate of labor input was only 0.38 per year for the period as a whole. This growth rate was negative or zero for two of the eight subperiods.

The growth rate of capital input or full property outlay at constant prices exceeded the growth of population by a considerable margin. The per capita growth rate of capital input was 2.02 percent per year. This growth rate was positive throughout the period. The growth rate of total input, full factor outlay in constant prices, is a weighted average

**Table 5.9 Full Gross Private Domestic Factor Outlay (billions of current dollars)**

| Year | Full Factor Outlay | Full Property Outlay | Full Labor Outlay | Property Share | Labor Share |
|------|--------------------|----------------------|-------------------|----------------|-------------|
| 1948 | 988.4              | 110.8                | 877.6             | .112           | .888        |
| 1949 | 1,037.7            | 108.3                | 929.5             | .104           | .896        |
| 1950 | 1,113.3            | 124.7                | 988.6             | .112           | .888        |
| 1951 | 1,203.0            | 140.3                | 1,062.7           | .117           | .883        |
| 1952 | 1,262.8            | 139.4                | 1,123.4           | .110           | .890        |
| 1953 | 1,379.3            | 144.1                | 1,235.2           | .104           | .896        |
| 1954 | 1,462.0            | 145.2                | 1,316.8           | .099           | .901        |
| 1955 | 1,531.8            | 171.1                | 1,360.7           | .112           | .888        |
| 1956 | 1,617.5            | 171.8                | 1,445.7           | .106           | .894        |
| 1957 | 1,759.1            | 173.9                | 1,585.2           | .099           | .901        |
| 1958 | 1,877.6            | 167.6                | 1,710.0           | .089           | .911        |
| 1959 | 1,951.5            | 195.0                | 1,756.6           | .100           | .900        |
| 1960 | 2,027.8            | 195.0                | 1,832.8           | .096           | .904        |
| 1961 | 2,162.8            | 201.0                | 1,961.8           | .093           | .907        |
| 1962 | 2,273.7            | 221.3                | 2,052.4           | .097           | .903        |
| 1963 | 2,360.4            | 242.0                | 2,118.4           | .103           | .897        |
| 1964 | 2,587.4            | 265.9                | 2,321.5           | .103           | .897        |
| 1965 | 2,765.8            | 300.7                | 2,465.1           | .109           | .891        |
| 1966 | 2,980.1            | 324.4                | 2,655.7           | .109           | .891        |
| 1967 | 3,168.4            | 329.8                | 2,838.7           | .104           | .896        |
| 1968 | 3,401.3            | 344.8                | 3,056.5           | .101           | .899        |
| 1969 | 3,651.7            | 354.9                | 3,296.7           | .097           | .903        |
| 1970 | 4,056.9            | 358.0                | 3,698.9           | .088           | .912        |
| 1971 | 4,538.8            | 393.1                | 4,145.7           | .087           | .913        |
| 1972 | 4,785.5            | 442.7                | 4,342.8           | .092           | .908        |
| 1973 | 5,184.1            | 477.5                | 4,706.6           | .092           | .908        |
| 1974 | 5,670.2            | 489.0                | 5,181.2           | .086           | .914        |
| 1975 | 6,335.6            | 572.3                | 5,763.2           | .090           | .910        |
| 1976 | 6,790.7            | 651.4                | 6,139.3           | .096           | .904        |
| 1977 | 7,382.5            | 752.0                | 6,630.6           | .102           | .898        |
| 1978 | 7,911.4            | 843.2                | 7,068.3           | .107           | .893        |
| 1979 | 8,918.2            | 907.3                | 8,010.9           | .102           | .898        |
| 1980 | 9,731.1            | 972.7                | 8,758.3           | .100           | .900        |
| 1981 | 10,620.7           | 1,134.9              | 9,485.9           | .107           | .893        |
| 1982 | 11,435.0           | 1,229.9              | 10,205.1          | .108           | .892        |
| 1983 | 12,272.2           | 1,363.8              | 10,908.4          | .111           | .889        |
| 1984 | 13,254.7           | 1,571.9              | 11,682.8          | .119           | .881        |

of growth rates of labor and capital inputs and averaged 0.55 per year in per capita terms for the period as a whole.

Comparing the growth rates of input and output, we find that output grew at 2.13 percent per year for the period as a whole and that input grew at 1.84 percent. Input growth has accounted for 86 percent of output growth. This proportion has increased in recent subperiods. For

Table 5.10 Full Gross Domestic Factor Outlay (billions of constant dollars)

| Year | Full Factor Outlay |       | Property Outlay |       | Labor Outlay |       |
|------|--------------------|-------|-----------------|-------|--------------|-------|
|      | Quantity           | Price | Quantity        | Price | Quantity     | Price |
| 1949 | 6,081.7            | .171  | 399.0           | .271  | 5,739.7      | .162  |
| 1950 | 6,170.2            | .180  | 413.5           | .302  | 5,808.1      | .170  |
| 1951 | 6,334.3            | .190  | 437.8           | .320  | 5,939.0      | .179  |
| 1952 | 6,464.5            | .195  | 457.5           | .305  | 6,042.6      | .186  |
| 1953 | 6,586.8            | .209  | 470.4           | .306  | 6,150.2      | .201  |
| 1954 | 6,706.3            | .218  | 484.4           | .300  | 6,253.9      | .211  |
| 1955 | 6,847.2            | .224  | 496.8           | .344  | 6,381.8      | .213  |
| 1956 | 7,001.9            | .231  | 519.0           | .331  | 6,509.0      | .222  |
| 1957 | 7,188.8            | .245  | 538.2           | .323  | 6,675.1      | .237  |
| 1958 | 7,317.7            | .257  | 554.4           | .302  | 6,786.4      | .252  |
| 1959 | 7,423.3            | .263  | 561.7           | .347  | 6,885.2      | .255  |
| 1960 | 7,587.1            | .267  | 578.1           | .337  | 7,031.9      | .261  |
| 1961 | 7,777.2            | .278  | 591.9           | .340  | 7,208.8      | .272  |
| 1962 | 7,910.1            | .287  | 604.0           | .366  | 7,329.5      | .280  |
| 1963 | 8,075.3            | .292  | 621.1           | .390  | 7,476.7      | .283  |
| 1964 | 8,241.1            | .314  | 640.9           | .415  | 7,620.4      | .305  |
| 1965 | 8,357.3            | .331  | 664.0           | .453  | 7,708.4      | .320  |
| 1966 | 8,466.7            | .352  | 694.0           | .467  | 7,779.6      | .341  |
| 1967 | 8,645.3            | .366  | 727.2           | .453  | 7,919.3      | .358  |
| 1968 | 8,857.9            | .384  | 755.5           | .456  | 8,101.1      | .377  |
| 1969 | 9,120.3            | .400  | 786.1           | .452  | 8,331.4      | .396  |
| 1970 | 9,359.4            | .433  | 819.7           | .437  | 8,535.9      | .433  |
| 1971 | 9,577.8            | .474  | 845.7           | .465  | 8,728.4      | .475  |
| 1972 | 9,664.5            | .495  | 875.9           | .505  | 8,784.8      | .494  |
| 1973 | 9,785.1            | .530  | 914.0           | .522  | 8,867.1      | .531  |
| 1974 | 9,953.7            | .570  | 961.4           | .509  | 8,990.3      | .576  |
| 1975 | 10,130.2           | .625  | 997.6           | .574  | 9,132.7      | .631  |
| 1976 | 10,288.3           | .660  | 1,018.8         | .639  | 9,269.8      | .662  |
| 1977 | 10,543.0           | .700  | 1,050.2         | .716  | 9,493.2      | .698  |
| 1978 | 10,764.6           | .735  | 1,090.2         | .773  | 9,674.1      | .731  |
| 1979 | 10,988.1           | .812  | 1,135.5         | .799  | 9,851.9      | .813  |
| 1980 | 11,214.6           | .868  | 1,176.8         | .827  | 10,037.7     | .873  |
| 1981 | 11,353.6           | .935  | 1,203.2         | .943  | 10,150.4     | .935  |
| 1982 | 11,435.0           | 1.000 | 1,229.9         | 1.000 | 10,205.1     | 1.000 |
| 1983 | 11,502.6           | 1.067 | 1,248.5         | 1.092 | 10,254.0     | 1.064 |
| 1984 | 11,597.4           | 1.143 | 1,271.7         | 1.236 | 10,324.7     | 1.132 |

example, input growth was 99 percent of output growth in the period 1973–79 and 84 percent in 1979–84.

#### 5.4 Income and Expenditure

In this section, we integrate the estimates of income and expenditure associated with market activities by Fraumeni and Jorgenson (1980) with our estimates of income and expenditure for nonmarket activities.

**Table 5.11 Gross Private National Labor and Property Income, Rates of Growth, 1949–84**

|                              | 1949–84 | 1949–53 | 1953–57 | 1957–60 | 1960–66 | 1966–69 | 1969–73 | 1973–79 | 1979–84 |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Full factor outlay:          |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.28    | 7.11    | 6.08    | 4.74    | 6.42    | 6.77    | 8.76    | 9.04    | 7.93    |
| Constant prices              | 1.84    | 1.99    | 2.19    | 1.80    | 1.83    | 2.48    | 1.76    | 1.93    | 1.08    |
| Constant prices <sup>a</sup> | .55     | .33     | .41     | –.01    | .38     | 1.38    | .79     | 1.09    | .03     |
| Price index                  | 5.43    | 5.02    | 3.97    | 2.87    | 4.61    | 4.26    | 7.04    | 7.11    | 6.84    |
| Full labor outlay:           |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.23    | 7.11    | 6.24    | 4.84    | 6.18    | 7.21    | 8.90    | 8.86    | 7.55    |
| Constant prices              | 1.68    | 1.73    | 2.05    | 1.74    | 1.68    | 2.28    | 1.56    | 1.76    | .94     |
| Constant prices <sup>a</sup> | .38     | .07     | .28     | –.07    | .23     | 1.19    | .59     | .91     | –.11    |
| Price index                  | 5.55    | 5.39    | 4.12    | 3.22    | 4.46    | 4.98    | 7.33    | 7.10    | 6.62    |
| Full property outlay:        | 7.64    | 7.14    | 4.70    | 3.82    | 8.48    | 3.00    | 7.42    | 10.70   | 10.99   |
| Current prices               |         |         |         |         |         |         |         |         |         |
| Constant prices              | 3.31    | 4.12    | 3.37    | 2.38    | 3.05    | 4.15    | 3.77    | 3.62    | 2.27    |
| Constant prices <sup>a</sup> | 2.02    | 2.45    | 1.59    | .58     | 1.59    | 3.06    | 2.80    | 2.77    | 1.22    |
| Price index                  | 4.34    | 3.04    | 1.35    | 1.41    | 5.44    | –1.09   | 3.60    | 7.09    | 8.73    |

<sup>a</sup>This data calculated on a per capita basis.

Following Fraumeni and Jorgenson, we present accounts for the private national sector of the U.S. economy. The income of the private national sector includes compensation for the services of human and nonhuman capital in the private domestic sector, the government sector, and the rest of the world. Income from the services of human capital for the private national sector includes all incomes generated from human capital for individuals in the U.S. population.

The value of income is equal to the value of expenditure for the income and expenditure account. Expenditure in the U.S. economy includes the consumption of market and nonmarket goods and services and saving in the form of human and nonhuman capital. We add to the consumption of market goods and services, as defined by Fraumeni and Jorgenson, our estimates of the value of consumption of nonmarket goods and services. Similarly, we add to estimates of saving in the form of nonhuman capital by Fraumeni and Jorgenson our estimates of saving in the form of human capital.

We present the income side of the income and expenditure account in current prices for the private national sector of the U.S. economy for the year 1982 in table 5.12. We have estimated labor compensation after taxes for individual workers cross-classified by sex, single year of education, and single year of age. Labor compensation after taxes is the sum of labor compensation for all groups of individual workers. For market labor compensation, we estimate personal income taxes attributed to labor income by the methods of Jorgenson and Yun (1986). Income tax not allocated to labor income is allocated to property income to obtain property compensation after taxes. Following Fraumeni and Jorgenson, we treat social insurance funds as part of the private sector of the U.S. national economy. Contributions to social insurance are included and transfers from social insurance funds excluded from labor income. Property income includes the investment income of social insurance funds, less transfers to general government by these funds.

Our next objective is to allocate the value of income for the private national sector of the U.S. economy between labor and property income for the period 1948–84. We first estimate the value of compensation for market and nonmarket labor activities for all years. The value of labor compensation for nonmarket activities is equal to the value of time spent in household production and leisure and the value of time spent on investment in human capital. Our estimates of market labor compensation after taxes are based on those of Fraumeni and Jorgenson. We present estimates of market labor income, nonmarket labor income, and full labor income in current prices in table 5.13 and in constant prices in table 5.14.

The share of nonmarket labor income is far larger than that of market labor income, varying from 0.817 to 0.842 as a proportion of full labor

**Table 5.12** Gross Private National Labor and Property Income, 1982 (billions of current dollars)

| Labor Income    |   |                |
|-----------------|---|----------------|
| 1.              | Private domestic outlay for labor services (table 6.4, line 3, plus our imputation for proprietors)                   | 1,692.0        |
| 2.              | + Income originating in general government (table 1.7, line 12)   | 343.9          |
| 3.              | + Compensation of employees in government enterprises (table 6.4, lines 81, 86)                                       | 39.6           |
| 4.              | + Compensation of employees, rest of world (table 6.4, line 87)   | - .1           |
| 5.              | - Personal income taxes attributed to labor income (our imputation)   | <u>263.1</u>   |
| 6.              | = Private national labor income   | 1,812.3        |
| 7.              | + Nonmarket labor income  | <u>8,513.1</u> |
| 8.              | = Full private national labor income  | 10,325.4       |
| Property Income |   |                |
| 1.              | Gross private domestic outlay for capital services (our imputation)   | 1,229.9        |
| 2.              | + Corporate profits and net interest, rest of world (table 6.1, line 82)  | 51.2           |
| 3.              | + Investment income of social insurance funds less transfers to general government (table 3.13, lines 7, 9, 18, 20)   | 33.0           |
| 4.              | + Net interest paid by government (table 1.9, line 16 plus line 12, minus table 3.1, line 18, and table 2.1, line 28) | 39.0           |
| 5.              | - Corporate profits tax liability (tables 3.2, line 6, and 3.3, line 6)   | 63.0           |
| 6.              | - Business property taxes (table 3.5, lines 24, 25, 26, 27)   | 102.2          |
| 7.              | - Personal income taxes attributed to property income (our imputation)  | 85.4           |
| 8.              | - Federal estate and gift taxes (table 3.2, line 4)   | 7.6            |
| 9.              | - State and local estate and gift taxes (table 3.4, line 11)  | 2.6            |
| 10.             | - State and local personal motor vehicle licenses, property taxes, and other taxes (table 3.4, lines 12, 13, 14)      | <u>7.3</u>     |
| 11.             | = Gross private national property income  | 1,085.1        |

*Note:* All table references are to the NIPA tables in the March 1986 *Survey of Current Business*.

income during the period 1948–84. The share of market labor income is nearly constant over the period. The prices of market and nonmarket components of labor income have risen in proportion with a slightly greater increase in the price of nonmarket income since around 1958.

Our final step in allocating the value of income for the private national sector of the U.S. economy between labor and property income for the period 1948–84 is to estimate the value of property compensation for all years. Our estimates of property compensation are based on those of Fraumeni and Jorgenson. We present estimates of full labor income, property income, and income in current prices in table 5.15 and in constant prices in table 5.16. The property share of national income has risen from a minimum of 0.066 in 1974 to a maximum for the period as a whole of 0.107 in 1984.

The price of property income rose less rapidly than the price of labor income until around 1960. The price of property income then fell during



**Table 5.13 Full Labor Income (billions of current dollars)**

| Year | Full Labor Income | Market Labor Income | Nonmarket Labor Income | Market Share | Nonmarket Share |
|------|-------------------|---------------------|------------------------|--------------|-----------------|
| 1948 | 884.2             | 151.4               | 732.8                  | .171         | .829            |
| 1949 | 940.5             | 155.2               | 785.3                  | .165         | .835            |
| 1950 | 1,000.5           | 168.9               | 831.7                  | .169         | .831            |
| 1951 | 1,073.8           | 191.7               | 882.2                  | .178         | .822            |
| 1952 | 1,134.6           | 205.4               | 929.3                  | .181         | .819            |
| 1953 | 1,246.3           | 220.0               | 1,026.3                | .177         | .823            |
| 1954 | 1,331.6           | 224.7               | 1,106.9                | .169         | .831            |
| 1955 | 1,375.4           | 233.9               | 1,141.5                | .170         | .830            |
| 1956 | 1,460.2           | 249.2               | 1,211.0                | .171         | .829            |
| 1957 | 1,600.7           | 266.2               | 1,334.6                | .166         | .834            |
| 1958 | 1,729.3           | 276.5               | 1,452.8                | .160         | .840            |
| 1959 | 1,775.6           | 289.1               | 1,486.5                | .163         | .837            |
| 1960 | 1,852.8           | 302.7               | 1,550.1                | .163         | .837            |
| 1961 | 1,984.6           | 315.3               | 1,669.3                | .159         | .841            |
| 1962 | 2,076.5           | 333.8               | 1,742.6                | .161         | .839            |
| 1963 | 2,144.6           | 346.7               | 1,797.9                | .162         | .838            |
| 1964 | 2,355.3           | 373.3               | 1,982.0                | .159         | .841            |
| 1965 | 2,500.2           | 398.1               | 2,102.1                | .159         | .841            |
| 1966 | 2,694.1           | 440.1               | 2,254.1                | .163         | .837            |
| 1967 | 2,881.9           | 470.5               | 2,411.4                | .163         | .837            |
| 1968 | 3,100.7           | 514.9               | 2,585.8                | .166         | .834            |
| 1969 | 3,339.0           | 561.4               | 2,777.6                | .168         | .832            |
| 1970 | 3,756.1           | 613.4               | 3,142.6                | .163         | .837            |
| 1971 | 4,216.1           | 664.5               | 3,551.5                | .158         | .842            |
| 1972 | 4,410.1           | 719.9               | 3,690.2                | .163         | .837            |
| 1973 | 4,781.5           | 820.1               | 3,961.4                | .172         | .828            |
| 1974 | 5,258.3           | 893.1               | 4,365.1                | .170         | .830            |
| 1975 | 5,864.1           | 959.7               | 4,904.4                | .164         | .836            |
| 1976 | 6,239.6           | 1,057.6             | 5,181.9                | .170         | .830            |
| 1977 | 6,730.2           | 1,162.6             | 5,567.6                | .173         | .827            |
| 1978 | 7,166.3           | 1,312.8             | 5,853.5                | .183         | .817            |
| 1979 | 8,102.0           | 1,466.5             | 6,635.6                | .181         | .819            |
| 1980 | 8,858.3           | 1,593.9             | 7,264.4                | .180         | .820            |
| 1981 | 9,583.9           | 1,733.5             | 7,850.4                | .181         | .819            |
| 1982 | 10,325.4          | 1,812.4             | 8,513.1                | .176         | .824            |
| 1983 | 11,055.7          | 1,937.9             | 9,117.8                | .175         | .825            |
| 1984 | 11,840.4          | 2,126.3             | 9,714.1                | .180         | .820            |

the period 1966–69 and resumed its rise during 1969–73. Since that time, the price of property income has been rising more rapidly with a substantial acceleration, relative to the price of labor income, after 1979. The stability of the share of property income through 1980 was the consequence of a steady increase in property income relative to labor income in constant prices. Property income in constant prices

**Table 5.14 Full Labor Income (billions of constant dollars)**

| Year | Full Labor Income |       | Market Labor Income |       | Nonmarket Labor Income |       |
|------|-------------------|-------|---------------------|-------|------------------------|-------|
|      | Quantity          | Price | Quantity            | Price | Quantity               | Price |
| 1949 | 5,692.5           | .165  | 948.0               | .164  | 4,743.8                | .166  |
| 1950 | 5,774.5           | .173  | 990.4               | .171  | 4,783.8                | .174  |
| 1951 | 5,900.3           | .182  | 1,037.5             | .185  | 4,862.6                | .181  |
| 1952 | 6,013.7           | .189  | 1,067.7             | .192  | 4,945.5                | .188  |
| 1953 | 6,146.3           | .203  | 1,086.4             | .202  | 5,059.5                | .203  |
| 1954 | 6,260.3           | .213  | 1,083.1             | .207  | 5,176.4                | .214  |
| 1955 | 6,369.1           | .216  | 1,097.5             | .213  | 5,270.7                | .217  |
| 1956 | 6,490.3           | .225  | 1,115.8             | .223  | 5,373.5                | .225  |
| 1957 | 6,660.5           | .240  | 1,119.6             | .238  | 5,539.6                | .241  |
| 1958 | 6,809.8           | .254  | 1,120.4             | .247  | 5,687.5                | .255  |
| 1959 | 6,894.3           | .258  | 1,144.4             | .253  | 5,748.2                | .259  |
| 1960 | 7,056.7           | .263  | 1,186.6             | .255  | 5,868.9                | .264  |
| 1961 | 7,244.0           | .274  | 1,183.7             | .266  | 6,057.9                | .276  |
| 1962 | 7,368.1           | .282  | 1,219.1             | .274  | 6,147.0                | .283  |
| 1963 | 7,522.8           | .285  | 1,235.8             | .281  | 6,284.7                | .286  |
| 1964 | 7,686.1           | .306  | 1,261.6             | .296  | 6,422.2                | .309  |
| 1965 | 7,768.0           | .322  | 1,295.7             | .307  | 6,470.9                | .325  |
| 1966 | 7,855.2           | .343  | 1,348.3             | .326  | 6,507.6                | .346  |
| 1967 | 8,010.2           | .360  | 1,375.8             | .342  | 6,635.2                | .363  |
| 1968 | 8,186.9           | .379  | 1,406.0             | .366  | 6,781.7                | .381  |
| 1969 | 8,402.5           | .397  | 1,439.7             | .390  | 6,963.6                | .399  |
| 1970 | 8,636.6           | .435  | 1,453.6             | .422  | 7,183.0                | .438  |
| 1971 | 8,858.5           | .476  | 1,460.1             | .455  | 7,397.1                | .480  |
| 1972 | 8,889.5           | .496  | 1,488.3             | .484  | 7,400.8                | .499  |
| 1973 | 8,966.5           | .533  | 1,540.9             | .532  | 7,425.8                | .533  |
| 1974 | 9,097.8           | .578  | 1,564.2             | .571  | 7,533.8                | .579  |
| 1975 | 9,313.6           | .630  | 1,587.3             | .605  | 7,726.1                | .635  |
| 1976 | 9,429.8           | .662  | 1,621.3             | .652  | 7,808.8                | .664  |
| 1977 | 9,624.0           | .699  | 1,658.6             | .701  | 7,965.7                | .699  |
| 1978 | 9,765.6           | .734  | 1,723.4             | .762  | 8,041.5                | .728  |
| 1979 | 9,903.9           | .818  | 1,725.1             | .850  | 8,179.2                | .811  |
| 1980 | 10,073.8          | .879  | 1,730.9             | .921  | 8,344.5                | .871  |
| 1981 | 10,213.6          | .938  | 1,782.2             | .973  | 8,431.7                | .931  |
| 1982 | 10,325.4          | 1.000 | 1,812.4             | 1.000 | 8,513.1                | 1.000 |
| 1983 | 10,401.6          | 1.063 | 1,858.3             | 1.043 | 8,543.6                | 1.067 |
| 1984 | 10,443.1          | 1.134 | 1,911.9             | 1.112 | 8,532.6                | 1.138 |

corresponds to the services of physical or nonhuman capital, while labor income corresponds to the services of human capital.

We next analyze the structure of full private national income over the postwar period. In table 5.17 we present growth rates of full income, labor income, and property income for the period 1949–84 and for eight subperiods. We give growth rates for each measure of income in current

Table 5.15 Full Private National Income (billions of current dollars)

| Year | Full<br>Income | Full<br>Property<br>Income | Full<br>Labor<br>Income | Property<br>Share | Labor<br>Share |
|------|----------------|----------------------------|-------------------------|-------------------|----------------|
| 1948 | 974.8          | 90.6                       | 884.2                   | .093              | .907           |
| 1949 | 1,030.7        | 90.2                       | 940.5                   | .087              | .913           |
| 1950 | 1,096.9        | 96.4                       | 1,000.5                 | .088              | .912           |
| 1951 | 1,180.3        | 106.5                      | 1,073.8                 | .090              | .910           |
| 1952 | 1,242.0        | 107.4                      | 1,134.6                 | .086              | .914           |
| 1953 | 1,356.3        | 110.1                      | 1,246.3                 | .081              | .919           |
| 1954 | 1,445.2        | 113.6                      | 1,331.6                 | .079              | .921           |
| 1955 | 1,509.2        | 133.8                      | 1,375.4                 | .089              | .911           |
| 1956 | 1,592.9        | 132.7                      | 1,460.2                 | .083              | .917           |
| 1957 | 1,735.0        | 134.3                      | 1,600.7                 | .077              | .923           |
| 1958 | 1,858.9        | 129.6                      | 1,729.3                 | .070              | .930           |
| 1959 | 1,926.5        | 150.9                      | 1,775.6                 | .078              | .922           |
| 1960 | 2,002.8        | 150.1                      | 1,852.8                 | .075              | .925           |
| 1961 | 2,138.0        | 153.4                      | 1,984.6                 | .072              | .928           |
| 1962 | 2,247.7        | 171.2                      | 2,076.5                 | .076              | .924           |
| 1963 | 2,332.8        | 188.2                      | 2,144.6                 | .081              | .919           |
| 1964 | 2,565.4        | 210.1                      | 2,355.3                 | .082              | .918           |
| 1965 | 2,739.3        | 239.1                      | 2,500.2                 | .087              | .913           |
| 1966 | 2,950.6        | 256.5                      | 2,694.1                 | .087              | .913           |
| 1967 | 3,141.8        | 259.9                      | 2,881.9                 | .083              | .917           |
| 1968 | 3,364.3        | 263.6                      | 3,100.7                 | .078              | .922           |
| 1969 | 3,605.2        | 266.2                      | 3,339.0                 | .074              | .926           |
| 1970 | 4,029.9        | 273.8                      | 3,756.1                 | .068              | .932           |
| 1971 | 4,517.6        | 301.6                      | 4,216.1                 | .067              | .933           |
| 1972 | 4,749.3        | 339.2                      | 4,410.1                 | .071              | .929           |
| 1973 | 5,149.4        | 367.9                      | 4,781.5                 | .071              | .929           |
| 1974 | 5,632.3        | 374.0                      | 5,258.3                 | .066              | .934           |
| 1975 | 6,319.3        | 455.2                      | 5,864.1                 | .072              | .928           |
| 1976 | 6,756.8        | 517.3                      | 6,239.5                 | .077              | .923           |
| 1977 | 7,331.1        | 600.9                      | 6,730.2                 | .082              | .918           |
| 1978 | 7,846.5        | 680.2                      | 7,166.3                 | .087              | .913           |
| 1979 | 8,846.1        | 744.1                      | 8,102.0                 | .084              | .916           |
| 1980 | 9,666.9        | 808.6                      | 8,858.3                 | .084              | .916           |
| 1981 | 10,555.8       | 972.0                      | 9,583.9                 | .092              | .908           |
| 1982 | 11,410.5       | 1,085.1                    | 10,325.4                | .095              | .905           |
| 1983 | 12,268.7       | 1,212.9                    | 11,055.7                | .099              | .901           |
| 1984 | 13,251.8       | 1,411.4                    | 11,840.4                | .107              | .893           |

and constant prices and in per capita terms. The growth rate of national income in constant prices was positive throughout the period, averaging 1.89 percent per year. The growth rate of property income in constant prices was considerably greater than that of labor income. The growth rate of property income averaged 3.64 percent per year, while the growth rate of labor income averaged only 1.73 percent.

**Table 5.16 Full Private National Income (billions of constant dollars)**

| Year | Full Income |       | Property Income |       | Labor Income |       |
|------|-------------|-------|-----------------|-------|--------------|-------|
|      | Quantity    | Price | Quantity        | Price | Quantity     | Price |
| 1949 | 6,013.2     | .171  | 338.6           | .266  | 5,692.5      | .165  |
| 1950 | 6,110.8     | .180  | 350.6           | .275  | 5,774.5      | .173  |
| 1951 | 6,243.7     | .189  | 358.1           | .297  | 5,900.3      | .182  |
| 1952 | 6,367.0     | .195  | 367.2           | .292  | 6,013.7      | .189  |
| 1953 | 6,511.1     | .208  | 377.8           | .291  | 6,146.3      | .203  |
| 1954 | 6,638.8     | .218  | 389.9           | .291  | 6,260.3      | .213  |
| 1955 | 6,761.8     | .223  | 402.1           | .333  | 6,369.1      | .216  |
| 1956 | 6,896.3     | .231  | 413.8           | .321  | 6,490.3      | .225  |
| 1957 | 7,076.3     | .245  | 424.0           | .317  | 6,660.5      | .240  |
| 1958 | 7,238.2     | .257  | 436.2           | .297  | 6,809.8      | .254  |
| 1959 | 7,333.4     | .263  | 446.0           | .338  | 6,894.3      | .258  |
| 1960 | 7,504.8     | .267  | 455.4           | .330  | 7,056.7      | .263  |
| 1961 | 7,700.4     | .278  | 464.5           | .330  | 7,244.0      | .274  |
| 1962 | 7,836.4     | .287  | 475.9           | .360  | 7,368.1      | .282  |
| 1963 | 8,007.2     | .291  | 490.7           | .384  | 7,522.8      | .285  |
| 1964 | 8,187.1     | .313  | 506.0           | .415  | 7,686.1      | .306  |
| 1965 | 8,295.0     | .330  | 526.7           | .454  | 7,768.0      | .322  |
| 1966 | 8,409.4     | .351  | 548.3           | .468  | 7,855.2      | .343  |
| 1967 | 8,595.2     | .366  | 574.6           | .452  | 8,010.2      | .360  |
| 1968 | 8,806.3     | .382  | 605.4           | .436  | 8,186.9      | .379  |
| 1969 | 9,049.6     | .398  | 631.6           | .421  | 8,402.5      | .397  |
| 1970 | 9,304.2     | .433  | 651.7           | .420  | 8,636.6      | .435  |
| 1971 | 9,553.2     | .473  | 678.9           | .444  | 8,858.5      | .476  |
| 1972 | 9,614.8     | .494  | 710.8           | .477  | 8,889.5      | .496  |
| 1973 | 9,717.0     | .530  | 736.7           | .499  | 8,966.5      | .533  |
| 1974 | 9,881.6     | .570  | 772.6           | .484  | 9,097.8      | .578  |
| 1975 | 10,130.2    | .624  | 807.0           | .564  | 9,313.6      | .630  |
| 1976 | 10,302.8    | .656  | 867.9           | .596  | 9,429.8      | .662  |
| 1977 | 10,540.1    | .696  | 913.0           | .658  | 9,624.0      | .699  |
| 1978 | 10,711.6    | .733  | 943.4           | .721  | 9,765.6      | .734  |
| 1979 | 10,877.8    | .813  | 971.8           | .766  | 9,903.9      | .818  |
| 1980 | 11,076.1    | .873  | 1,001.0         | .808  | 10,073.8     | .879  |
| 1981 | 11,257.5    | .938  | 1,043.8         | .931  | 10,213.6     | .938  |
| 1982 | 11,410.5    | 1.000 | 1,085.1         | 1.000 | 10,325.4     | 1.000 |
| 1983 | 11,552.4    | 1.062 | 1,151.1         | 1.054 | 10,401.6     | 1.063 |
| 1984 | 11,655.9    | 1.137 | 1,212.6         | 1.164 | 10,443.1     | 1.134 |

To complete the income and expenditure account for the private national sector of the U.S. economy, we add government transfer payments to persons, other than benefits from social insurance funds, to full national income to obtain national receipts. To allocate the value of receipts between consumption and saving, we first estimate the value of full consumption. Full consumption is the sum of the consumption of market goods and services, as defined by Fraumeni and Jorgenson,

**Table 5.17 Full Private National Income Rates of Growth, 1949–84**

|                              | 1949–84 | 1949–53 | 1953–57 | 1957–60 | 1960–66 | 1966–69 | 1969–73 | 1973–79 | 1979–84 |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Full national income:</b> |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.30    | 6.86    | 6.16    | 4.78    | 6.46    | 6.68    | 8.91    | 9.02    | 8.08    |
| Constant prices              | 1.89    | 1.99    | 2.08    | 1.96    | 1.90    | 2.45    | 1.78    | 1.88    | 1.38    |
| Constant prices <sup>a</sup> | .60     | .33     | .31     | .15     | .45     | 1.35    | .81     | 1.04    | .33     |
| Price index                  | 5.41    | 4.90    | 4.09    | 2.87    | 4.56    | 4.19    | 7.16    | 7.13    | 6.71    |
| <b>Full labor income:</b>    |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.24    | 7.04    | 6.26    | 4.88    | 6.24    | 7.15    | 8.98    | 8.79    | 7.59    |
| Constant prices              | 1.73    | 1.92    | 2.01    | 1.93    | 1.79    | 2.25    | 1.62    | 1.66    | 1.06    |
| Constant prices <sup>a</sup> | .44     | .26     | .24     | .12     | .34     | 1.15    | .66     | .81     | .01     |
| Price index                  | 5.51    | 5.18    | 4.19    | 3.05    | 4.43    | 4.87    | 7.36    | 7.14    | 6.53    |
| <b>Full property income:</b> |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.86    | 4.98    | 4.97    | 3.71    | 8.93    | 1.24    | 8.09    | 11.74   | 12.80   |
| Constant prices              | 3.64    | 2.74    | 2.88    | 2.38    | 3.09    | 4.71    | 3.85    | 4.62    | 4.43    |
| Constant prices <sup>a</sup> | 2.35    | 1.08    | 1.11    | .57     | 1.64    | 3.62    | 2.88    | 3.77    | 3.38    |
| Price index                  | 4.22    | 2.25    | 2.14    | 1.34    | 5.82    | -3.53   | 4.25    | 7.14    | 8.37    |

<sup>a</sup>This data calculated on a per capita basis.

and our estimates of the value of household production and leisure. Next, we estimate the value of full savings. Full saving is the sum of saving in the form of nonhuman capital, again as defined by Fraumeni and Jorgenson, and our estimates of saving in the form of human capital. We present estimates of full receipts and expenditures for the year 1982 in table 5.18.

Our next objective is to allocate the value of full receipts for the private national sector of the U.S. economy between consumption and

**Table 5.18**                    **Gross Private National Receipts and Expenditures, 1982 (billions of current dollars)**

| Receipts     |   |          |
|--------------|---|----------|
| 1.           | Gross private domestic factor outlay  | 2,921.9  |
| 2.           | + Income originating in general government (table 1.7, line 12)   | 343.9    |
| 3.           | + Compensation of employees in government enterprises (table 6.4, lines 81, 86)                                       | 39.6     |
| 4.           | + Income originating in rest of world (table 6.1, line 82)  | 51.2     |
| 5.           | + Investment income of social insurance funds (table 3.13, lines 7, 18)   | 39.9     |
| 6.           | - Transfer to general government from social insurance funds (table 3.13, lines 9, 20)                                | 6.9      |
| 7.           | + Net interest paid by government (table 1.9, line 16 plus line 12, minus table 3.1, line 18, and table 2.1, line 28) | 39.0     |
| 8.           | - Corporate profits tax liability (tables 3.2, line 6, and 3.3, line 6)   | 63.0     |
| 9.           | - Business property taxes (table 3.5, lines 24, 25, 26, 27)   | 102.2    |
| 10.          | - Personal tax and nontax payments (table 2.1, line 24)   | 409.3    |
| 11.          | + Personal nontax payments (tables 3.4, lines 8, 15)  | 43.5     |
| 12.          | = Gross private national income   | 2,897.5  |
| 13.          | + Nonmarket labor income  | 8,513.1  |
| 14.          | = Full gross private national income  | 11,410.7 |
| 15.          | + Government transfer payment to persons other than benefits from social insurance funds (table 3.11, lines 1, 3, 29) | 99.6     |
| 16.          | = Full gross private national consumer receipts   | 11,510.3 |
| Expenditures |   |          |
| 1.           | Personal consumption expenditures (table 1.1, line 2)   | 2,050.7  |
| 2.           | - Personal consumption expenditures, durable goods (table 1.1, line 3)  | 252.7    |
| 3.           | + Imputation for nonhuman capital services  | 338.7    |
| 4.           | = Private national consumption expenditure  | 2,136.7  |
| 5.           | + Consumption of nonmarket goods and services   | 3,944.5  |
| 6.           | = Full private national consumption expenditure   | 6,081.2  |
| 7.           | + Personal transfer payments to foreigners (table 2.1, line 29)   | 1.3      |
| 8.           | + Personal nontax payments (table 3.4, lines 8, 15)   | 43.5     |
| 9.           | = Full private national consumer outlays  | 6,126.0  |
| 10.          | + Full gross private national saving <sup>a</sup>   | 5,384.4  |
| 11.          | = Full private national expenditures  | 11,510.3 |

*Note:* All table references are to the NIPA tables in the March 1986 *Survey of Current Business*.

<sup>a</sup>See table 5.26, line 14, below.

saving for the period 1948–84. We first estimate the value of consumer outlays for all years. We present estimates of market consumer outlays, nonmarket consumer outlays, and full consumer outlays in current prices in table 5.19 and in constant prices in table 5.20. The value of consumer outlays in nonmarket goods and services predominates in consumer outlays, averaging around 65 percent of outlays over the period 1948–84. The market share of full consumer outlays reached a

**Table 5.19 Full Consumer Outlays (billions of current dollars)**

| Year | Full Consumer Outlays | Market Consumer Outlays | Nonmarket Consumer Outlays | Market Share | Nonmarket Share |
|------|-----------------------|-------------------------|----------------------------|--------------|-----------------|
| 1948 | 522.0                 | 182.1                   | 339.9                      | .349         | .651            |
| 1949 | 553.6                 | 183.8                   | 369.9                      | .332         | .668            |
| 1950 | 585.9                 | 195.6                   | 390.4                      | .334         | .666            |
| 1951 | 620.1                 | 215.1                   | 404.9                      | .347         | .653            |
| 1952 | 647.8                 | 227.5                   | 420.3                      | .351         | .649            |
| 1953 | 702.0                 | 239.3                   | 462.6                      | .341         | .659            |
| 1954 | 747.5                 | 248.3                   | 499.3                      | .332         | .668            |
| 1955 | 770.6                 | 265.0                   | 505.6                      | .344         | .656            |
| 1956 | 808.8                 | 276.3                   | 532.5                      | .342         | .658            |
| 1957 | 868.8                 | 289.5                   | 579.3                      | .333         | .667            |
| 1958 | 933.1                 | 299.8                   | 633.3                      | .321         | .679            |
| 1959 | 962.3                 | 322.3                   | 640.0                      | .335         | .665            |
| 1960 | 1,000.6               | 335.3                   | 665.3                      | .335         | .665            |
| 1961 | 1,065.6               | 348.8                   | 716.8                      | .327         | .673            |
| 1962 | 1,115.3               | 368.8                   | 746.5                      | .331         | .669            |
| 1963 | 1,157.0               | 390.4                   | 766.6                      | .337         | .663            |
| 1964 | 1,263.0               | 421.6                   | 841.5                      | .334         | .666            |
| 1965 | 1,366.6               | 457.6                   | 909.0                      | .335         | .665            |
| 1966 | 1,480.7               | 495.0                   | 985.7                      | .334         | .666            |
| 1967 | 1,575.7               | 520.0                   | 1,055.7                    | .330         | .670            |
| 1968 | 1,678.9               | 559.8                   | 1,119.1                    | .333         | .667            |
| 1969 | 1,797.8               | 603.1                   | 1,194.7                    | .335         | .665            |
| 1970 | 1,998.8               | 652.4                   | 1,346.5                    | .326         | .674            |
| 1971 | 2,220.6               | 698.7                   | 1,521.9                    | .315         | .685            |
| 1972 | 2,390.8               | 768.9                   | 1,621.9                    | .322         | .678            |
| 1973 | 2,634.3               | 843.0                   | 1,791.2                    | .320         | .680            |
| 1974 | 2,888.1               | 920.1                   | 1,968.1                    | .319         | .681            |
| 1975 | 3,213.3               | 1,031.1                 | 2,182.2                    | .321         | .679            |
| 1976 | 3,510.6               | 1,146.1                 | 2,364.5                    | .326         | .674            |
| 1977 | 3,800.6               | 1,280.3                 | 2,520.3                    | .337         | .663            |
| 1978 | 4,162.2               | 1,429.8                 | 2,732.5                    | .344         | .656            |
| 1979 | 4,685.4               | 1,595.1                 | 3,090.3                    | .340         | .660            |
| 1980 | 5,064.9               | 1,775.2                 | 3,289.7                    | .350         | .650            |
| 1981 | 5,550.6               | 1,989.6                 | 3,561.0                    | .358         | .642            |
| 1982 | 6,126.0               | 2,181.5                 | 3,944.5                    | .356         | .644            |
| 1983 | 6,635.5               | 2,360.9                 | 4,274.7                    | .356         | .644            |
| 1984 | 7,184.5               | 2,593.6                 | 4,590.9                    | .361         | .639            |

Table 5.20 Full Consumer Outlays (billions of constant dollars)

| Year | Full Consumer Outlays |       | Market Consumer Outlays |       | Nonmarket Consumer Outlays |       |
|------|-----------------------|-------|-------------------------|-------|----------------------------|-------|
|      | Quantity              | Price | Quantity                | Price | Quantity                   | Price |
| 1949 | 2,727.1               | .203  | 695.9                   | .264  | 2,076.9                    | .178  |
| 1950 | 2,784.7               | .210  | 725.5                   | .270  | 2,098.9                    | .186  |
| 1951 | 2,828.5               | .219  | 751.8                   | .286  | 2,110.1                    | .192  |
| 1952 | 2,885.0               | .225  | 776.1                   | .293  | 2,138.2                    | .197  |
| 1953 | 2,958.2               | .237  | 799.9                   | .299  | 2,186.7                    | .212  |
| 1954 | 3,014.8               | .248  | 816.4                   | .304  | 2,226.8                    | .224  |
| 1955 | 3,091.4               | .249  | 864.6                   | .306  | 2,246.1                    | .225  |
| 1956 | 3,152.1               | .257  | 891.8                   | .310  | 2,276.4                    | .234  |
| 1957 | 3,223.8               | .269  | 915.1                   | .316  | 2,324.3                    | .249  |
| 1958 | 3,295.0               | .283  | 926.6                   | .324  | 2,386.5                    | .265  |
| 1959 | 3,363.7               | .286  | 971.9                   | .332  | 2,404.2                    | .266  |
| 1960 | 3,424.6               | .292  | 992.8                   | .338  | 2,443.7                    | .272  |
| 1961 | 3,523.3               | .302  | 1,020.0                 | .342  | 2,515.8                    | .285  |
| 1962 | 3,606.9               | .309  | 1,061.7                 | .347  | 2,554.6                    | .292  |
| 1963 | 3,701.4               | .313  | 1,103.1                 | .354  | 2,605.3                    | .294  |
| 1964 | 3,815.9               | .331  | 1,169.7                 | .360  | 2,648.0                    | .318  |
| 1965 | 3,932.4               | .348  | 1,242.2                 | .368  | 2,687.9                    | .338  |
| 1966 | 4,044.1               | .366  | 1,305.9                 | .379  | 2,733.8                    | .361  |
| 1967 | 4,152.6               | .379  | 1,351.6                 | .385  | 2,796.1                    | .378  |
| 1968 | 4,258.3               | .394  | 1,400.5                 | .400  | 2,852.6                    | .392  |
| 1969 | 4,358.2               | .413  | 1,446.9                 | .417  | 2,905.6                    | .411  |
| 1970 | 4,487.3               | .445  | 1,501.3                 | .435  | 2,980.4                    | .452  |
| 1971 | 4,621.9               | .480  | 1,538.3                 | .454  | 3,077.4                    | .495  |
| 1972 | 4,771.3               | .501  | 1,623.7                 | .474  | 3,144.0                    | .516  |
| 1973 | 4,875.9               | .540  | 1,680.2                 | .502  | 3,194.0                    | .561  |
| 1974 | 4,964.4               | .582  | 1,673.9                 | .550  | 3,285.3                    | .599  |
| 1975 | 5,151.4               | .624  | 1,739.9                 | .593  | 3,406.3                    | .641  |
| 1976 | 5,312.1               | .661  | 1,826.1                 | .628  | 3,483.1                    | .679  |
| 1977 | 5,460.0               | .696  | 1,908.5                 | .671  | 3,550.5                    | .710  |
| 1978 | 5,584.0               | .745  | 1,989.1                 | .719  | 3,596.0                    | .760  |
| 1979 | 5,729.4               | .818  | 2,039.2                 | .782  | 3,691.1                    | .837  |
| 1980 | 5,841.7               | .867  | 2,058.4                 | .862  | 3,783.5                    | .869  |
| 1981 | 5,962.0               | .931  | 2,106.5                 | .944  | 3,855.6                    | .924  |
| 1982 | 6,126.0               | 1.000 | 2,181.5                 | 1.000 | 3,944.5                    | 1.000 |
| 1983 | 6,256.6               | 1.061 | 2,257.0                 | 1.046 | 3,999.9                    | 1.069 |
| 1984 | 6,398.0               | 1.123 | 2,378.5                 | 1.090 | 4,022.1                    | 1.141 |

minimum of 0.315 in 1971 and has risen to a maximum of 0.361 in 1984 at the end of the period, a rise of 15 percent; however, there is almost no trend in this share for the period as a whole. The price of nonmarket consumer outlays has increased more rapidly than the price of market outlays. Constancy of the market share has been maintained by a more rapid growth at market consumer outlays in constant prices.



We combine our estimates of saving in the form of human capital with estimates of saving in the form of nonhuman capital, based on those of Fraumeni and Jorgenson, to obtain the value of full saving. We present estimates of saving in the form of human capital, saving in the form of nonhuman capital, and full saving in current prices in table 5.21 and constant prices in table 5.22. The share of saving in the form of human capital greatly predominates, ranging from 0.881 in 1961 to 0.829 in 1984, a very modest decline. The price of saving in the form

**Table 5.21 Full Gross Private National Saving (billions of current dollars)**

| Year | Full Saving | Nonhuman Saving | Human Saving | Nonhuman Share | Human Share |
|------|-------------|-----------------|--------------|----------------|-------------|
| 1948 | 460.3       | 67.4            | 392.9        | .146           | .854        |
| 1949 | 483.8       | 68.3            | 415.5        | .141           | .859        |
| 1950 | 518.6       | 77.3            | 441.3        | .149           | .851        |
| 1951 | 566.4       | 89.2            | 477.2        | .157           | .843        |
| 1952 | 600.2       | 91.3            | 508.9        | .152           | .848        |
| 1953 | 660.7       | 97.0            | 563.7        | .147           | .853        |
| 1954 | 704.1       | 96.5            | 607.6        | .137           | .863        |
| 1955 | 745.2       | 109.3           | 635.9        | .147           | .853        |
| 1956 | 791.0       | 112.4           | 678.6        | .142           | .858        |
| 1957 | 873.5       | 118.3           | 755.2        | .135           | .865        |
| 1958 | 933.9       | 114.4           | 819.5        | .122           | .878        |
| 1959 | 971.9       | 125.4           | 846.5        | .129           | .871        |
| 1960 | 1,010.4     | 125.7           | 884.7        | .124           | .876        |
| 1961 | 1,081.2     | 128.7           | 952.5        | .119           | .881        |
| 1962 | 1,141.4     | 145.3           | 996.1        | .127           | .873        |
| 1963 | 1,185.3     | 154.0           | 1,031.3      | .130           | .870        |
| 1964 | 1,312.7     | 172.2           | 1,140.5      | .131           | .869        |
| 1965 | 1,384.0     | 190.8           | 1,193.2      | .138           | .862        |
| 1966 | 1,482.0     | 213.7           | 1,268.3      | .144           | .856        |
| 1967 | 1,580.8     | 225.1           | 1,355.7      | .142           | .858        |
| 1968 | 1,702.7     | 236.0           | 1,466.7      | .139           | .861        |
| 1969 | 1,827.9     | 245.0           | 1,582.9      | .134           | .866        |
| 1970 | 2,056.0     | 259.8           | 1,796.2      | .126           | .874        |
| 1971 | 2,327.6     | 298.0           | 2,029.6      | .128           | .872        |
| 1972 | 2,392.7     | 324.4           | 2,068.3      | .136           | .864        |
| 1973 | 2,553.2     | 383.0           | 2,170.2      | .150           | .850        |
| 1974 | 2,789.8     | 392.7           | 2,397.1      | .141           | .859        |
| 1975 | 3,163.1     | 440.9           | 2,722.2      | .139           | .861        |
| 1976 | 3,306.7     | 489.3           | 2,817.4      | .148           | .852        |
| 1977 | 3,593.1     | 545.8           | 3,047.3      | .152           | .848        |
| 1978 | 3,752.7     | 631.6           | 3,121.1      | .168           | .832        |
| 1979 | 4,236.1     | 690.9           | 3,545.2      | .163           | .837        |
| 1980 | 4,691.4     | 716.7           | 3,974.7      | .153           | .847        |
| 1981 | 5,102.5     | 813.1           | 4,289.4      | .159           | .841        |
| 1982 | 5,384.4     | 815.8           | 4,568.6      | .152           | .848        |
| 1983 | 5,739.7     | 896.6           | 4,843.1      | .156           | .844        |
| 1984 | 6,178.7     | 1,055.5         | 5,123.2      | .171           | .829        |

**Table 5.22 Full Gross Private National Saving (billions of constant dollars)**

| Year | Full Saving |       | Nonhuman Saving |       | Human Saving |       |
|------|-------------|-------|-----------------|-------|--------------|-------|
|      | Quantity    | Price | Quantity        | Price | Quantity     | Price |
| 1949 | 2,864.8     | .169  | 239.5           | .285  | 2,669.1      | .156  |
| 1950 | 2,975.7     | .174  | 299.4           | .258  | 2,686.5      | .164  |
| 1951 | 3,044.3     | .186  | 301.2           | .296  | 2,756.9      | .173  |
| 1952 | 3,073.8     | .195  | 287.4           | .318  | 2,812.6      | .181  |
| 1953 | 3,155.4     | .209  | 300.3           | .323  | 2,878.3      | .196  |
| 1954 | 3,224.9     | .218  | 298.0           | .324  | 2,956.1      | .206  |
| 1955 | 3,373.2     | .221  | 350.3           | .312  | 3,032.9      | .210  |
| 1956 | 3,433.0     | .230  | 343.2           | .328  | 3,106.6      | .218  |
| 1957 | 3,537.6     | .247  | 336.7           | .351  | 3,226.6      | .234  |
| 1958 | 3,589.4     | .260  | 315.6           | .363  | 3,312.7      | .247  |
| 1959 | 3,691.5     | .263  | 360.2           | .348  | 3,356.2      | .252  |
| 1960 | 3,761.6     | .269  | 353.7           | .355  | 3,438.3      | .257  |
| 1961 | 3,873.3     | .279  | 352.8           | .365  | 3,556.0      | .268  |
| 1962 | 3,973.6     | .287  | 392.8           | .370  | 3,606.4      | .276  |
| 1963 | 4,091.6     | .290  | 419.0           | .368  | 3,694.2      | .279  |
| 1964 | 4,229.9     | .310  | 455.7           | .378  | 3,790.0      | .301  |
| 1965 | 4,297.6     | .322  | 506.2           | .377  | 3,797.7      | .314  |
| 1966 | 4,336.2     | .342  | 549.4           | .389  | 3,786.3      | .335  |
| 1967 | 4,402.9     | .359  | 552.1           | .408  | 3,851.1      | .352  |
| 1968 | 4,514.8     | .377  | 572.6           | .412  | 3,941.8      | .372  |
| 1969 | 4,654.6     | .393  | 582.6           | .420  | 4,072.2      | .389  |
| 1970 | 4,789.1     | .429  | 572.9           | .453  | 4,218.3      | .426  |
| 1971 | 4,963.6     | .469  | 629.0           | .474  | 4,335.4      | .468  |
| 1972 | 4,944.6     | .484  | 676.9           | .479  | 4,268.6      | .485  |
| 1973 | 5,003.0     | .510  | 764.6           | .501  | 4,240.4      | .512  |
| 1974 | 4,973.5     | .561  | 720.9           | .545  | 4,253.6      | .564  |
| 1975 | 5,019.2     | .630  | 696.2           | .633  | 4,323.7      | .630  |
| 1976 | 5,076.7     | .651  | 748.6           | .654  | 4,328.4      | .651  |
| 1977 | 5,216.0     | .689  | 798.5           | .684  | 4,418.0      | .690  |
| 1978 | 5,305.7     | .707  | 857.6           | .737  | 4,447.7      | .702  |
| 1979 | 5,350.5     | .792  | 862.2           | .801  | 4,487.8      | .790  |
| 1980 | 5,379.2     | .872  | 818.9           | .875  | 4,560.3      | .872  |
| 1981 | 5,430.2     | .940  | 854.3           | .952  | 4,575.7      | .937  |
| 1982 | 5,384.4     | 1.000 | 815.8           | 1.000 | 4,568.6      | 1.000 |
| 1983 | 5,428.9     | 1.057 | 886.8           | 1.011 | 4,543.7      | 1.066 |
| 1984 | 5,527.8     | 1.118 | 1,028.4         | 1.026 | 4,510.4      | 1.136 |

of human capital has risen more rapidly than the price of nonhuman saving, but the growth of nonhuman saving in constant prices has been much more rapid than the growth of human saving.

We combine our estimates of full consumer outlays with our estimates of saving in the form of human and nonhuman capital to obtain the value of full expenditures. We present estimates of full consumer outlays, saving, and expenditures in current prices in table 5.23 and in

Table 5.23 Full Private National Expenditures (billions of current dollars)

| Year | Full Expenditures | Full Consumer Outlays | Full Saving | Outlays Share | Saving Share |
|------|-------------------|-----------------------|-------------|---------------|--------------|
| 1948 | 982.3             | 522.0                 | 460.3       | .531          | .469         |
| 1949 | 1,037.4           | 553.6                 | 483.8       | .534          | .466         |
| 1950 | 1,104.5           | 585.9                 | 518.6       | .530          | .470         |
| 1951 | 1,186.5           | 620.1                 | 566.4       | .523          | .477         |
| 1952 | 1,248.0           | 647.8                 | 600.2       | .519          | .481         |
| 1953 | 1,362.6           | 702.0                 | 660.7       | .515          | .485         |
| 1954 | 1,451.7           | 747.5                 | 704.1       | .515          | .485         |
| 1955 | 1,515.8           | 770.6                 | 745.2       | .508          | .492         |
| 1956 | 1,599.7           | 808.8                 | 791.0       | .506          | .494         |
| 1957 | 1,742.3           | 868.8                 | 873.5       | .499          | .501         |
| 1958 | 1,867.0           | 933.1                 | 933.9       | .500          | .500         |
| 1959 | 1,934.2           | 962.3                 | 971.9       | .498          | .502         |
| 1960 | 2,011.0           | 1,000.6               | 1,010.4     | .498          | .502         |
| 1961 | 2,146.8           | 1,065.6               | 1,081.2     | .496          | .504         |
| 1962 | 2,256.7           | 1,115.3               | 1,141.4     | .494          | .506         |
| 1963 | 2,342.3           | 1,157.0               | 1,185.3     | .494          | .506         |
| 1964 | 2,575.7           | 1,263.0               | 1,312.7     | .490          | .510         |
| 1965 | 2,750.5           | 1,366.6               | 1,384.0     | .497          | .503         |
| 1966 | 2,962.7           | 1,480.7               | 1,482.0     | .500          | .500         |
| 1967 | 3,156.5           | 1,575.7               | 1,580.8     | .499          | .501         |
| 1968 | 3,381.6           | 1,678.9               | 1,702.7     | .496          | .504         |
| 1969 | 3,625.7           | 1,797.8               | 1,827.9     | .496          | .504         |
| 1970 | 4,054.8           | 1,998.8               | 2,056.0     | .493          | .507         |
| 1971 | 4,548.2           | 2,220.6               | 2,327.6     | .488          | .512         |
| 1972 | 4,783.5           | 2,390.8               | 2,392.7     | .500          | .500         |
| 1973 | 5,187.5           | 2,634.3               | 2,553.2     | .508          | .492         |
| 1974 | 5,677.9           | 2,888.1               | 2,789.8     | .509          | .491         |
| 1975 | 6,376.4           | 3,213.3               | 3,163.1     | .504          | .496         |
| 1976 | 6,817.3           | 3,510.6               | 3,306.7     | .515          | .485         |
| 1977 | 7,393.7           | 3,800.6               | 3,593.1     | .514          | .486         |
| 1978 | 7,914.9           | 4,162.2               | 3,752.7     | .526          | .474         |
| 1979 | 8,921.5           | 4,685.4               | 4,236.1     | .525          | .475         |
| 1980 | 9,756.3           | 5,064.9               | 4,691.4     | .519          | .481         |
| 1981 | 10,653.1          | 5,550.6               | 5,102.5     | .521          | .479         |
| 1982 | 11,510.3          | 6,126.0               | 5,384.4     | .532          | .468         |
| 1983 | 12,375.3          | 6,635.5               | 5,739.7     | .536          | .464         |
| 1984 | 13,363.2          | 7,184.5               | 6,178.7     | .538          | .462         |

constant prices in table 5.24. The share of consumer outlays slightly predominates in full expenditures for most of the period, ranging from 0.490 in 1964 to 0.538 in 1984. The share of saving has trended downward since 1970. The price of saving has risen relative to the price of consumer outlays, but the growth rate of outlays in constant prices has been considerably greater than the growth rate of saving.

**Table 5.24 Full Private National Expenditures (billions of constant dollars)**

| Year | Full Expenditures |       | Consumer Outlays |       | Full Saving |       |
|------|-------------------|-------|------------------|-------|-------------|-------|
|      | Quantity          | Price | Quantity         | Price | Quantity    | Price |
| 1949 | 5,592.9           | .185  | 2,727.1          | .203  | 2,864.8     | .169  |
| 1950 | 5,756.8           | .192  | 2,784.7          | .210  | 2,975.7     | .174  |
| 1951 | 5,867.3           | .202  | 2,828.5          | .219  | 3,044.3     | .186  |
| 1952 | 5,955.5           | .210  | 2,885.0          | .225  | 3,073.8     | .195  |
| 1953 | 6,110.0           | .223  | 2,958.2          | .237  | 3,155.4     | .209  |
| 1954 | 6,235.4           | .233  | 3,014.8          | .248  | 3,224.9     | .218  |
| 1955 | 6,456.3           | .235  | 3,091.4          | .249  | 3,373.2     | .221  |
| 1956 | 6,576.9           | .243  | 3,152.1          | .257  | 3,433.0     | .230  |
| 1957 | 6,751.8           | .258  | 3,223.8          | .269  | 3,537.6     | .247  |
| 1958 | 6,875.7           | .272  | 3,295.0          | .283  | 3,589.4     | .260  |
| 1959 | 7,045.2           | .275  | 3,363.7          | .286  | 3,691.5     | .263  |
| 1960 | 7,175.9           | .280  | 3,424.6          | .292  | 3,761.6     | .269  |
| 1961 | 7,385.8           | .291  | 3,523.3          | .302  | 3,873.3     | .279  |
| 1962 | 7,569.1           | .298  | 3,606.9          | .309  | 3,973.6     | .287  |
| 1963 | 7,780.8           | .301  | 3,701.4          | .313  | 4,091.6     | .290  |
| 1964 | 8,032.8           | .321  | 3,815.9          | .331  | 4,229.9     | .310  |
| 1965 | 8,218.8           | .335  | 3,932.4          | .348  | 4,297.6     | .322  |
| 1966 | 8,371.8           | .354  | 4,044.1          | .366  | 4,336.2     | .342  |
| 1967 | 8,548.3           | .369  | 4,152.6          | .379  | 4,402.9     | .359  |
| 1968 | 8,765.7           | .386  | 4,258.3          | .394  | 4,514.8     | .377  |
| 1969 | 9,004.4           | .403  | 4,358.2          | .413  | 4,654.6     | .393  |
| 1970 | 9,267.8           | .438  | 4,487.3          | .445  | 4,789.1     | .429  |
| 1971 | 9,576.2           | .475  | 4,621.9          | .480  | 4,963.6     | .469  |
| 1972 | 9,709.0           | .493  | 4,771.3          | .501  | 4,944.6     | .484  |
| 1973 | 9,873.1           | .525  | 4,875.9          | .540  | 5,003.0     | .510  |
| 1974 | 9,934.8           | .572  | 4,964.4          | .582  | 4,973.5     | .561  |
| 1975 | 10,168.4          | .627  | 5,151.4          | .624  | 5,019.2     | .630  |
| 1976 | 10,386.6          | .656  | 5,312.1          | .661  | 5,076.7     | .651  |
| 1977 | 10,673.7          | .693  | 5,460.0          | .696  | 5,216.0     | .689  |
| 1978 | 10,887.9          | .727  | 5,584.0          | .745  | 5,305.7     | .707  |
| 1979 | 11,080.0          | .805  | 5,729.4          | .818  | 5,350.5     | .792  |
| 1980 | 11,221.6          | .869  | 5,841.7          | .867  | 5,379.2     | .872  |
| 1981 | 11,392.7          | .935  | 5,962.0          | .931  | 5,430.2     | .940  |
| 1982 | 11,510.3          | 1.000 | 6,126.0          | 1.000 | 5,384.4     | 1.000 |
| 1983 | 11,685.5          | 1.059 | 6,256.6          | 1.061 | 5,428.9     | 1.057 |
| 1984 | 11,925.9          | 1.121 | 6,398.0          | 1.123 | 5,527.8     | 1.118 |

We next analyze the structure of full private national expenditures by presenting growth rates of full expenditures, consumer outlays, and saving in current and constant prices for the period 1948–84 and for eight subperiods in table 5.25. We also give growth rates of expenditures, outlays, and saving in constant prices per capita. The growth rate of consumer outlays per capita averaged 1.14 percent per year for

**Table 5.25 Full Private National Expenditures, Rates of Growth, 1949–84**

|                               | 1949–84 | 1949–53 | 1953–57 | 1957–60 | 1960–66 | 1966–69 | 1969–73 | 1973–79 | 1979–84 |
|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Full expenditures:</b>     |         |         |         |         |         |         |         |         |         |
| Current prices                | 7.30    | 6.82    | 6.15    | 4.78    | 6.46    | 6.73    | 8.96    | 9.04    | 8.08    |
| Constant prices               | 2.16    | 2.21    | 2.50    | 2.03    | 2.57    | 2.43    | 2.30    | 1.92    | 1.47    |
| Constant prices <sup>a</sup>  | .87     | .55     | .73     | .22     | 1.12    | 1.33    | 1.33    | 1.08    | .42     |
| Price index                   | 5.15    | 4.67    | 3.64    | 2.73    | 3.91    | 4.32    | 6.61    | 7.12    | 6.62    |
| <b>Full consumer outlays:</b> |         |         |         |         |         |         |         |         |         |
| Current prices                | 7.32    | 5.94    | 5.33    | 4.71    | 6.53    | 6.47    | 9.55    | 9.60    | 8.55    |
| Constant prices               | 2.44    | 2.03    | 2.15    | 2.01    | 2.77    | 2.49    | 2.81    | 2.69    | 2.21    |
| Constant prices <sup>a</sup>  | 1.14    | .37     | .38     | .21     | 1.32    | 1.40    | 1.84    | 1.85    | 1.16    |
| Price index                   | 4.89    | 3.87    | 3.17    | 2.73    | 3.76    | 4.03    | 6.70    | 6.92    | 6.34    |
| <b>Full saving:</b>           |         |         |         |         |         |         |         |         |         |
| Current prices                | 7.28    | 7.79    | 6.98    | 4.85    | 6.38    | 6.99    | 8.35    | 8.44    | 7.55    |
| Constant prices               | 1.88    | 2.42    | 2.86    | 2.05    | 2.37    | 2.36    | 1.80    | 1.12    | .65     |
| Constant prices <sup>a</sup>  | .58     | .75     | 1.09    | .24     | .92     | 1.26    | .84     | .28     | -.40    |
| Price index                   | 5.40    | 5.31    | 4.18    | 2.84    | 4.00    | 4.63    | 6.52    | 7.34    | 6.89    |

<sup>a</sup>This data calculated on a per capita basis.

the period as a whole. Especially rapid growth has characterized the period since 1960, with only modest retardation after 1979. By contrast, the growth rate of saving per capita averaged only 0.58 percent per year for the period as a whole, with rapid growth in 1953–57 and 1966–69 and negative growth from 1979–84.

## 5.5 Accumulation and Wealth

Our final objective is to integrate our measures of saving in the form of human and nonhuman capital with measures of human and nonhuman wealth. For this purpose, we implement an accumulation account for the private national sector of the U.S. economy. This account includes saving in the form of human and nonhuman capital and depreciation on both forms of capital. Depreciation on human capital is due to aging, deaths, and emigration. Depreciation on nonhuman capital is due to deterioration and retirement of investment goods with age. The difference between saving and depreciation is the net saving of the private national sector.

The accumulation account also includes revaluation of human and nonhuman capital. Revaluation of human capital is due to changes in lifetime incomes for individuals of a given age, sex, and education. Revaluation of nonhuman capital is due to changes in asset values for investment goods of a given age. The change in the value of wealth from period to period is the sum of net saving and revaluation of capital. The value of saving in the form of human and nonhuman capital is equal to the value of capital formation in both forms. We add saving, depreciation, and revaluation in the form of nonhuman capital, as defined by Fraumeni and Jorgenson (1980), to our estimates of saving, depreciation, and revaluation in the form of human capital.

We present the accumulation account in current prices for the private national sector of the U.S. economy for the year 1982 in table 5.26. Human capital saving is very large by comparison with private national saving, which is very similar to the corresponding concept in the U.S. national accounts. Depreciation is a very large proportion of full gross private national saving, which includes human and nonhuman saving. Finally, in 1982, revaluation of human and nonhuman capital was far more important than net saving in the change in private national wealth. Saving in the accumulation account is equal to saving in the income and expenditure account; in the accumulation account saving is equal to capital formation.

Our next objective is to allocate change in wealth for the private national sector of the U.S. economy among revaluation, saving, and depreciation for the period 1948–84. We first estimate the value of saving and depreciation for all years. Our estimates of full gross saving,

**Table 5.26** Gross Private National Capital Accumulation, 1982  
(billions of current dollars)

| Saving            |   |          |
|-------------------|---|----------|
| 1.                | Personal saving (table 5.1, line 3)   | 153.9    |
| 2.                | + Undistributed corporate profits (table 5.1, line 5)   | 39.6     |
| 3.                | + Corporate inventory valuation adjustment (table 5.1, line 6)  | - 10.4   |
| 4.                | + Capital consumption adjustment (table 5.1, line 7)  | - 9.2    |
| 5.                | + Corporate capital consumption allowances with capital consumption adjustment (table 5.1, line 8)    | 235.0    |
| 6.                | + Noncorporate capital consumption allowances with capital consumption adjustment (table 5.1, line 9) | 148.2    |
| 7.                | + Private wage accruals less disbursements (table 5.1, line 10)                                       | .0       |
| 8.                | + Personal consumption expenditures, durable goods (table 1.1, line 3)                                | 252.7    |
| 9.                | + Surplus, social insurance funds (table 3.13, lines 11, 22)  | 6.1      |
| 10.               | + Government wage accruals less disbursements (table 3.2, line 30, and table 3.3, line 25)            | .0       |
| 11.               | + Statistical discrepancy (table 1.9, line 8)   | - .1     |
| 12.               | = Gross private national saving   | 815.8    |
| 13.               | + Human capital saving  | 4,568.6  |
| 14.               | = Full gross private national saving  | 5,384.4  |
| 15.               | - Depreciation  | 2,624.8  |
| 16.               | = Net private national saving   | 2,759.5  |
| 17.               | + Revaluation   | 10,643.0 |
| 18.               | = Change in private national wealth   | 13,402.5 |
| Capital Formation |   |          |
| 1.                | Gross private domestic investment (table 1.1, line 6)   | 447.3    |
| 2.                | + Personal consumption expenditures, durable goods (table 1.1, line 3)                                | 252.7    |
| 3.                | + Deficit of federal government (table 3.2, line 31)  | 145.9    |
| 4.                | + Deficit of state and local governments (table 3.3, line 26)   | - 35.1   |
| 5.                | - Deficit, federal social insurance funds (table 3.13, line 11)                                       | 30.8     |
| 6.                | - Deficit, state and local social insurance funds (table 3.13, line 22)                               | - 36.9   |
| 7.                | + Wage accruals less disbursement, federal government (table 3.2, line 30)                            | .0       |
| 8.                | + Wage accruals less disbursement, state and local government (table 3.3, line 25)                    | .0       |
| 9.                | + Net foreign investment (table 5.1, line 17)   | - 1.0    |
| 10.               | = Gross private national capital formation  | 815.8    |
| 11.               | + Gross private national human capital formation  | 4,568.6  |
| 12.               | = Full gross private national capital formation   | 5,384.4  |

*Note:* All table references are to the NIPA tables in the March 1986 *Survey of Current Business*.

net saving, and depreciation are given in current prices in table 5.27 and in constant prices in table 5.28. The share of net saving in gross saving has declined from 0.672 in 1964 to 0.503 in 1984. The share of depreciation has risen from 0.328 to 0.497 between these two years. The prices of net saving and depreciation are nearly proportional to each other so that the rise in the share of depreciation is due to a decline in net saving in constant prices from its peak level in 1971.

**Table 5.27 Full Gross Private National Saving (billions of current dollars)**

| Year | Full Gross Saving | Full Net Saving | Depreciation | Net Share | Depreciation Share |
|------|-------------------|-----------------|--------------|-----------|--------------------|
| 1949 | 483.8             | 306.9           | 176.8        | .634      | .366               |
| 1950 | 518.6             | 327.6           | 191.0        | .632      | .368               |
| 1951 | 566.4             | 358.8           | 207.6        | .634      | .366               |
| 1952 | 600.2             | 379.7           | 220.5        | .633      | .367               |
| 1953 | 660.7             | 421.9           | 238.8        | .639      | .361               |
| 1954 | 704.1             | 451.3           | 252.8        | .641      | .359               |
| 1955 | 745.2             | 480.6           | 264.5        | .645      | .355               |
| 1956 | 791.0             | 508.5           | 282.4        | .643      | .357               |
| 1957 | 873.5             | 571.0           | 302.5        | .654      | .346               |
| 1958 | 933.9             | 614.7           | 319.2        | .658      | .342               |
| 1959 | 971.9             | 640.8           | 331.1        | .659      | .341               |
| 1960 | 1,010.4           | 670.4           | 340.1        | .663      | .337               |
| 1961 | 1,081.2           | 720.2           | 361.0        | .666      | .334               |
| 1962 | 1,141.4           | 762.8           | 378.6        | .668      | .332               |
| 1963 | 1,185.3           | 791.7           | 393.6        | .668      | .332               |
| 1964 | 1,312.7           | 882.7           | 430.0        | .672      | .328               |
| 1965 | 1,384.0           | 923.4           | 460.6        | .667      | .333               |
| 1966 | 1,482.0           | 980.1           | 501.9        | .661      | .339               |
| 1967 | 1,580.8           | 1,037.4         | 543.4        | .656      | .344               |
| 1968 | 1,702.7           | 1,109.1         | 593.6        | .651      | .349               |
| 1969 | 1,827.9           | 1,184.5         | 643.4        | .648      | .352               |
| 1970 | 2,056.0           | 1,339.9         | 716.1        | .652      | .348               |
| 1971 | 2,327.6           | 1,526.0         | 801.6        | .656      | .344               |
| 1972 | 2,392.7           | 1,515.0         | 877.7        | .633      | .367               |
| 1973 | 2,553.2           | 1,585.0         | 968.2        | .621      | .379               |
| 1974 | 2,789.8           | 1,689.6         | 1,100.2      | .606      | .394               |
| 1975 | 3,163.1           | 1,910.2         | 1,252.9      | .604      | .396               |
| 1976 | 3,306.7           | 1,929.9         | 1,376.9      | .584      | .416               |
| 1977 | 3,593.1           | 2,072.2         | 1,520.9      | .577      | .423               |
| 1978 | 3,752.7           | 2,099.5         | 1,653.2      | .559      | .441               |
| 1979 | 4,236.1           | 2,338.4         | 1,897.7      | .552      | .448               |
| 1980 | 4,691.4           | 2,514.9         | 2,176.5      | .536      | .464               |
| 1981 | 5,102.5           | 2,700.7         | 2,401.8      | .529      | .471               |
| 1982 | 5,384.4           | 2,759.5         | 2,624.8      | .513      | .487               |
| 1983 | 5,739.7           | 2,911.5         | 2,828.3      | .507      | .493               |
| 1984 | 6,178.7           | 3,107.6         | 3,071.0      | .503      | .497               |



Table 5.28 Full Gross Private National Saving (billions of constant dollars)

| Year | Full Gross Saving |       | Full Net Saving |       | Full Depreciation |       |
|------|-------------------|-------|-----------------|-------|-------------------|-------|
|      | Quantity          | Price | Quantity        | Price | Quantity          | Price |
| 1949 | 2,864.6           | .169  | 1,815.2         | .169  | 1,073.1           | .165  |
| 1950 | 2,975.5           | .174  | 1,884.3         | .174  | 1,105.7           | .173  |
| 1951 | 3,044.2           | .186  | 1,932.8         | .186  | 1,136.3           | .183  |
| 1952 | 3,073.6           | .195  | 1,949.7         | .195  | 1,157.2           | .191  |
| 1953 | 3,155.3           | .209  | 2,017.4         | .209  | 1,174.0           | .203  |
| 1954 | 3,224.7           | .218  | 2,075.1         | .217  | 1,190.6           | .212  |
| 1955 | 3,373.1           | .221  | 2,206.4         | .218  | 1,202.7           | .220  |
| 1956 | 3,432.9           | .230  | 2,245.6         | .226  | 1,224.3           | .231  |
| 1957 | 3,537.5           | .247  | 2,339.4         | .244  | 1,241.5           | .244  |
| 1958 | 3,589.4           | .260  | 2,383.4         | .258  | 1,255.2           | .254  |
| 1959 | 3,691.4           | .263  | 2,460.7         | .261  | 1,266.3           | .261  |
| 1960 | 3,761.5           | .269  | 2,514.6         | .267  | 1,279.7           | .266  |
| 1961 | 3,873.2           | .279  | 2,602.0         | .277  | 1,305.0           | .277  |
| 1962 | 3,973.5           | .287  | 2,670.4         | .286  | 1,326.3           | .285  |
| 1963 | 4,091.4           | .290  | 2,752.8         | .288  | 1,353.2           | .291  |
| 1964 | 4,229.7           | .310  | 2,850.2         | .310  | 1,384.8           | .310  |
| 1965 | 4,297.4           | .322  | 2,869.1         | .322  | 1,423.9           | .323  |
| 1966 | 4,336.0           | .342  | 2,853.7         | .343  | 1,473.0           | .341  |
| 1967 | 4,402.6           | .359  | 2,866.5         | .362  | 1,526.8           | .356  |
| 1968 | 4,514.6           | .377  | 2,924.7         | .379  | 1,579.9           | .376  |
| 1969 | 4,654.4           | .393  | 3,011.4         | .393  | 1,634.4           | .394  |
| 1970 | 4,788.8           | .429  | 3,093.5         | .433  | 1,689.2           | .424  |
| 1971 | 4,963.3           | .469  | 3,210.0         | .475  | 1,746.4           | .459  |
| 1972 | 4,944.4           | .484  | 3,124.3         | .485  | 1,816.9           | .483  |
| 1973 | 5,002.8           | .510  | 3,116.9         | .508  | 1,893.3           | .511  |
| 1974 | 4,973.3           | .561  | 3,009.2         | .561  | 1,978.7           | .556  |
| 1975 | 5,019.1           | .630  | 2,977.0         | .642  | 2,056.3           | .609  |
| 1976 | 5,076.5           | .651  | 2,961.7         | .652  | 2,130.0           | .646  |
| 1977 | 5,215.8           | .689  | 3,017.7         | .687  | 2,212.1           | .688  |
| 1978 | 5,305.6           | .707  | 3,012.3         | .697  | 2,306.7           | .717  |
| 1979 | 5,350.3           | .792  | 2,950.5         | .793  | 2,407.0           | .788  |
| 1980 | 5,379.0           | .872  | 2,881.2         | .873  | 2,498.1           | .871  |
| 1981 | 5,430.0           | .940  | 2,869.7         | .941  | 2,560.4           | .938  |
| 1982 | 5,384.2           | 1.000 | 2,759.3         | 1.000 | 2,624.8           | 1.000 |
| 1983 | 5,428.7           | 1.057 | 2,743.4         | 1.061 | 2,686.0           | 1.053 |
| 1984 | 5,527.6           | 1.118 | 2,773.5         | 1.120 | 2,755.1           | 1.115 |

Depreciation in constant prices has grown steadily throughout the post-war period.

We have analyzed the structure of full gross private national saving in table 5.29. We present gross saving, net saving, and depreciation in current and constant prices. We also give saving and depreciation in constant prices per capita. The growth rate of net saving in constant prices per capita has been slightly negative for the period as a whole.

**Table 5.29 Full Gross Private National Saving, Rates of Growth, 1949–84**

|                              | 1949–84 | 1949–53 | 1953–57 | 1957–60 | 1960–66 | 1966–69 | 1969–73 | 1973–79 | 1979–84 |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Full gross saving:</b>    |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.28    | 7.79    | 6.98    | 4.85    | 6.38    | 6.99    | 8.35    | 8.44    | 7.55    |
| Constant prices              | 1.88    | 2.42    | 2.86    | 2.05    | 2.37    | 2.36    | 1.80    | 1.12    | .65     |
| Constant prices <sup>a</sup> | .58     | .75     | 1.09    | .24     | .92     | 1.26    | .84     | .28     | –.40    |
| Price index                  | 5.40    | 5.31    | 4.18    | 2.84    | 4.00    | 4.63    | 6.52    | 7.34    | 6.89    |
| <b>Full net saving:</b>      |         |         |         |         |         |         |         |         |         |
| Current prices               | 6.61    | 7.96    | 7.57    | 5.35    | 6.33    | 6.31    | 7.28    | 6.48    | 5.69    |
| Constant prices              | 1.21    | 2.64    | 3.70    | 2.41    | 2.11    | 1.79    | .86     | –.91    | –1.24   |
| Constant prices <sup>a</sup> | –.08    | .98     | 1.93    | .60     | .66     | .70     | –.11    | –1.76   | –2.28   |
| Price index                  | 5.40    | 5.31    | 3.87    | 3.00    | 4.17    | 4.54    | 6.42    | 7.42    | 6.91    |
| <b>Full depreciation:</b>    |         |         |         |         |         |         |         |         |         |
| Current prices               | 8.16    | 7.52    | 5.91    | 3.91    | 6.49    | 8.28    | 10.22   | 11.22   | 9.63    |
| Constant prices              | 2.69    | 2.25    | 1.40    | 1.01    | 2.34    | 3.47    | 3.68    | 4.00    | 2.70    |
| Constant prices <sup>a</sup> | 1.40    | .59     | –.37    | –.80    | .89     | 2.37    | 2.71    | 3.16    | 1.65    |
| Price index                  | 5.46    | 5.18    | 4.60    | 2.88    | 4.14    | 4.82    | 6.50    | 7.22    | 6.94    |

<sup>a</sup>This data calculated on a per capita basis.

This growth rate was positive for the periods 1948–53 through 1966–69 and has been negative ever since. The growth rate of gross saving in constant prices per capita was only 0.58 percent per year for the period as a whole and has been negative for the period 1979–84.

The final step in integrating our measures of saving with measures of human and nonhuman wealth is the estimate of revaluation of human and nonhuman capital for all years. We present estimates of saving, depreciation, net saving, revaluation, and change in wealth for the period 1948–84 in table 5.30. Revaluation rose to a peak in 1979 and has declined since then. Both revaluation and change in wealth fluctuate substantially from period to period, reflecting variations in the rate of change of lifetime labor incomes and asset values from period to period. Revaluation has exceeded net capital formation as a proportion of change in wealth in every year since 1963.

We conclude our presentation of a new system of national accounts for the United States with an account for the wealth of the private national sector of the U.S. economy. The value of full wealth is the sum of nonhuman wealth, as defined by Fraumeni and Jorgenson (1980), and our estimate of human wealth. We present estimates of full wealth, human wealth, and nonhuman wealth for the year 1982 in table 5.31. The share of human wealth dwarfs the share of nonhuman wealth. We present estimates of full wealth, human wealth, and nonhuman wealth for the period 1948–84 in current prices in table 5.32 and in constant prices in table 5.33. The share of human wealth in full wealth ranges from 0.943 in 1971 to 0.921 in 1981. The price of human wealth rises more rapidly than that of nonhuman wealth so that constancy of the human share is due to the slower growth of human wealth in constant prices.

We have analyzed the structure of full private national wealth for the U.S. economy in table 5.34. We present growth rates of full wealth, human wealth, and nonhuman wealth in current and constant prices and constant prices per capita for the period 1949–84. The growth rate of human wealth per capita in constant prices has been only 0.49 percent per year during the postwar period. By contrast, the growth rate of nonhuman wealth per capita in constant prices has averaged 1.65 percent per year. The behavior of full wealth closely parallels that of human wealth, which greatly predominates in the total.

Our final objective is to compare our estimates of human and nonhuman wealth with those of Kendrick (1976). We have defined human wealth in terms of lifetime labor incomes for all individuals in the U.S. population. We have also incorporated nonmarket activities into our measures of lifetime income. These two innovations result in important differences between our estimates and those of Kendrick. Kendrick, following the classic studies of Machlup (1962) and Schultz (1961),

**Table 5.30** Gross Private National Capital Accumulation (billions of current dollars)

| Year | Gross Private National Saving | Depreciation | Net Capital Formation | Revaluation | Change in Wealth |
|------|-------------------------------|--------------|-----------------------|-------------|------------------|
| 1949 | 483.8                         | 176.8        | 306.9                 | 729.5       | 1,036.5          |
| 1950 | 518.6                         | 191.0        | 327.6                 | 739.5       | 1,067.1          |
| 1951 | 566.4                         | 207.6        | 358.8                 | 941.2       | 1,300.0          |
| 1952 | 600.2                         | 220.5        | 379.7                 | 623.3       | 1,003.0          |
| 1953 | 660.7                         | 238.8        | 421.9                 | 1,400.4     | 1,822.3          |
| 1954 | 704.1                         | 252.8        | 451.3                 | 798.5       | 1,249.8          |
| 1955 | 745.2                         | 264.5        | 480.6                 | - 63.3      | 417.3            |
| 1956 | 791.0                         | 282.4        | 508.5                 | 927.5       | 1,436.1          |
| 1957 | 873.5                         | 302.5        | 571.0                 | 1,744.1     | 2,315.1          |
| 1958 | 933.9                         | 319.2        | 614.7                 | 1,783.9     | 2,398.6          |
| 1959 | 971.9                         | 331.1        | 640.8                 | - 128.3     | 512.5            |
| 1960 | 1,010.4                       | 340.1        | 670.4                 | 838.7       | 1,509.1          |
| 1961 | 1,081.2                       | 361.0        | 720.2                 | 1,291.4     | 2,011.6          |
| 1962 | 1,141.4                       | 378.6        | 762.8                 | 743.3       | 1,506.1          |
| 1963 | 1,185.3                       | 393.6        | 791.7                 | 378.1       | 1,169.9          |
| 1964 | 1,312.7                       | 430.0        | 882.7                 | 2,360.0     | 3,242.7          |
| 1965 | 1,384.0                       | 460.6        | 923.4                 | 2,202.2     | 3,125.6          |
| 1966 | 1,482.0                       | 501.9        | 980.1                 | 2,925.1     | 3,905.2          |
| 1967 | 1,580.8                       | 543.4        | 1,037.4               | 2,392.5     | 3,429.8          |
| 1968 | 1,702.7                       | 593.6        | 1,109.1               | 2,312.3     | 3,421.4          |
| 1969 | 1,827.9                       | 643.4        | 1,184.5               | 2,955.1     | 4,139.6          |
| 1970 | 2,056.0                       | 716.1        | 1,339.9               | 5,424.9     | 6,764.8          |
| 1971 | 2,327.6                       | 801.6        | 1,526.0               | 5,542.9     | 7,068.9          |
| 1972 | 2,392.7                       | 877.7        | 1,515.0               | 3,378.8     | 4,893.8          |
| 1973 | 2,553.2                       | 968.2        | 1,585.0               | 7,663.9     | 9,248.9          |
| 1974 | 2,789.8                       | 1,100.2      | 1,689.6               | 5,834.0     | 7,523.6          |
| 1975 | 3,163.1                       | 1,252.9      | 1,910.2               | 6,335.3     | 8,245.5          |
| 1976 | 3,306.7                       | 1,376.9      | 1,929.9               | 6,937.3     | 8,867.2          |
| 1977 | 3,593.1                       | 1,520.9      | 2,072.2               | 5,632.2     | 7,704.4          |
| 1978 | 3,752.7                       | 1,653.2      | 2,099.5               | 11,069.9    | 13,169.4         |
| 1979 | 4,236.1                       | 1,897.7      | 2,338.4               | 13,278.3    | 15,616.7         |
| 1980 | 4,691.4                       | 2,176.5      | 2,514.9               | 5,053.2     | 7,568.1          |
| 1981 | 5,102.5                       | 2,401.8      | 2,700.7               | 10,410.9    | 13,111.7         |
| 1982 | 5,384.4                       | 2,624.8      | 2,759.5               | 10,643.0    | 13,402.5         |
| 1983 | 5,739.7                       | 2,828.3      | 2,911.5               | 10,571.3    | 13,482.8         |
| 1984 | 6,178.7                       | 3,071.0      | 3,107.6               | 12,048.5    | 15,156.1         |

employs costs of education, including income forgone by students, as a basis for measuring investment in education. Similarly, he employs costs of rearing as a basis for measuring investment in human capital through the addition of new members of the population. His estimates do not include measures of the returns to investment in education or additions to the population.

**Table 5.31 Private National Wealth, 1982 (billions of current dollars)**

|    |  |         |           |
|----|--|---------|-----------|
| 1. | Private domestic tangible assets   |         | 12,791.8  |
| 2. | + Net claims on the federal, state, and local governments                |         | 896.2     |
|    | a. Federal, monetary   |         | 182.6     |
|    | i) + Vault cash of commercial banks <sup>a</sup>                         | 19.5    |           |
|    | ii) + Member bank reserves <sup>a</sup>                                  | 26.5    |           |
|    | iii) + Currency outside banks <sup>a</sup>                               | 136.6   |           |
|    | b. Federal, nonmonetary  |         | 644.1     |
|    | i) U.S. government total liabilities <sup>a</sup>                        | 1,133.9 |           |
|    | ii) – U.S. government financial assets <sup>a</sup>                      | 292.0   |           |
|    | iii) + Net liabilities, federally sponsored credit agencies <sup>a</sup> | – 5.9   |           |
|    | iv) + Assets of social insurance funds <sup>b</sup>                      | 65.7    |           |
|    | v) – U.S. government liabilities to the rest of world <sup>c</sup>       | 172.0   |           |
|    | vi) + U.S. government credits and claims abroad <sup>c</sup>             | 97.1    |           |
|    | vii) – Monetary liabilities  | 182.6   |           |
|    | c. State and local   |         | 69.4      |
|    | i) State and local government total liabilities <sup>a</sup>             | 315.8   |           |
|    | ii) – State and local government financial assets <sup>a</sup>           | 246.5   |           |
|    | iii) + Assets of cash sickness compensation fund (our imputation)        | .1      |           |
| 3. | + Net claims on the rest of world  |         | 199.9     |
|    | a. Private U.S. assets and investments abroad <sup>c</sup>               | 716.6   |           |
|    | b. – Private U.S. liabilities to foreigners <sup>c</sup>                 | 516.6   |           |
| 4. | = Private national nonhuman wealth                                       |         | 13,887.9  |
| 5. | + Private national human wealth  |         | 166,990.4 |
| 6. | = Full private national wealth   |         | 180,878.3 |

<sup>a</sup>Board of Governors of the Federal Reserve System, *Flow of Funds Accounts*, various issues.

<sup>b</sup>U.S. Department of the Treasury, *Treasury Bulletin*, February issues.

<sup>c</sup>“The International Investment Position of the United States,” *Survey of Current Business*, October issues.

In table 5.35, we present estimates of private national human wealth in current and constant prices from the present study and the study by Kendrick (1976). For comparability between the two studies, we have used the same year as a base for the price system as that employed by Kendrick, namely, 1958. Our estimates range from 14.64 to 16.67 times those of Kendrick in current prices and from 13.15 to 18.68 those of Kendrick in constant prices. It is important to note that Kendrick deflates his estimates on the basis of cost indexes for education and rearing of children, while our estimates are deflated by an index of lifetime incomes for all individuals in the U.S. population.

**Table 5.32 Full Private National Wealth (billions of current dollars)**

| Year | Full Wealth | Human Wealth | Nonhuman Wealth | Human Share | Nonhuman Share |
|------|-------------|--------------|-----------------|-------------|----------------|
| 1949 | 16,710.1    | 15,536.7     | 1,173.5         | .930        | .070           |
| 1950 | 17,777.2    | 16,512.9     | 1,264.3         | .929        | .071           |
| 1951 | 19,077.2    | 17,687.9     | 1,389.3         | .927        | .073           |
| 1952 | 20,080.2    | 18,618.4     | 1,461.8         | .927        | .073           |
| 1953 | 21,902.5    | 20,372.5     | 1,530.0         | .930        | .070           |
| 1954 | 23,152.3    | 21,574.4     | 1,577.9         | .932        | .068           |
| 1955 | 23,569.7    | 21,904.1     | 1,665.5         | .929        | .071           |
| 1956 | 25,005.7    | 23,209.8     | 1,795.9         | .928        | .072           |
| 1957 | 27,320.9    | 25,417.2     | 1,903.7         | .930        | .070           |
| 1958 | 29,719.4    | 27,737.3     | 1,982.2         | .933        | .067           |
| 1959 | 30,232.0    | 28,174.9     | 2,057.1         | .932        | .068           |
| 1960 | 31,741.0    | 29,603.6     | 2,137.4         | .933        | .067           |
| 1961 | 33,752.7    | 31,551.9     | 2,200.8         | .935        | .065           |
| 1962 | 35,258.8    | 32,971.7     | 2,287.1         | .935        | .065           |
| 1963 | 36,428.7    | 34,056.3     | 2,372.4         | .935        | .065           |
| 1964 | 39,671.4    | 37,187.6     | 2,483.8         | .937        | .063           |
| 1965 | 42,797.0    | 40,171.4     | 2,625.6         | .939        | .061           |
| 1966 | 46,702.1    | 43,886.3     | 2,815.8         | .940        | .060           |
| 1967 | 50,132.0    | 47,137.4     | 2,994.6         | .940        | .060           |
| 1968 | 53,553.4    | 50,331.7     | 3,221.7         | .940        | .060           |
| 1969 | 57,693.0    | 54,184.1     | 3,508.9         | .939        | .061           |
| 1970 | 64,457.8    | 60,722.1     | 3,735.7         | .942        | .058           |
| 1971 | 71,526.6    | 67,478.3     | 4,048.3         | .943        | .057           |
| 1972 | 76,420.4    | 71,999.6     | 4,420.8         | .942        | .058           |
| 1973 | 85,669.3    | 80,686.5     | 4,982.7         | .942        | .058           |
| 1974 | 93,192.9    | 87,523.0     | 5,669.9         | .939        | .061           |
| 1975 | 101,438.4   | 95,046.5     | 6,391.9         | .937        | .063           |
| 1976 | 110,305.6   | 103,214.4    | 7,091.2         | .936        | .064           |
| 1977 | 118,010.0   | 110,041.7    | 7,968.2         | .932        | .068           |
| 1978 | 131,179.4   | 122,024.2    | 9,155.2         | .930        | .070           |
| 1979 | 146,796.0   | 136,287.5    | 10,508.5        | .928        | .072           |
| 1980 | 154,364.1   | 142,516.4    | 11,847.7        | .923        | .077           |
| 1981 | 167,475.8   | 154,259.9    | 13,215.9        | .921        | .079           |
| 1982 | 180,878.3   | 166,990.4    | 13,887.9        | .923        | .077           |
| 1983 | 194,361.1   | 179,555.3    | 14,805.8        | .924        | .076           |
| 1984 | 209,517.2   | 193,829.2    | 15,688.0        | .925        | .075           |

Our estimates of nonhuman wealth are based on those of Jorgenson and Fraumeni (1980). In table 5.36, we compare our estimates with those of Kendrick in current and constant prices, using 1958 as the base year for the price system. Our estimates are a fairly constant proportion of Kendrick's, amounting to about twice the level of Kendrick's estimates. In table 5.37, we present a comparison of our estimates of full wealth and those of Kendrick in current and constant prices. Since full wealth is dominated by human wealth, we find that our estimates greatly exceed those of Kendrick in both current and constant prices.

Table 5.33 Full Private National Wealth (billions of constant dollars)

| Year | Full Wealth |       | Human Wealth |       | Nonhuman Wealth |       |
|------|-------------|-------|--------------|-------|-----------------|-------|
|      | Quantity    | Price | Quantity     | Price | Quantity        | Price |
| 1949 | 96,884.8    | .172  | 91,689.0     | .169  | 5,213.6         | .225  |
| 1950 | 98,785.0    | .180  | 93,314.3     | .177  | 5,446.9         | .232  |
| 1951 | 100,730.0   | .189  | 95,024.7     | .186  | 5,650.5         | .246  |
| 1952 | 102,664.9   | .196  | 96,789.4     | .192  | 5,805.2         | .252  |
| 1953 | 104,650.1   | .209  | 98,603.6     | .207  | 5,962.4         | .257  |
| 1954 | 106,679.5   | .217  | 100,472.2    | .215  | 6,113.7         | .258  |
| 1955 | 108,896.9   | .216  | 102,441.8    | .214  | 6,338.5         | .263  |
| 1956 | 111,142.0   | .225  | 104,468.7    | .222  | 6,538.3         | .275  |
| 1957 | 113,477.8   | .241  | 106,624.7    | .238  | 6,708.3         | .284  |
| 1958 | 115,805.9   | .257  | 108,833.5    | .255  | 6,827.6         | .290  |
| 1959 | 118,302.2   | .256  | 111,134.8    | .254  | 7,013.7         | .293  |
| 1960 | 120,844.0   | .263  | 113,506.4    | .261  | 7,178.5         | .298  |
| 1961 | 123,408.8   | .274  | 115,910.1    | .272  | 7,335.6         | .300  |
| 1962 | 126,098.6   | .280  | 118,390.3    | .278  | 7,537.6         | .303  |
| 1963 | 128,874.3   | .283  | 120,934.3    | .282  | 7,760.7         | .306  |
| 1964 | 131,693.1   | .301  | 123,489.4    | .301  | 8,015.5         | .310  |
| 1965 | 134,505.5   | .318  | 125,992.3    | .319  | 8,319.8         | .316  |
| 1966 | 137,273.7   | .340  | 128,423.9    | .342  | 8,657.3         | .325  |
| 1967 | 140,060.0   | .358  | 130,911.8    | .360  | 8,959.3         | .334  |
| 1968 | 142,922.6   | .375  | 133,470.4    | .377  | 9,269.0         | .348  |
| 1969 | 145,801.8   | .396  | 136,048.7    | .398  | 9,575.7         | .366  |
| 1970 | 148,666.3   | .434  | 138,650.8    | .438  | 9,843.1         | .380  |
| 1971 | 151,669.2   | .472  | 141,342.5    | .477  | 10,170.0        | .398  |
| 1972 | 154,569.2   | .494  | 143,901.4    | .500  | 10,536.2        | .420  |
| 1973 | 157,173.3   | .545  | 146,113.0    | .552  | 10,970.0        | .454  |
| 1974 | 159,869.7   | .583  | 148,492.6    | .589  | 11,310.0        | .501  |
| 1975 | 162,721.7   | .623  | 151,071.3    | .629  | 11,593.2        | .551  |
| 1976 | 165,344.2   | .667  | 153,376.0    | .673  | 11,927.8        | .595  |
| 1977 | 168,111.2   | .702  | 155,791.4    | .706  | 12,295.5        | .648  |
| 1978 | 170,556.4   | .769  | 157,858.0    | .773  | 12,689.8        | .721  |
| 1979 | 173,039.8   | .848  | 159,991.9    | .852  | 13,049.7        | .805  |
| 1980 | 175,753.0   | .878  | 162,424.8    | .877  | 13,331.7        | .889  |
| 1981 | 178,384.4   | .939  | 164,751.3    | .936  | 13,634.3        | .969  |
| 1982 | 180,878.3   | 1.000 | 166,990.4    | 1.000 | 13,887.9        | 1.000 |
| 1983 | 183,323.4   | 1.060 | 169,120.6    | 1.062 | 14,204.0        | 1.042 |
| 1984 | 185,734.0   | 1.128 | 171,121.4    | 1.133 | 14,622.0        | 1.073 |

## 5.6 Conclusion

In this paper, we have presented a new system of national accounts for the United States, based on comparable measures of investment in human and nonhuman capital. Our accounting system incorporates four major innovations. First, we have defined human capital in terms of lifetime labor income for all individuals in the U.S. population. Second, we have integrated demographic accounts for the U.S. population with

**Table 5.34 Full Private National Wealth, Rates of Growth, 1949–84**

|                              | 1949–84 | 1949–53 | 1953–57 | 1957–60 | 1960–66 | 1966–69 | 1969–73 | 1973–79 | 1979–84 |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Full wealth:</b>          |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.23    | 6.76    | 5.53    | 5.00    | 6.44    | 7.04    | 9.88    | 8.98    | 7.12    |
| Constant prices              | 1.86    | 1.93    | 2.02    | 2.10    | 2.12    | 2.01    | 1.88    | 1.60    | 1.42    |
| Constant prices <sup>a</sup> | .56     | .27     | .25     | .29     | .67     | .91     | .91     | .76     | .37     |
| Price index                  | 5.37    | 4.87    | 3.56    | 2.91    | 4.28    | 5.08    | 7.98    | 7.37    | 5.71    |
| <b>Human wealth:</b>         |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.21    | 6.77    | 5.53    | 5.08    | 6.56    | 7.03    | 9.95    | 8.74    | 7.04    |
| Constant prices              | 1.78    | 1.82    | 1.96    | 2.08    | 2.06    | 1.92    | 1.78    | 1.51    | 1.35    |
| Constant prices <sup>a</sup> | .49     | .16     | .18     | .28     | .61     | .82     | .82     | .67     | .30     |
| Price index                  | 5.44    | 5.07    | 3.49    | 3.07    | 4.50    | 5.05    | 8.18    | 7.23    | 5.70    |
| <b>Nonhuman wealth:</b>      |         |         |         |         |         |         |         |         |         |
| Current prices               | 7.41    | 6.63    | 5.46    | 3.86    | 4.59    | 7.34    | 8.77    | 12.44   | 8.01    |
| Constant prices              | 2.95    | 3.36    | 2.95    | 2.26    | 3.12    | 3.36    | 3.40    | 2.89    | 2.28    |
| Constant prices <sup>a</sup> | 1.65    | 1.69    | 1.18    | .45     | 1.67    | 2.26    | 2.43    | 2.05    | 1.23    |
| Price index                  | 4.46    | 3.32    | 2.50    | 1.60    | 1.45    | 3.96    | 5.39    | 9.55    | 5.75    |

<sup>a</sup>This data calculated on a per capita basis.



**Table 5.35 Private National Human Wealth, 1949–69**

| Year | Billions of Current Dollars  |          |       | Billions of 1958 Dollars     |          |       |
|------|------------------------------|----------|-------|------------------------------|----------|-------|
|      | Jorgenson<br>and<br>Fraumeni | Kendrick | Ratio | Jorgenson<br>and<br>Fraumeni | Kendrick | Ratio |
| 1949 | 15,536.7                     | 938.9    | 16.55 | 23,214.7                     | 1,242.9  | 18.68 |
| 1950 | 16,512.9                     | 991.3    | 16.66 | 23,576.8                     | 1,280.5  | 18.41 |
| 1951 | 17,687.9                     | 1,097.7  | 16.11 | 24,051.8                     | 1,322.2  | 18.19 |
| 1952 | 18,618.4                     | 1,172.6  | 15.88 | 24,412.9                     | 1,366.9  | 17.86 |
| 1953 | 20,372.5                     | 1,236.8  | 16.47 | 25,051.4                     | 1,413.3  | 17.73 |
| 1954 | 21,574.4                     | 1,294.4  | 16.67 | 25,551.2                     | 1,460.0  | 17.50 |
| 1955 | 21,904.1                     | 1,364.2  | 16.06 | 26,061.8                     | 1,509.9  | 17.26 |
| 1956 | 23,209.8                     | 1,462.7  | 15.87 | 26,510.7                     | 1,565.6  | 16.93 |
| 1957 | 25,417.2                     | 1,576.8  | 16.12 | 27,104.6                     | 1,623.7  | 16.69 |
| 1958 | 27,737.3                     | 1,682.6  | 16.48 | 27,737.3                     | 1,682.6  | 16.48 |
| 1959 | 28,174.9                     | 1,786.9  | 15.77 | 28,285.0                     | 1,744.7  | 16.21 |
| 1960 | 29,603.6                     | 1,901.4  | 15.57 | 28,928.2                     | 1,615.1  | 17.91 |
| 1961 | 31,551.9                     | 2,012.8  | 15.68 | 29,594.3                     | 1,888.4  | 15.67 |
| 1962 | 32,971.7                     | 2,137.4  | 15.43 | 30,263.3                     | 1,962.5  | 15.42 |
| 1963 | 34,056.3                     | 2,273.0  | 14.98 | 30,927.5                     | 2,041.9  | 15.15 |
| 1964 | 37,187.6                     | 2,423.9  | 15.34 | 31,751.5                     | 2,126.8  | 14.93 |
| 1965 | 40,171.4                     | 2,594.4  | 15.48 | 32,465.6                     | 2,218.8  | 14.63 |
| 1966 | 43,886.3                     | 2,818.7  | 15.57 | 33,172.9                     | 2,323.4  | 14.28 |
| 1967 | 47,137.4                     | 3,049.7  | 15.46 | 33,838.9                     | 2,434.0  | 13.90 |
| 1968 | 50,331.7                     | 3,344.4  | 15.05 | 34,494.0                     | 2,550.1  | 13.53 |
| 1969 | 54,184.1                     | 3,699.9  | 14.64 | 35,164.9                     | 2,674.4  | 13.15 |

economic accounts for the private sector of the U.S. economy. Third, we have incorporated the value of nonmarket activities in our measures of labor incomes and human capital. Fourth, we have measured the services of both human and nonhuman capital in a comparable way.

To implement our system of accounts for the United States, we have constructed a new data base for measuring lifetime labor incomes for all individuals in the U.S. population. Our data base includes demographic accounts in each year for the population by each sex, cross-classified by individual years of age and individual years of educational attainment. Our demographic accounts include data on the number of individuals enrolled in formal schooling and births, deaths, and migration. These accounts are based on annual population data from the U.S. Bureau of the Census. We have incorporated data from the decennial census of population to obtain estimates of the population cross-classified by sex, age, and education.

To measure lifetime labor incomes for all individuals in the U.S. population, we begin with the data base on market labor activities assembled by Gollop and Jorgenson (1980, 1983). We have derived estimates of hours worked and labor compensation for each sex by

**Table 5.36 Private National Nonhuman Wealth, 1949–69**

| Year | Billions of Current Dollars  |          |       | Billions of 1958 Dollars     |          |       |
|------|------------------------------|----------|-------|------------------------------|----------|-------|
|      | Jorgenson<br>and<br>Fraumeni | Kendrick | Ratio | Jorgenson<br>and<br>Fraumeni | Kendrick | Ratio |
| 1949 | 1,173.5                      | 571.1    | 2.05  | 1,512.5                      | 717.6    | 2.11  |
| 1950 | 1,264.3                      | 621.4    | 2.03  | 1,580.4                      | 750.1    | 2.11  |
| 1951 | 1,389.3                      | 711.3    | 1.95  | 1,637.8                      | 789.6    | 2.07  |
| 1952 | 1,461.8                      | 749.1    | 1.95  | 1,682.2                      | 819.6    | 2.05  |
| 1953 | 1,530.0                      | 771.4    | 1.98  | 1,726.5                      | 844.5    | 2.04  |
| 1954 | 1,577.9                      | 782.2    | 2.02  | 1,773.6                      | 868.3    | 2.04  |
| 1955 | 1,665.5                      | 827.2    | 2.01  | 1,836.5                      | 899.8    | 2.04  |
| 1956 | 1,795.9                      | 898.1    | 2.00  | 1,893.9                      | 938.6    | 2.02  |
| 1957 | 1,903.7                      | 958.2    | 1.99  | 1,943.9                      | 971.3    | 2.00  |
| 1958 | 1,982.2                      | 989.7    | 2.00  | 1,982.2                      | 989.7    | 2.00  |
| 1959 | 2,057.1                      | 1,031.4  | 1.99  | 2,036.0                      | 1,005.9  | 2.02  |
| 1960 | 2,137.4                      | 1,057.6  | 2.02  | 2,080.0                      | 1,030.4  | 2.02  |
| 1961 | 2,200.8                      | 1,077.7  | 2.04  | 2,127.4                      | 1,049.4  | 2.03  |
| 1962 | 2,287.1                      | 1,115.6  | 2.05  | 2,189.0                      | 1,072.2  | 2.04  |
| 1963 | 2,372.4                      | 1,164.3  | 2.04  | 2,248.4                      | 1,102.8  | 2.04  |
| 1964 | 2,483.8                      | 1,222.6  | 2.03  | 2,323.6                      | 1,138.2  | 2.04  |
| 1965 | 2,625.6                      | 1,292.4  | 2.03  | 2,409.6                      | 1,183.5  | 2.04  |
| 1966 | 2,815.8                      | 1,383.4  | 2.04  | 2,512.6                      | 1,235.0  | 2.03  |
| 1967 | 2,994.6                      | 1,475.5  | 2.03  | 2,600.1                      | 1,274.6  | 2.04  |
| 1968 | 3,221.7                      | 1,549.7  | 2.08  | 2,684.8                      | 1,300.8  | 2.06  |
| 1969 | 3,508.9                      | 1,644.1  | 2.13  | 2,780.3                      | 1,332.4  | 2.09  |

sixty-one age groups and eighteen education groups for a total of 2,196 groups for each year. We impute wage rates for nonmarket activities from wage rates for employed individuals. We allocate the total time endowment for all individuals in the population among work, schooling, household production and leisure, and maintenance. We exclude maintenance through the satisfaction of physiological needs from our accounts for lifetime labor incomes. We assign the value of time spent in household production and leisure to consumption and time spent in schooling to investment.

Our final step in measuring lifetime labor incomes for all individuals in the U.S. population is to project incomes for future years and to discount incomes for all future years back to the present, weighting income by the probability of survival. We combine estimates of lifetime labor incomes by sex, age, and education with demographic accounts for the numbers of individuals to obtain estimates of human wealth, investment in human capital, and human capital services. We have presented these estimates in current prices for the period 1948–84 for all individuals in the U.S. population. Combining these estimates with measures of nonhuman capital services by Fraumeni and Jorgenson

Table 5.37 Full Private National Wealth, 1949-69

| Year | Billions of Current Dollars  |          |       | Billions of 1958 Dollars     |          |       |
|------|------------------------------|----------|-------|------------------------------|----------|-------|
|      | Jorgenson<br>and<br>Fraumeni | Kendrick | Ratio | Jorgenson<br>and<br>Fraumeni | Kendrick | Ratio |
| 1949 | 16,710.1                     | 1,510.0  | 11.07 | 24,968.0                     | 1,960.5  | 12.74 |
| 1950 | 17,777.2                     | 1,612.7  | 11.02 | 25,381.9                     | 2,030.8  | 12.50 |
| 1951 | 19,077.2                     | 1,809.0  | 10.55 | 25,941.0                     | 2,111.8  | 12.28 |
| 1952 | 20,080.2                     | 1,921.7  | 10.45 | 26,329.6                     | 2,186.5  | 12.04 |
| 1953 | 21,902.5                     | 2,008.2  | 10.91 | 26,932.7                     | 2,257.8  | 11.93 |
| 1954 | 23,152.3                     | 2,076.6  | 11.15 | 27,420.0                     | 2,328.3  | 11.78 |
| 1955 | 23,569.7                     | 2,191.4  | 10.76 | 28,043.6                     | 2,409.7  | 11.64 |
| 1956 | 25,005.7                     | 2,360.8  | 10.59 | 28,562.1                     | 2,504.2  | 11.41 |
| 1957 | 27,320.9                     | 2,535.0  | 10.78 | 29,134.7                     | 2,595.0  | 11.23 |
| 1958 | 29,719.4                     | 2,672.3  | 11.12 | 29,719.4                     | 2,672.3  | 11.12 |
| 1959 | 30,232.0                     | 2,818.3  | 10.73 | 30,350.1                     | 2,750.6  | 11.03 |
| 1960 | 31,741.0                     | 2,959.0  | 10.73 | 31,016.9                     | 2,845.5  | 10.90 |
| 1961 | 33,752.7                     | 3,090.5  | 10.92 | 31,658.6                     | 2,937.8  | 10.78 |
| 1962 | 35,258.8                     | 3,253.0  | 10.84 | 32,362.5                     | 3,034.7  | 10.66 |
| 1963 | 36,428.7                     | 3,437.3  | 10.60 | 33,081.9                     | 3,144.7  | 10.52 |
| 1964 | 39,671.4                     | 3,646.5  | 10.88 | 33,872.3                     | 3,265.0  | 10.37 |
| 1965 | 42,797.0                     | 3,886.8  | 11.01 | 34,587.5                     | 3,402.3  | 10.17 |
| 1966 | 46,702.1                     | 4,202.1  | 11.11 | 35,301.3                     | 3,558.4  | 9.92  |
| 1967 | 50,132.0                     | 4,525.2  | 11.08 | 35,988.6                     | 3,708.6  | 9.70  |
| 1968 | 53,553.4                     | 4,894.1  | 10.94 | 36,701.9                     | 3,850.9  | 9.53  |
| 1969 | 57,693.0                     | 5,344.0  | 10.80 | 37,442.2                     | 4,006.8  | 9.34  |

(1980, 1986), we obtain a complete system of national accounts for the United States.

Our new system of U.S. national accounts results in a dramatic change in perspective on the role of wealth, investment, and capital services in economic activity. We have employed the resulting system of accounts to describe economic growth by means of a production account, the allocation of income between consumption and saving by means of an income and expenditure account, and the accumulation of wealth by means of accumulation and wealth accounts. Even as an accounting exercise, our results have important limitations. Perhaps the most significant is the exclusion of the government sector, including public education, from the production account. This is an important gap that we hope to fill.<sup>8</sup>

Our system of accounts could be extended in the direction of a measure of economic welfare, taking the concept of consumption employed in our income and expenditure account as a point of departure. Our concept includes consumption of nonmarket goods and services, including household production and the enjoyment of leisure, as well as market goods and services. This concept of consumption could be augmented by consumption provided by the business sector, but not

included in our expenditure account, and diminished by work-related outlays that are included in our account. Our concept could also be increased by government services, excluding instrumental or defensive outlays. Finally, additional imputations could be made for amenities and disamenities associated with changes in the social and physical environment.<sup>9</sup>

Another task that remains is to employ the new accounting framework in exploring the determinants of saving and wealth, including human and nonhuman capital. The production account could be modeled by means of a production function, giving output as a function of inputs of human and nonhuman capital services. The income and expenditure account could be modeled by means of a model of household behavior, generating income from the supply of human and nonhuman capital services, and allocating this income between consumption and saving. Current consumption would enter into an intertemporal utility function that also includes future consumption. Finally, the accumulation and wealth accounts could be modeled by means of a model of portfolio choice.

## Notes

1. See, e.g., Gorman et al. (1985) and Bureau of Economic Analysis (1976).
2. Estimates of lifetime labor incomes for men based on market labor activities have been presented in Weisbrod (1961), Miller (1965), Miller and Hornseth (1967), Bureau of the Census (1968, 1974), and Graham and Webb (1979).
3. Demographic accounting is discussed in detail in Stone (1971) and United Nations (1975). This approach and its relation to economic accounts are reviewed by Stone (1981). A system of demographic accounts has been implemented for the United States by McMillen and Land (1980) and by McMillen (1980). The results of this research are reviewed by Land and McMillen (1981).
4. An economic theory of time allocation is presented by Becker (1965). Detailed references to more recent literature on time allocation are given by Murphy (1980). Results of a comprehensive and recent empirical study for the United States are presented by Juster et al. (1978). Kendrick (1979) summarizes the results of an unpublished paper by Wehle (1979), comparing seventeen studies of time allocation for the United States, covering the period 1924–76.
5. Nineteen empirical studies of the valuation of nonmarket labor activities for the United States are surveyed by Murphy (1980). Kendrick (1979) provides recent estimates covering the period 1929–73. An excellent summary of current research on demographic and time use accounting is provided by a recent volume edited by Juster and Land (1981a). Overviews of research in both areas are provided by House (1981), Juster and Land (1981b), and Ruggles (1981), all of which appear in Juster and Land (1981a). Time use accounting has been discussed by Fox and Ghosh (1981), Juster, Courant, and Dow (1981a, 1981b), and Terleckj (1981). Gates and Murphy (1982) presented detailed time use accounts for the United States for 1975–76 based on data collected by the Survey Research Center of the University of Michigan.

6. A system of vintage accounts for nonhuman capital is presented by Jorgenson (1980). This system of accounts has been implemented for the U.S. economy by Fraumeni and Jorgenson (1980). A preliminary form of vintage accounts for human and nonhuman capital has been presented by Jorgenson and Pachon (1983a, 1983b). Additional details are provided by Christensen and Jorgenson (1969, 1970, 1973a, 1973b). Campbell and Peskin (1979) have summarized accounting systems developed by Kendrick (1976, 1979), Ruggles and Ruggles (1970, 1973), and Eisner (1978, 1980). Kendrick's accounting system is similar in scope to our own since it includes production, income and expenditure, accumulation, and wealth accounts. Kendrick's accounting system is also discussed by Engerman and Rosen (1980). Further references to the literature are given by Campbell and Peskin (1979). Ruggles and Ruggles (1982) have recently presented a system of integrated economic accounts for the United States that combines income and product accounts, flow-of-funds accounts, and balance sheets for nonhuman capital.

7. Kendrick's estimates of human capital have been compared with estimates based on lifetime labor incomes for males between the ages of fourteen and seventy-four for the United States, excluding the value of nonmarket activities, for the year 1969 by Graham and Webb (1979). A very detailed survey of nonmarket labor time and its value has been presented by Murphy (1980). Murphy (1982) provides detailed estimates of the value of household work in the United States for 1976.

8. A complete account for the educational sector is needed to estimate rates of return to educational investment. Estimates of investment in education have been presented by Schultz (1961). Rates of return are given by Becker (1975). Kendrick (1976) provides estimates covering the period 1929–69. Detailed references to recent literature are provided by Campbell and Peskin (1979). Gates (1982) provides time-series estimates of education and training costs for 1965–79.

9. Welfare measures of aggregate economic activity for the United States have been presented by Sametz (1968) and Nordhaus and Tobin (1972). Proposals for measuring welfare have been reviewed by Campbell and Peskin (1979), United Nations (1977), and Beckerman (1978). Measurement of environmental amenities and disamenities is discussed by Cremeans (1977) and by Peskin and Peskin (1978). Detailed references to the literature are given by Campbell and Peskin (1979).

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## Comment      Sherwin Rosen

This pioneering paper is one of the most comprehensive studies ever undertaken for imputing values of human capital investment and of nonmarket production in national income and product accounts. A project of this scope and importance will be studied, discussed, and refined for many years. My comments are focused on a few points to help get the professional dialogue started.

The imputations for nonmarket production are based on the concept of full income familiar from time allocation theory, under which it is maintained that a person can work as much or as little as desired at a fixed hourly wage rate. The proper shadow price for nonmarket time is the (after-tax) alternative *marginal* market value of a unit of time, assumed here to equal the average hourly wage rate. However, most workers are restricted in their choices of hours on existing jobs. Most jobs offer all-or-nothing fixed hours–wage packages, and a change in hours must be implemented by changing jobs. Since the market equilibrium wage-hours locus is probably nonlinear, the average hourly wage rate does not necessarily equal the marginal product of an additional hour of market work required for the imputation. This point is important because the imputed value of nonmarket time is much larger than the value of market time.

Sherwin Rosen is a professor of economics at the University of Chicago and a research associate of the National Bureau of Economic Research.

Most direct studies (e.g., commuting time) suggest that the value of time is significantly smaller than the (after-tax) wage rate. Moreover, the choice of working hours depends on how a person's productivity varies over the time unit. At the optimal choice, the marginal product of an additional work hour is less than or equal to its marginal disutility. This leads to well-known selectivity biases for people who do not work at all. For people who work substantial amounts, the solution probably lies in the region where average productivity is falling and the marginal product is less than the average. Exceptions occur when either fixed costs of market participation or increasing returns to additional work hours in market production are large, but these are unlikely to dominate the data. We do not know enough about this problem to quantify the bias, and the authors can hardly be faulted for that state of affairs. Nonetheless, these qualifications should be kept in mind in interpreting their numbers. It also would be useful to present estimates of the value of nonmarket production by sex because of the enormous changes in fertility and labor-force behavior of women over the period studied. Labor economists think that the most important component of non-market production is the value of housewives' time associated with the rearing of children. It would be interesting to know if the imputations are consistent with this point.

The estimates of human capital investment rival the magnitude of conventional gross domestic product (their table 5.1). To put Jorgenson and Fraumeni's numbers in perspective, consider that there were about 93 million persons aged zero to twenty-five in the population who were eligible for human capital investment as they define it. Then their 1982 estimate amounts to a very large sum of \$25,000 worth of investment for each of these people in that year, and this is a lower bound because many of them were not enrolled in school. These numbers are much larger than either Kendrick's (1976) cost-based estimates or Mincer's (1962) internal-rate-of-return estimates. One reason for the difference is that Jorgenson and Fraumeni's estimates include the value of *both* market and nonmarket time. Kendrick and Mincer did not value non-market time, which is more than half the total because it includes such things as weekends and holidays. Market time accounts for about three-eighths of total time in Jorgenson and Fraumeni's table 5.2 calculations, so a more conventional market value estimate would reduce the \$2.36 trillion total to \$.9 trillion in 1982, still a substantial sum of about \$9,500 in that year for each person aged zero to twenty-five in the population. This raises a question related to the first point. Should all nonmarket time be imputed to human capital investment? How is it that investments in specialized market skills affect the productivity of such non-market activities as watching television or reading the newspaper?

These questions have been raised before but are not yet answered in the literature.

Another reason for the large size of the human investment estimates is that they are based on gross discounted full incomes in the zero to twenty-five age groups. The actual procedure is more complicated, but the following artificial example illustrates how it works. Suppose everyone were alike, stayed in school exactly sixteen years, and did not work at all while in school. At age twenty-one, the representative person graduates and enters the labor market, earning, say, a flat \$30,000 per year thereafter. This is increased to \$80,000 per year by the non-market time value imputation and amounts to about \$2 million in present discounted value at age twenty-one using a 4 percent discount rate and ignoring mortality. In this example, investment equals the number of people graduating from grade 16 in a given year times \$2 million. The actual method includes births, immigration, and mortality, and it spreads personal investment over the whole schooling period rather than concentrating it on a single age, but the example illustrates the logic. These estimates are gross of the costs of investment: neither the costs of maintenance during working life nor the considerable time and money costs of raising children (including accumulated interest) are considered. Similarly, the human wealth figures in Jorgenson and Fraumeni's table 5.32 are gross discounted lifetime full earnings summed across the entire U.S. population. If costs were netted out, as they are for physical capital, both investment and stock estimates would be much smaller. I hope the authors subsequently will clarify the questions these imputations are supposed to answer.

The revaluation estimates in their table 5.30 are very large (e.g., the 1982 figure exceeds conventional gross national product by a factor of three), and they show substantial variability. The computational algorithms for this and the other price indexes are not presented in enough detail to clarify these sources of variation, yet age-earnings profiles on which they rest are fairly stable over both time and place. The most important variation for human capital valuation is the intercept, not the slope of the profile, and the four censuses of 1950–80 provide a basis for a smooth year-to-year interpolation. The revaluation estimates would show much less variation had it been done in this way. Finally, the depreciation estimates in Jorgenson and Fraumeni's tables 5.27 and 5.28 seem to include gross on-the-job investment as one of its components. It would be of substantial interest to present those estimates separately.

In conclusion, it is worth emphasizing that these comments do not detract from the conceptual and practical importance of this paper. Jorgenson and Fraumeni have done a great service in proving the im-

portance of human capital and nonmarket production for national income accounting. Their estimates will stand as a benchmark and make it difficult for economists to ignore these issues from now on.

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