- Looks only at the corporate sector (excludes housing sector)
- Uses a 2 sectors framework (price of output different from price of K)
- Looks carefully at after tax returns

- Compares returns from bonds and stock indices to national accounts returns, finds national accounts returns somewhat lower

The rate of return to corporate capital and factor shares: new estimates using revised national income accounts and capital stock data

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Abstract

This paper presents new evidence on the rate of return on tangible assets in the United States, incorporating the recently-revised national accounts as well as new estimates of the replacement cost of the reproducible physical capital stock. The pretax return on capital in the nonfinancial corporate sector has averaged 8.5 percent over the 1959-1996 period. The paper also presents new estimates of the total tax burden on nonfinancial corporate capital, which averages 54.1 percent over this time period. For the 1990s, this tax rate, which includes corporate income taxes, corporate property taxes, and taxes on stock- and bond-holders, averages 42.1 percent of pretax profits. The average pretax rate of return for the 1990-1996 period is 8.6 percent, and the average after-tax return is 5.0 percent. Although the accounting

return to corporate capital has been higher in the mid-1990s than at any previous point in the last two decades, the substantial volatility in the return series makes it premature to conclude that these years represent a departure from past experience.

The rate of return to capital is a central parameter in evaluating a range of economic policies that may affect capital formation. The welfare cost of policies that discourage capital accumulation depends on whether the prevailing rate of return is above or below the effective rate of labor-force growth, the "golden-rule" level derived by Phelps (1961) and Diamond (1965). Although policy discussions, particularly in the area of tax policy, frequently involve debate over policies that might affect the rate of capital accumulation, Summers (1990) notes that there is substantial conceptual and empirical disagreement about the return to expanding the physical capital stock.

One method of estimating the return to capital accumulation uses national income accounts data to calculate the average accounting rate of return on tangible assets. These estimates of the rate of return are not without their limitations, notably the potential divergence between marginal and average returns, but they are widely used. Feldstein (1977) invokes such a return measure in his analysis of the welfare gain from higher national saving. Abel, Mankiw, Summers, and Zeckhauser (1989) develop a generalization of the golden rule that focuses on such a return divided by the capital-output ratio. Feldstein (1996) relies on similar return measures to estimate the welfare gains from the capital accumulation that would flow from a fully-funded Social Security system in the United States.

Recent data releases from the Bureau of Economic Analysis (BEA) provide a warrant for developing new estimates of the rate of return on tangible assets. One of the central features of the revision of the United States' National Income and Product Accounts (NIPA) that was completed in January 1997 was updating the algorithm that is used to calculate depreciation on physical assets. This revision, described in detail by Fraumeni (1997) and Katz and Herman (1997), has generated a new set of estimates for the current- and constant-dollar stocks of reproducible physical capital over the 1929-1995 period. The assumed rates of asset decay in the revised national accounts are generally lower than those in the previous set of accounts, so the revision has increased the estimated stock of physical assets. Changes in the depreciation assumptions underlying the NIPA have also resulted in revised estimates of corporate profits net of true economic depreciation on tangible assets.

This paper uses the newly-released data on the replacement value of the net capital stock and the revised national income accounts to update previous estimates of the rate of return on tangible assets in the corporate sector. In addition to tracking this return, which is defined as corporate capital

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income divided by a measure of the current value of the corporate capital stock, the paper also investigates capital's share of national income. The recent rise in this income share, which equals the rate of return times the capital-output ratio, has attracted attention from both researchers and commentators in the popular press. This income share rose two percentage points between the recession year of 1992 and the most recent year with complete data (1996), and it was at a higher level in 1996 than at any time since 1969. Baker and Mishel (1995) cite changing factor shares as evidence that capital rather than labor has been the primary beneficiary of the current economic expansion. Other accounts, such as Bernstein (1995), suggest that rising international competition and the diffusion of information technology and workplace automation are inducing fundamental and long-term shifts in the relative rewards of capital and labor. This paper explores whether the developments of the 1990s diverge from historical experience with respect to factor shares, and concludes that it is not yet possible to affirm that recent experience is in any sense unusual.

To place rates of return and factor shares in the United States into perspective, this paper also uses data from the OECD Business Sector Databank to explore the trends in rates of return to tangible assets in the G-7 nations. Data for the period 1966-1996 suggest that the recent United States pattern of rising returns is observed in other industrialized nations, with the notable exception of Japan. In spite of this recent comovement, however, the correlation between annual accounting returns on tangible assets in the G-7 countries is low.

The paper is divided into six sections. The first defines the rate of return on corporate tangible assets as well as the capital income share in national income. Section II presents new estimates of the rate of return to capital in the nonfinancial corporate (NFC) sector in the United States, both before and after taxes. This section also considers whether the 1990s represent an unusual period of corporate returns. The third section reports historical data on corporate capital income relative to national income, and disaggregates changes in this income share into changes due to the pretax return on corporate capital and changes due to the size of the corporate capital stock relative to national income. This section also considers the recent evolution of the labor share of national income. Section IV considers international evidence on the rate of return to corporate capital, and it compares recent movements in the profit rate in the United States to that in the other G-7 nations. The fifth section explores the relationship between accounting returns in the national income accounts and alternative measures of the return to capital that could be constructed from capital market data. The analysis focuses on the United States, and finds weak, if any, high-frequency association between these measures. A brief concluding section suggests directions

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for future research directed at understanding the source of fluctuations in NIPA accounting returns.

1 The rate of return and the capital share of national income: definitions

Consider an economy in which corporations produce all output, there are no taxes (so net national product equals national income), and output of the corporate sector (Y) is measured net of depreciation. The accounting identity for corporate cash flow is

$$pY = wL + iB + \pi. \tag{1}$$

In this expression p denotes the nominal price of corporate output, w is the nominal wage, L is the quantity of labor input, B denotes the nominal stock of corporate debt, i is the nominal interest rate on corporate debt, and π denotes corporate profits. The rate of return to corporate capital is defined by:

$$r_K = (\pi + iB)/P_K K \tag{2}$$

where K denotes the constant-dollar stock of tangible assets used in the corporate sector, and p_K is the nominal price of capital assets. The denominator in (2) is the replacement value of the capital stock. The rate of return includes profits, which are ultimately returns to equity investors, either in the form of dividends or retained earnings, as well as interest payments to corporate debt holders. This is the return concept that has been used frequently in attempts to gauge the social return to capital.

The rate of return defined in (2) is related to capital's share of national income,[1] which is defined as

$$s_K = (\pi + iB)/pY. \tag{3}$$

The national income share of labor income is defined, in parallel, as

$$s_L = wL/pY. \tag{4}$$

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[1]The capital income share of national income includes payments to bondholders. In contrast, the share of profits in national income, which is sometimes cited in popular discussions, excludes interest payouts. This ratio, $(pY - wL - iB)/pY$ from above, can fluctuate for reasons related to movements in nominal interest rates and corporate financial policy. A decline in nominal interest rates or in the debt-to-capital ratio would raise the profit share of national income, with no effect on the capital income share. For this reason the analysis below focuses on the corporate capital income share, not the corporate profit share, in national income.

Capital's share of national income is related to the return on capital assets by the identity

$$s_K = r_K * (K/Y)*(p_K/p). \tag{5}$$

The capital share can rise as a result of a rise in the rate of return to capital, a rise in the capital-to-output ratio, or a rise in the relative price of capital goods (p_K/p). These three factors are not independent. An increase in the relative price of capital goods, or an increase in the required return on capital which raises the equilibrium value of r_K, should lead to a reduction in the capital-to-output ratio as firms substitute from capital to labor in response to higher capital input prices. The identity in (5) can nonetheless provide a useful way of understanding changes over time in the capital income share.

Defining factor shares is straightforward in the stylized economy described above, but in practice there are a number of measurement difficulties. First, the NIPA divides national income into payments to employees, corporate profits,[2] and net interest, as well as two other categories that do not appear in the framework above: rental income and proprietors' income. These flows, which accounted for 2.1 percent and 8.4 percent of national income, respectively, in 1996, include both labor and capital income. If an individual is employed by a firm, his earnings will be treated as employee compensation, but if he owns his own business, his compensation will appear as proprietors' income.[3] The definition of capital and labor shares therefore is somewhat arbitrary.

The national income share of rental income displays substantial fluctuation over the 1959-1996 period, while the proprietors' income share displays a downward trend. Proprietors' income represented 12.1 percent of national income in 1960, but only 7.9 percent by 1980. Its share of national income has fluctuated between 6.9 and 8.5 percent over the last fifteen years. Rental income was also a higher fraction of national income at the beginning of the sample–4.3 percent in 1960– than in more recent years. It reached a low of 1.2 percent of national income in the late 1980s, and has subsequently increased to 2.1 percent in 1996.

In addition to the problem of deciding how much of proprietors' and rental income represent labor income, there is a second potential difficulty with the

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[2]Corporate profits are defined inclusive of the capital consumption adjustment (CCAdj), which corrects for differences between true economic depreciation on a replacement-cost basis and on a historical-cost basis, and the inventory valuation adjustment (IVA), which corrects for inflationary over-statement of corporate profits as a result of nominal gains on inventories and work in progress.

[3]A similar problem emerges with some components of rental income. If an individual owns a two-family house, and maintains the building, the return to the labor spent on maintenance activities will appear as rental income, while if he is employed by a landlord who pays him to maintain the building, the value of the same services will be included in labor income.

analysis of national income shares. This is the possibility that changes in the economic environment, particularly in the tax system, can alter the incentives for individuals to receive income in one form or another, and thereby distort the mix of labor versus capital income without any underlying changes in the structure of economic activity. Both Gordon (1997) and Slemrod (1996) discuss methods of transferring income between the personal and the corporate income tax bases, and the effect of corporate and personal income tax rates on the magnitudes of such transfers. The Tax Reform Act of 1986, which reduced the top personal income tax rate to a level below the statutory corporate tax rate, may have encouraged a reclassification of income from corporate to individual earnings. It may therefore have induced a downward bias in post-1986 corporate profits relative to their historical values.

A third practical difficulty with the definition of national income shares concerns the measurement of interest payments. Net interest, a component of national income, equalled $403.3 billion in 1996. This flow is much greater than interest payments by corporations, which equalled $122.7 billion. The national income net interest variable includes corporate interest payments as well as interest paid by sole proprietorships and partnerships, and payments by the "other private business" sector, which includes mortgage payments by households. Owner-occupied housing is treated as a "business" in the national accounts, and the interest payments associated with this "business" are a component of net interest. I am considering the corporate capital income share since this is the national income component that is an expanded version of corporate profits, so I divide net interest payments into the corporate interest flow and a residual category, net noncorporate interest payments.

2   The rate of return on tangible assets in the nonfinancial corporate sector

In 1996, nonfinancial corporations (NFCs) contributed 71.7 percent of the NIPA profit total of $611 billion. Federal Reserve Board seigniorage contributed $19.8 billion (3.2 percent of the total), other financial corporations 12.8 percent of the total ($78.2 billion), and net profits from the rest of the world represented $74.7 billion or 12.2 percent. The latter nets income received by U.S. multinational firms from their subsidiaries operating abroad against payments to foreign multinational firms by U.S. firms with foreign parents.

During the last decade, the financial sector has become a greater contributor to profits. In the last five years of the 1980s, financial corporate profits averaged 5.3 percent of total profits, compared with an average of 11.9 percent of the total in the most recent five years. The "rest-of-the-world" entry

has fallen as a share of profits during the 1990s. This reflects the particular definition of foreign profits in the NIPA. For U.S.-based corporations, foreign earnings as a share of total earnings have increased during this period (see Dhawan (1997)). In spite of the growing importance of financial firms, the difficulties in measuring the rate of return to tangible assets deployed in the financial sector have led most previous studies of corporate returns, including Nordhaus (1974), Feldstein and Summers (1977), Holland and Myers (1979), Feldstein, Poterba, and Dicks-Mireaux (1983), and Rippe and Lavin (1995), to focus on returns to nonfinancial corporations. The present study follows in this tradition.

The "standard" rate-of-return measure for the nonfinancial corporate sector, used in most of the previous studies, equals pretax NFC profits plus net interest payments by NFCs, divided by the replacement cost of NFC tangible assets. This measure understates the return to NFC assets, however, because NIPA removes property taxes, which are classified as an indirect tax, from corporate earnings before defining profits. Feldstein, Poterba, and Dicks-Mireaux (1983) explain that unless property taxes represent fees for services that are provided by state and local governments and that the firm would have needed to purchase otherwise, the pretax return should include these taxes. NFC property taxes are estimated by multiplying the share of tangible assets held by the nonfinancial corporate sector by state and local property tax receipts. This procedure implicitly assumes that the effective property tax rate on property held by the NFCs is equal to that on property held by all other sectors.

Incorporating the foregoing modification for corporate property tax payments, the pretax rate of return on NFC assets equals:

$$r_{K,NFC} = \text{(Profits Before Tax with IVA \& CCAdj +} \qquad (6)$$
$$+ \text{ Net Interest Payments + Property Taxes)/Tangible Assets.}$$

Tangible assets include reproducible tangible assets, plant and equipment, as well as inventories and land. Data on NFC tangible assets are reported in the Federal Reserve Board's *Balance Sheets of the U.S. Economy.* Since the latest release of the *Balance Sheets* does not incorporate the newly-revised BEA capital stocks, I have modified the published data.[4] The Federal Reserve Board reports tangible assets on a year-end basis, so the tangible asset value for year t is the modified *Balance Sheet* value for year $t - 1$.

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[4]Katz and Herman (1997) present new estimates of the aggregate stock of reproducible assets at replacement cost, but they do not present disaggregate estimates for the nonfinancial corporate sector. I have therefore used the ratio of the newly-revised BEA capital stock series from Katz and Herman, to the older unrevised aggregate capital stocks that were the basis for the *Balance Sheets* data, to adjust the sectoral capital stocks reported in the *Balance Sheets.* The end-of-1995 value for tangible assets is extrapolated from the 1994 value.

The importance of the recent data revisions can be illustrated by comparing the unrevised and revised estimates of the net residential and nonresidential capital stocks at current prices. The ratio of the revised to the unrevised capital stocks is shown below. Because the revised capital stocks are sub-

	Nonresidential Capital	Residential Capital
1950	1.425	1.309
1960	1.339	1.253
1970	1.252	1.236
1980	1.224	1.207
1990	1.233	1.251

stantially larger than the unrevised stocks, rates of return calculated on the basis of these revised stocks will generally be lower than returns based on the unrevised capital stocks. In 1994, the unrevised stock of nonresidential and residential capital accounted for 79.2 percent of the tangible assets held by nonfinancial corporations; land and inventories account for the remainder. The upward revision of the capital stock values, holding constant profits and interest payouts, would therefore lower rates of return by roughly fifteen percent. This effect is partly offset by the downward revision of depreciation flows, which raise corporate profits net of capital consumption.

2.1 *Rates of return*

The first column of Table 1 shows the NFC rate-of-return series including property tax payments, and the second column shows the series excluding these payments. The property tax adjustment raises the average return on corporate capital over the 1959-1996 period by a full percentage point. The property tax declined in importance in the 1980s, and the difference between the two return series correspondingly narrowed. Since 1990, however, property taxes have increased, and the disparity between the two return series has also widened.

The sample average pretax return for the 1959-1996 period is 8.5 percent, with a standard deviation of 1.0 percent. This is the rate-of-return estimate that corresponds to the measure, in previous studies, of the social return to capital investment. The subsample means presented at the bottom of Table 1 show substantial variation across decades in the pretax return to NFC assets. The return in the 1960s averaged 10.2 percent, as indicated by the property-tax inclusive return variable, while in the 1980s the return averaged only 7.1

Table 1:
Rate of Return on Nonfinancial Corporate Capital, 1959-1996

| | NFC Pretax Return | | NFC Return After: | |
	Before Property Taxes	After Property Taxes	Corporate-Level Taxes	All Taxes
1959	8.8	8.0	4.2	3.2
1960	8.1	7.3	3.9	2.9
1961	8.2	7.3	4.0	3.0
1962	9.4	8.5	5.0	3.9
1963	10.1	9.1	5.5	4.3
1964	10.9	9.9	6.1	5.0
1965	12.0	11.0	7.0	5.7
1966	12.0	11.0	7.0	5.6
1967	11.0	9.9	6.4	5.0
1968	10.9	9.8	5.9	4.4
1969	9.9	8.8	5.2	3.8
1970	8.1	7.0	4.4	2.9
1971	8.5	7.4	4.7	3.4
1972	8.8	7.7	5.0	3.7
1973	8.8	7.7	4.7	3.2
1974	7.4	6.4	3.6	1.8
1975	7.4	6.5	4.2	2.8
1976	7.6	6.7	4.1	2.9
1977	7.7	6.8	4.1	2.7
1978	7.7	6.9	4.2	2.8
1979	6.8	6.1	3.6	2.3
1980	5.8	5.1	3.0	1.6
1981	6.2	5.6	3.9	2.5
1982	6.1	5.4	4.3	3.3
1983	6.5	5.9	4.5	3.6
1984	7.9	7.2	5.6	4.6
1985	7.7	7.0	5.5	4.6
1986	7.1	6.5	5.0	4.1
1987	7.7	7.0	5.2	4.3
1988	8.3	7.6	5.8	4.8
1989	8.0	7.3	5.6	4.6
1990	7.7	6.9	5.4	4.4
1991	7.3	6.5	5.2	4.3
1992	7.5	6.8	5.2	4.4
1993	8.7	7.8	6.0	5.1
1994	9.5	8.6	6.4	5.5
1995	9.5	8.6	6.3	5.4
1996	9.9	9.0	6.7	5.8
1959-96 Average	8.5	7.6	5.1	3.9
1960-69 Average	10.2	9.3	5.6	4.4
1970-79 Average	7.9	6.9	4.3	2.9
1980-89 Average	7.1	6.5	4.8	3.8
1990-96 Average	8.6	7.7	5.9	5.0

Notes: Column 1 equals (NFC Pre-tax Profits with IVA & CCA + Net Interest + NFC Property Taxes)/NFC Tangible Assets at Current Cost. Column 2 omits property taxes from the numerator. Column 3 replaces before tax profits in column 2 with after-tax profits. Column 4 subtracts an estimate, described in the appendix, of taxes on corporate capital income.

percent.[5] Thus far in the 1990s, the average return has been 8.6 percent, but in the three most recent years, the return averages 9.6 percent.

The average rate of return over the 1994-1996 period has been higher than that in any year since 1969. The recent increase in rates of return was not widely anticipated,[6] but after the fact, one can ask if recent years have, in some sense, been "unusual." One way to address this question is simply by including an indicator variable for the 1994-1996 period in a regression equation for the 1959-1996 period.[7] The coefficient estimate corresponding to this variable is positive, 0.93 with a standard error of 0.72, so one would not reject the null hypothesis that the recent returns are drawn from the same distribution as the returns in the 1959-1993 period. Controlling for the civilian unemployment rate reduces this estimated coefficient to 0.65 (0.63). Thus it does not seem as though there is any evidence, at this stage, that recent experience is extraordinary.

The pretax return on nonfinancial corporate capital is the relevant variable for discussions of the additional national income that would be generated by additional capital investment. From the standpoint of investors who might provide the financial capital to expand the capital stock, however, the after-tax return is of substantial interest. The difference between the pretax and after-tax returns is important as well, since it determines the deadweight burdens associated with the taxation of corporate capital income.

The third column of Table 1 presents the after-corporate-tax return on NFC assets. This series subtracts the two taxes levied at the corporate level, the corporate income tax and the property tax, from pretax profits and interest payments. This return series describes the pretax return available to investors before the payment of any investor-level taxes on capital income. It corresponds to the return available to a nontaxed investor, such as a foundation or a pension fund. This return series averages 5.1 percent, or more than three percentage points less than the pretax return, for the 1959-1996 period. For the most recent six years, the after-corporate-tax return averages 5.9 percent.

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[5]Feldstein, Poterba, and Dicks-Mireaux (1983) use an earlier set of NIPA data to compute rates of return for the period 1947-1979, and report that the mean pretax return for the 1950-1959 period was 11.7 percent. This supports the notion that the currently observed rate of return is not historically unusual.

[6]One indication of the surprise in recent returns can be obtained from federal corporate income tax forecasts. In 1991, the Congressional Budget Office forecast that corporate income tax revenues over the 1993-1996 period would average 1.6 percent of GDP. By 1993, this forecast had been revised upward to 1.8 percent of GDP. Actual corporate income taxes over this period have averaged 2.1 percent of GDP, largely on the strength of higher corporate earnings.

[7]This equation is estimated with an AR(1) correction because the rate-of-return series is highly serially correlated.

The after-corporate-tax return has been substantially higher in the last four years than in previous years because of an increase in pretax profits. When pretax returns were last at their current levels, during the late 1960s, average corporate tax burdens were substantially higher. For the 1965-1969 period, for example, the average pre-property-tax return on NFC assets was 11.2 percent, 2.6 percentage points above the 1990-1996 level, but the average after-corporate-tax return was 6.3 percent, only 0.4 percentage points above the recent level.

The data in the third column of Table 1 describe the after-tax return to an investor who does not face any taxes on capital income, but many investors *do* face such taxes on interest income, dividends, and capital gains. A more complete measure of the tax burden on corporate capital income must consider these taxes. To estimate these taxes, it is necessary to aggregate across different types of investors and to make some strong assumptions about the tax treatment of different types of capital income flows. I follow a procedure suggested in Feldstein and Summers (1979), and extended in Feldstein, Poterba, and Dicks-Mireaux (1983), by computing a "weighted average marginal tax rate" on corporate interest payments, dividend payments, and on the capital gains that are associated with corporate shares. This procedure assumes that nominal capital gains on equities arise from three sources: retained earnings, inflation-induced gains to stockholders as the real value of outstanding bonds is eroded, and nominal appreciation of corporate tangible assets. The second and third factors depend on the rate of inflation, and make the total tax burden on corporate capital income a function of the aggregate inflation rate. The Appendix describes the tax rate algorithm in further detail.

The last column of Table 1 shows the after-tax return to investors after corporation income taxes, property taxes, and investor-level taxes on corporate capital income. The average after-tax return over the 1959-1996 period equals 3.9 percent. For the 1990s, the after-tax return averages 5.0 percent, which is more than sixty basis points higher than in any previous decade. The high after-tax returns of the 1990s reflect both an increase in pretax returns relative to the 1970s and 1980s and a decline in the total tax rate on corporate earnings relative to the 1960s.

2.2 *Average tax burdens*

Table 2 provides more detailed information on the total tax burden that falls on corporate capital income. The first column shows the corporate income tax burden on the nonfinancial corporate sector. For the 1990-1996 period, the average corporate tax burden is 21.5 percent on the average pretax return of 8.6 percent. This is lower than the statutory corporate tax rates of 34 and

35 percent that prevailed during this period because interest payments are included in the pretax return measure but are not part of the corporate tax base, and because various tax provisions such as accelerated depreciation reduce the size of the corporate tax base relative to equity earnings in the NIPA. There has been little change in the average corporate income tax burden in the last fifteen years; this tax rate averages 23 percent in the 1980s and 21.5 percent in the 1990s. The corporation tax burden declined in the early 1980s as a result of the Economic Recovery Tax Act of 1981. The average rate was 33.5 percent in the 1970s. The data do not support claims that the recent increase in after-tax profitability is due to a decline in corporate income taxation.

The second column in Table 2 reports the property tax burden on corporate tangible assets as a fraction of the pretax return. The table shows that this tax leads to a substantial reduction in the after-tax return on nonfinancial corporate assets. The average property-tax burden over the 1959-1996 period is 10.3 percent, with the highest burden in the 1970s, when property taxes averaged 12.2 of pretax profits plus interest. Property taxes tend to be set in proportion to asset values, so the average property-tax burden on corporate capital income rises when the rate of return on corporate assets declines.

The third column of Table 2 reports the average tax burden on the investors who hold corporate debt and equity. Although untaxed institutions such as pension funds and foundations account for substantial and growing shares of both debt and equity ownership, investor-level taxes still contribute to a substantial increase in the total tax burden on corporate capital income.[8] The average tax burden at the investor level, for the 1959-1996 period, is 14.3 percent, with some fluctuation over time. The tax burden peaked in the 1970s, when marginal tax rates on individuals reached 70 percent on unearned income, and inflation generated substantial spurious capital gains and their associated tax liabilities. The decline in marginal tax rates in the 1980s, along with falling inflation, contributed to an investor-level tax burden for the 1990-1996 period that averages 10.8 percent, less than two-thirds of the rate in the 1970s.

The final column of Table 2 reports the total tax rate that applies to corporate capital income. This rate averages 54.1 percent over the 1959-1996 period, and it is roughly twice as great as the corporation income-tax burden alone. The total tax burden shows a substantial decline between the 1970s and the 1990s, from an average of 64 percent to 42 percent. Most of the decline during the 1980s was due to changes in the corporate income tax, while most of the decline between the 1980s and the 1990s has been the

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[8]In 1996, my estimates suggest that 64 percent of corporate equity was held by taxable investors, as was 60 percent of the interest-bearing debt stock of nonfinancial corporations.

Table 2:
Components of Tax Burden on Earnings of NFCs
1959-1996

	Corporate Income Taxes	Property Taxes	Investor Taxes	Total Tax Burden
1959	43.1	9.2	11.7	63.9
1960	41.5	10.4	12.9	64.8
1961	40.5	10.8	12.6	63.8
1962	36.6	9.9	11.8	58.3
1963	36.3	9.4	11.8	57.5
1964	34.3	9.1	10.7	54.1
1965	33.5	8.5	10.4	52.4
1966	33.7	8.5	11.3	53.6
1967	32.3	9.6	12.3	54.2
1968	36.1	9.9	13.7	59.7
1969	36.1	11.0	15.0	62.1
1970	32.4	13.9	17.4	63.6
1971	31.0	13.3	15.9	60.2
1972	31.1	12.4	14.9	58.4
1973	33.8	12.1	17.3	63.2
1974	37.1	14.0	24.1	75.2
1975	30.4	12.7	18.9	61.9
1976	33.8	11.8	16.5	62.1
1977	34.6	11.5	18.2	64.3
1978	34.9	10.2	19.1	64.2
1979	36.2	10.2	20.1	66.6
1980	35.8	11.3	25.2	72.3
1981	27.6	10.5	22.3	60.3
1982	18.4	10.7	17.5	46.6
1983	20.7	10.0	14.4	45.1
1984	20.6	8.6	11.9	41.2
1985	19.1	8.9	11.6	39.6
1986	21.1	9.6	12.1	42.7
1987	23.4	8.9	11.9	44.2
1988	22.5	8.3	11.2	42.0
1989	21.3	9.0	12.4	42.7
1990	20.4	9.7	13.0	43.1
1991	19.0	10.2	12.4	41.6
1992	20.4	10.4	11.0	41.8
1993	20.8	10.2	10.7	41.7
1994	23.0	9.5	9.6	42.1
1995	23.9	9.6	10.0	43.5
1996	23.0	9.2	9.0	41.2
1959-96 Average	29.5	10.3	14.3	54.1
1960-69 Average	36.1	9.7	12.3	58.1
1970-79 Average	33.5	12.2	18.2	64.0
1980-89 Average	23.0	9.6	15.1	47.7
1990-96 Average	21.5	9.8	10.8	42.1

Source: Author's calculations described in more detail in the Appendix.

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result of declining tax burdens at the investor level.

2.3 *Issues of interpretation*

One difficulty with the rate of return as measured in equation (5), and the tax burden as reported in Table 2, is that these are *average* returns and tax rates, not the *marginal* returns and taxes that are likely to drive behavior.[9] Average and marginal returns may diverge for well-known reasons; this makes it problematic to use average return values to evaluate the social return from additional capital accumulation. If firms earn returns on intangible assets that are not included in the measured capital stock, such as patents or trade secrets, then the average return will not equal the marginal return. There is anecdotal evidence that intangible assets, such as software, are an increasingly important share of the total "capital" stock, so the magnitude of this bias may be growing. The share of information-processing equipment in non-residential fixed investment was 28.2 percent in 1995, up from 19.9 percent five years earlier, and 9.9 percent in 1980. Since software and intangible assets are used in conjunction with this equipment, the importance of these intangibles may also have increased. In addition, the types of capital goods that are the subject of new investment may differ from those in the current capital stock, leading to divergence between average and marginal returns.[10] Some economic shocks, such as a change in factor prices, may render existing capital relatively unproductive while raising the return to new investments. Although average returns are often used as an indication of the potential returns from additional capital investment, it is nevertheless important to remember their limitations.

A similar caveat applies with respect to tax burdens. While the tax rate calculations embody estimates of weighted average marginal tax rates where possible, for example with respect to individual interest and dividend tax burdens, at several stages they assume that marginal corporate projects will be financed in the same fashion as the existing stock of projects. While there is no academic consensus on what determines corporate dividend and debt policies, which makes it difficult to improve upon the current "average financial mix" algorithm, it is nevertheless important to flag the average rather than marginal nature of this calculation.

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[9]If the production function is homogeneous of degree one and capital is homogeneous, then the marginal return on corporate capital, F_K, will equal the average return, r_K above, times the relative price of capital goods (p_K/p).

[10]The "putty-clay" nature of capital goods is a key feature of the models developed by Blanchard (1997) and Caballero and Hammour (1997) to explain recent fluctuations in the rate of return in Europe.

3   National income shares

The foregoing discussion has centered on the rate of return to corporate capital, rather than the share of corporate capital income in national income. As noted at the outset, however, the income share and the rate of return are closely related. We now present basic information on the history of profits, corporate capital income, and labor compensation relative to national income.[11] The first column of Table 3 presents time series data on pretax corporate profits, including the capital consumption and inventory valuation adjustments, as a percentage of national income. This is the sum of profits from financial and nonfinancial firms. Seigniorage earnings of the Federal Reserve Board, which are included in the NIPA aggregate for "corporate profits," are excluded from profits in tables throughout this paper. The data show the recent increase in the national income share of corporate profits, as well as the low level of profits in the 1980s by comparison to other decades. The national income share of profits averaged 12.5 percent in the 1960s, 9.9 percent in the 1970s, 8.0 percent in the 1980s, and 9.1 percent for the 1990s (1990-1996). This series displays substantial change in the last half decade, with an increase from 8.2 percent in 1992 to 10.5 percent in 1996. The lowest ratio of corporate profits to national income for this sample period was observed in 1982 (6.4 percent).

The second column of Table 3 reports the ratio of profits plus interest payments to national income, because this ratio is robust to changes in the mix of corporate payouts between debt and equity claimants, and to fluctuations in the nominal interest rate.[12] The profit share of national income and the corporate capital income share move together, but the movements in the latter series are more muted. Between 1992 and 1996, for example, corporate capital income as a share of national income rose 2.0 percentage points, compared with a 2.3 percentage point rise for the profit-to-national-income ratio. In 1992, corporate capital income as a share of national income declined by more than the coincident decline in profits as a share of national income.

The comparison of the first and second columns shows that part of the increase in corporate profits during the last half decade reflects a shift in

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[11]The year 1959 is the start date for a number of data series in the recently-revised national income and product accounts, so it is the beginning of the current paper's sample. While the calculations reported here divide profits and corporate capital income by national income, the patterns would be similar if these series were divided by GDP. National income ($6164 billion in 1996) equals GDP ($7576 billion) less capital consumption ($846 billion), indirect business taxes ($618 billion), and small adjustments for the net international flow of factor income and for the subsidies of government enterprises.

[12]Property taxes, which are considered an indirect tax in the NIPA, are not included in national income. They are therefore excluded from the capital income share calculations in Table 3. The results would not be substantially different if national income were expanded to include property taxes, and these taxes were added to pre-tax corporate capital income.

Table 3:
Profit and Corporate Capital Income as a Share of
National Income, 1959-1996

Year	Profit Share	Corporate Capital Income Share	(Corporate Capital Income)/Assets	Corporate Assets/ National Income
1959	12.6	12.6	7.0	1.793
1960	11.7	11.7	6.6	1.788
1961	11.6	11.8	6.6	1.770
1962	12.4	12.6	7.5	1.686
1963	12.9	13.0	7.9	1.656
1964	13.3	13.5	8.4	1.598
1965	14.0	14.3	9.3	1.542
1966	13.6	14.1	9.3	1.508
1967	12.5	13.3	8.6	1.544
1968	12.3	13.1	8.6	1.526
1969	10.9	11.8	7.7	1.536
1970	8.9	10.2	6.3	1.613
1971	9.8	11.0	6.8	1.621
1972	10.3	11.4	7.2	1.594
1973	10.2	11.3	7.3	1.560
1974	8.5	10.1	6.0	1.683
1975	9.4	11.0	5.9	1.843
1976	10.2	11.3	6.1	1.853
1977	10.9	12.1	6.6	1.833
1978	10.8	12.3	6.8	1.790
1979	9.8	11.6	6.4	1.831
1980	7.9	10.4	5.3	1.960
1981	7.7	10.5	5.3	1.999
1982	6.4	9.4	4.5	2.107
1983	7.9	10.6	5.2	2.051
1984	8.6	11.5	6.2	1.858
1985	8.5	11.3	6.3	1.798
1986	7.8	10.8	6.1	1.765
1987	8.3	11.4	6.8	1.690
1988	8.8	11.8	7.2	1.637
1989	8.2	11.7	7.1	1.643
1990	8.1	11.3	6.9	1.643
1991	8.2	11.1	6.8	1.626
1992	8.2	10.5	7.0	1.502
1993	9.1	11.3	8.0	1.407
1994	9.7	11.8	8.5	1.383
1995	10.0	12.1	8.8	1.368
1996	10.5	12.5	9.3	1.346
Averages:				
1959-96	10.0	11.7	7.1	1.683
1960-69	12.5	12.9	8.0	1.615
1970-79	9.9	11.2	6.5	1.722
1980-89	8.0	10.9	6.0	1.851
1990-96	9.1	11.5	7.9	1.468

Source: Author's calculations based on data from Table 1.16 of the NIPA, and Table Z.1 of the Federal Reserve Board *Balance Sheets of the U.S. Economy*, updated to incorporate newly revised estimates of the replacement cost of the residential and nonresidential capital stock. Tangible assets entry for 1995 year end is extrapolated based on 1994 value.

the allocation of corporate cash flow from interest payouts to dividends and retained earnings. In 1990, net interest payments by domestic corporations were 113.5 percent of dividend payments. By 1996, they had declined to 56.2 percent. The decline of interest payouts reflects falling nominal interest rates as well as a changing debt-to-capital ratio. In 1990, the BAA interest rate averaged 10.36 percent, compared with 8.29 percent in mid-1996. If the interest rate on all corporate borrowing in 1990 had been (8.29/10.36) times its actual level, then interest payments would have been 90.8 percent as large as dividends, rather than 113.5 percent. This suggests that changes in nominal interest rates can explain approximately half of the movement in the interest-to-dividend ratio over the last six years.

The ratio of corporate capital income to national income (Y) can be decomposed into the product of two ratios:

$$(\text{Profits } + \text{ Interest})/Y = \{(\text{Profits } + \text{ Interest})/\text{Assets}\}^*(\text{Assets}/Y). \quad (7)$$

For the purposes of this calculation, tangible assets are measured at replacement cost ($p_K K$ in the notation above) and they include assets held both by the financial and nonfinancial sectors. Tangible assets for the entire corporate sector were computed, starting from entries in the Federal Reserve Board *Balance Sheets of the U.S. Economy*, in the same fashion as tangible assets of the NFCs, above.

The third and fourth columns of Table 3 show the two ratios that are multiplied on the right-hand side of (7). The third column is very similar to the rates of return discussed above; it applies to the entire corporate sector rather than the nonfinancial corporate sector. The movements are similar and will not be discussed further. The last column in Table 3, which reports the ratio of tangible assets to national income, is more interesting. This capital-to-output ratio averages 1.68 over the 1959-1996 period, with some variation. The asset-to-income ratio rises throughout the 1970s and early 1980s, and then begins to decline in the mid-1980s. It declines more rapidly in the 1990s than in the previous decade. The ratio of the replacement value of corporate assets to national income declined from an average value of 1.59 in 1990-92, to 1.35 in 1996, or just over fifteen percent. The ratio of the replacement value of the capital stock to national income is now at its lowest level in the post-1959 period.

The recent decline in the assets-to-national-income ratio $(p_K K/pY)$ is the result of changes in the relative price of tangible assets p_K/p, not changes in the ratio of physical capital to output (K/Y). The year-end replacement value of plant and equipment relative to national income declined by three percent (from 1.106 to 1.074) between 1990 and 1994, and the ratio of inventories to national income fell from 0.220 to 0.200. The decline in the tangible-asset to national-income ratio over this period, from 1.664 to 1.441,

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is thus almost completely the result of a decline in the ratio of land values to national income. The land-to-national-income ratio falls from 0.306 in 1990 to 0.138 in 1994. This decline, in turn, is due to the fall in the estimated market value of commercial real estate relative to national income during this period. The *Balance Sheets* compute land values as a residual after subtracting the Commerce Department's estimate of the replacement cost of corporate residential real estate from a market-value estimate for commercial real estate.

While Table 3 presents information on the corporate capital income share of national income, much recent attention among researchers (for example, Baker and Mishel (1995)) and in the popular press (for example, Bernstein (1995)) has focused on movements in labor's share of national income. The foregoing discussion noted that while corporate capital income and labor income represent most of national income (85 percent in 1996), the labor share is not simply one minus the corporate capital share. Proprietors' income, rental income, and interest payments from noncorporate payers are also components of national income.

Table 4 reports three measures of labor's share of national income. The first column tracks employee compensation as a percentage of national income for the post-1959 period. This series averages 71.5 percent over the 1959-1996 period, and in the last ten years it has fluctuated between 71.7 percent (1989) and 73.1 percent (1992). The 1996 value, 72.2 percent, is at the lower end of the range for the last decade, but hardly low in historic terms. The second column of Table 4 shows only wages and salaries as a percentage of national income. Employee compensation includes wages as well as the costs of employer- provided benefits.[13] While recent year-to-year changes in wages and salaries track changes in total compensation very well, over a longer time period the share of wages and salaries in national income trends downward, while employee compensation as a share of national income has remained in a narrow range since the 1960s. These divergent patterns reflect the growing share of nonwage benefits, particularly employer-provided health insurance and retirement benefits, in employee compensation.

The last column of Table 4 combines proprietors' income with employee compensation to create an expanded measure of labor's share of national income. Part of proprietors' income is capital income, but part is labor income, so this measure is probably an over-estimate of labor's share. Employee compensation as a share of national income averages 71.5 percent over the 1959-1996 period, while adding proprietors' income raises the average to 80.7 percent. The expanded definition of labor income shows the same gen-

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[13]Some employer-provided benefits, such as employer-provided health insurance, are provided voluntarily, while others, such as the employer share of Social Security and Medicare taxes, are mandated.

Table 4:
Labor Shares of National Income
1959-1996

	Employee Compensation	Wages & Salaries	Employee Compensation & Proprietors' Income
1959	67.9	62.8	80.5
1960	69.0	63.5	81.1
1961	68.7	63.1	80.9
1962	68.4	62.5	80.1
1963	68.2	62.2	79.7
1964	68.2	62.1	79.3
1965	67.5	61.4	78.5
1966	68.3	61.7	79.0
1967	69.4	62.6	79.7
1968	70.2	63.1	80.3
1969	71.8	64.4	81.6
1970	73.5	65.6	83.1
1971	72.7	64.3	82.2
1972	72.3	63.5	82.1
1973	71.8	62.6	82.1
1974	73.5	63.6	83.0
1975	72.8	62.4	82.2
1976	72.7	61.6	81.9
1977	72.2	60.7	81.2
1978	71.9	60.2	81.0
1979	72.3	60.4	81.2
1980	73.7	61.4	81.6
1981	73.1	60.7	80.6
1982	74.1	61.3	81.0
1983	73.2	60.3	80.1
1984	71.3	58.6	79.2
1985	71.7	59.0	79.6
1986	72.5	59.6	80.3
1987	72.3	59.6	80.3
1988	71.7	59.2	79.8
1989	71.7	59.1	79.8
1990	72.1	59.3	80.1
1991	72.6	59.4	80.5
1992	73.0	59.5	81.5
1993	72.7	59.1	81.0
1994	72.4	58.8	80.8
1995	72.4	58.9	80.8
1996	72.2	58.9	80.6
Averages:			
1959-96	71.5	61.2	80.7
1960-69	69.0	62.6	80.0
1970-79	72.6	62.5	82.0
1980-89	72.5	59.9	80.2
1990-96	72.5	59.1	80.8

Source: Author's calculations based on data from Table 1.16 of the National Income and Product Accounts.

eral pattern of stability as the employee compensation series alone, as it also displays some decline during the 1990s.

4 Recent movements in factor shares: is there a story?

The 0.9 percentage-point decline in employee compensation as a share of national income over the last four years has prompted some discussion, for example, Baker (1995) and Bernstein (1995), of shifting factor shares in the U.S. economy. Yet several points suggest that it is premature to consider recent changes as demanding of special note. First, the labor income share in 1992 was higher than at any time since 1983, and it was the sixth highest year in the post-1959, or the post- 1947, period. Some decline from this high level would not be unexpected. Second, the labor share is a cyclical time series, and much of its variation can be explained by fluctuations in aggregate economic activity. Regressing the labor share on the civilian unemployment rate for the 1959-1992 period suggests that each one-percentage-point increase in the unemployment rate coincides with a 0.0067 change in the compensation share of national income. The civilian unemployment rate for 1992 averaged 7.49 percentage points, and for 1996 it averaged 5.38 percentage points. The historical relationship between the unemployment rate and the compensation share would therefore predict a decline of .0142 in the compensation share between 1992 and 1996. This decline is larger than the observed change. Straightforward cyclical correction therefore suggests that the recent events do not reflect an unusual decline in labor's share.[14]

Finally, there are substantial year-to-year fluctuations in national income shares, and recent changes are not unusually large. Table 5 shows the standard deviation of the one-year and four-year changes in various time series relating to the national income shares. The standard deviation of the year-to-year change in the compensation (wage) share is 0.80 (0.72) percentage points, and the standard deviation of the four-year change is 1.6 (1.5) percentage points. Thus the change in the last four years is well within the range of change that is suggested by historical experience. These statistical observations, in conjunction with the measurement issues raised earlier, caution against concluding that recent developments represent an important

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[14]To formally test this hypothesis I estimated an AR(1) regression model in which the compensation share of national income was related to the civilian unemployment rate and a dummy variable set equal to 1 in 1996, and -1 in 1992 (this captures the 1992-1996 change). The coefficient estimate was -0.00129 (0.00463), which suggests that only a one-tenth of one-percentage-point decline in the compensation share needs to be "explained" in these two years, and that the difference between the two years is statistically insignificant.

departure from past experience.[15]

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Table 5:
Standard Deviation of Year-to-Year Changes in
National Income Shares, 1959-96

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	Standard Deviation	
	One Year Change	Four Year Change
Corporate Profits	0.85	1.81
Corporate Capital Income	0.71	1.45
Employee Compensation	0.80	1.60
Wages and Salaries	0.72	1.50
Employee Compensation		
& Proprietors' Income	0.64	1.43
Tangible Assets/National Income	0.07	0.18

Source: Author's calculations based on data in Table 1.16 of NIPA and the
Balance Sheets of the U.S. Economy. See notes to Tables 3 and 4 for further
information. The standard deviation of four-year changes is calculated as the
standard deviation of all four-year changes in the sample, thus it includes
overlapping observations.

5 International comparisons of rates of return and factor income shares

The foregoing analysis of rates of return on corporate assets in the United
States suggests that returns have been higher in the 1990s than in the recent
past, but that the rise in returns is not outside the range of historical ex-
perience in the United States. A different, but related, question is whether
these movements are unusual in comparison with returns in other nations.
While the present paper focuses on the measurement of returns, a natural
follow-on project would attempt to explain what determines fluctuations in
returns. Barro and Sala-i-Martin (1990) and Blanchard and Summers (1984)

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[15]Note that there could be substantively and statistically significant changes in the rate
of return to corporate capital during a period when there were no statistically significant
changes in the labor-income share. This is because the labor-income share is approximately
one minus $r_K*(K/Y)^*(p_K/p)$, so changes in r_K could be offset by changes in the capital-
output ratio or the relative price of capital. The decline in K/Y during the 1990s has
made the changes in factor income shares less significant than the change in r_K.

attempt such an explanation for the pattern of real interest rates in the 1980s. For understanding the source of return fluctuations, it can be helpful to compare the experiences of different nations. If the rates of return in most major industrial nations move together, that would suggest that common shocks could explain a substantial share of the variation in observed returns. Relatively low rates of correlation across nations, in contrast, would point toward idiosyncratic factors such as country-specific investment opportunities as determining these patterns.

Creating comparable measures of the rate of return to corporate capital in many nations is a difficult data problem, since there are differences in definitions and measurement algorithms, particularly for capital stocks, across countries. The OECD has attempted to systematize the accounts from OECD member countries, and publishes a time series on rates of return on capital in the business sector in each issue of the *OECD Economic Outlook*. The underlying data are available in the OECD Business Sector Data Bank. Blanchard (1996) analyzes these data in some detail; Glyn (1997) also examines recent changes in profit rates around the OECD. From this data base it is possible to construct rate-of-return measures, in principle analogous to those above, for the G-7 countries (France, Germany, Italy, Japan, the United Kingdom, and the United States) for the period 1965-1996.[16] While comparing the levels of returns across countries is likely to be confounded by differences in data construction, comparing the changes in profit rates is still possible.

Table 6 shows the rate of return to capital in the business sector for each of the G-7 countries over the 1965-1996 period. In the 1990s, the rate of return has increased in all but one of the G-7 nations. Japan is the outlier, with a return decline of more than two percentage points between 1989-1990 and 1995. In the OECD data, the rate of return on U.S. business-sector capital rose by 1.7 percentage points between 1991 and 1996. The change was 3.5 percentage points in the U.K., 2.1, 1.8 and 1.7 percentage points in Canada, Italy, and Germany, respectively, and 0.6 percentage points in France. Thus the recent movement in the U.S. corporate return is smaller than that in a number of other major industrial nations.[17] The average return in the G-7 nations rose by 1.5 percentage points, from 13.6 percent to 15.1 percent,

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[16]The OECD data bank includes data for some countries beginning in 1961, and there are missing entries for 1995 and 1996 in some countries as well. The recent missing entries were spliced using data published in the June 1997 *OECD Economic Outlook.*

[17]The *level* of the returns for the United States in Table 6 is roughly twice that in the earlier estimates, based on NIPA, for the nonfinancial corporate sector. This reflects some differences between the definition of the "business sector" in the OECD and the NIPA data, as well as a more limited definition of business assets in the OECD. More worrying than the difference in levels is the low correlation (0.23) between the data series in column one of Table 1 and column one of Table 6.

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Conclusion : OECD
database = not good?

between the 1980s and the 1990s. The change in the United States over this time period was somewhat larger, 2.6 percentage points.

In keeping with the discussion in previous sections regarding the year-to-year fluctuations in measured rates of return, the last row of Table 6 reports the standard deviation of the annual change in the reported return on business assets. The standard deviations average 0.9 percentage points, suggesting that a 95-percent confidence interval for the year-to-year changes in these rates of return would be nearly four percentage points wide. This underscores the limited information on returns that is available from the relatively short time series being analyzed here.

Table 7 explores the correlation structure of measured returns in the G-7 countries. It reports the set of pairwise correlations between returns in different nations. The average of the twenty-one correlations in the table is 0.31. Four of the twenty-one correlation coefficients are negative. Thus the evidence does not support strong comovement in rates of return as a general rule, even though recent experience suggests that most rates of return have increased. These findings suggest that much of the variation in measured returns may be explained by idiosyncratic rather than common factors. It is also possible that the average returns considered here are measured with substantial noise, and that uncorrelated measurement error masks a stronger correlation among actual returns.[18]

The international evidence can also provide soe perspective on recent movements in the labor-income share of national income in the United States. Table 8 presents the labor share for the G-7 nations over the 1966-1995 period. The data show very little change in the labor share in the United States during the last decade, although the average for the 1990s (66.2 percent) is 0.5 percentage points lower than the average for the 1980s. In contrast, the average labor share for the G-7 declined by 1.4 percentage points between the 1980s and the 1990s, and the most recent data (1995) are substantially below the early 1990s. There are sharp differences across countries in the evolution of the labor share, with declines in the continental European countries during the last decade, and some evidence of an increase in Canada and the United Kingdom. Explaining these divergent patterns is beyond the current project. Blanchard (1997) relates changing labor shares to different labor-market institutions, and different macroeconomic shocks, affecting the

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[18]In a setting with much higher quality data, such as real interest rates, other studies reach different conclusions about the degree of capital market integration. Barro and Sala-i-Martin (1990, p. 58) report that "each country's expected real interest rate depends primarily on world factors" (although they find Japan and the U.K. to have substantial idiosyncratic components). Mishkin (1984), however, concludes (p. 1354) that "the empirical evidence...strongly rejects the null hypothesis of the equality of real euro rates across countries." Orr, Edey, and Kennedy (1995) also find significant explanatory power for country-specific variables in their model of real long-term interest rates in the OECD.

Table 6:
Comparative Rates of Return on Business Assets,
G-7 Nations, 1966-1996

	U.S.	Germany	France	Italy	Canada	U.K.	Japan	G-7 Average
1966	14.3	15.6	11.0	13.9	13.5	11.8	23.2	14.8
1967	14.3	15.0	12.3	15.5	12.2	12.1	24.6	15.1
1968	14.4	16.5	13.0	16.2	12.8	12.1	26.2	15.9
1969	13.7	16.3	13.8	17.0	12.3	11.5	27.0	16.0
1970	12.9	15.3	14.1	15.5	14.4	10.8	26.4	15.6
1971	13.6	14.7	14.0	13.5	13.8	11.2	22.6	14.8
1972	14.3	14.6	14.3	13.9	14.0	11.1	21.9	14.9
1973	15.0	14.4	14.8	14.0	16.4	11.3	20.3	15.2
1974	13.7	13.0	13.3	13.0	16.7	9.7	16.1	13.6
1975	13.5	12.5	11.3	11.1	15.9	8.7	14.1	12.4
1976	14.2	13.2	11.3	11.6	15.6	9.6	14.1	12.8
1977	14.6	13.1	11.4	11.3	15.1	10.2	13.8	12.8
1978	15.2	13.2	11.7	11.8	16.1	10.2	14.6	13.3
1979	15.0	13.1	11.6	12.6	17.8	9.6	14.3	13.4
1980	13.9	11.7	10.6	12.5	19.2	8.5	14.0	12.9
1981	13.9	11.1	10.4	11.6	18.5	8.2	13.6	12.5
1982	12.7	10.9	10.3	11.6	16.1	9.0	13.2	12.0
1983	14.3	11.7	10.5	11.7	18.0	9.9	13.1	12.7
1984	15.8	12.1	11.0	12.5	19.5	10.0	13.6	13.5
1985	16.2	12.3	11.5	12.8	19.6	10.3	14.1	13.8
1986	16.2	12.8	12.9	14.2	19.3	9.8	14.4	14.2
1987	16.2	12.6	13.2	14.3	20.0	10.3	14.3	14.4
1988	16.5	13.2	14.1	14.8	20.4	10.3	15.1	14.9
1989	17.5	13.5	14.8	14.9	19.9	9.8	15.5	15.1
1990	17.3	14.2	14.7	14.6	18.3	9.3	15.6	14.8
1991	16.8	13.3	14.5	14.4	17.7	9.0	15.5	14.5
1992	17.6	13.1	14.6	14.3	17.5	10.0	14.8	14.6
1993	18.1	12.8	14.2	14.1	17.9	11.3	14.5	14.7
1994	18.6	13.6	15.1	15.5	18.7	12.1	14.1	15.4
1995	18.6	14.4	15.4	16.1	19.8	11.9	13.7	15.7
1996	18.7	15.0	15.3	15.9	19.9	12.5	14.5	16.0
Averages:								
1966-96	15.4	13.5	12.9	13.8	17.0	10.4	16.9	14.3
1960-69	14.2	15.8	12.5	15.6	12.7	11.9	25.3	15.4
1970-79	14.2	13.7	12.8	12.8	15.6	10.2	17.8	13.9
1980-89	15.3	12.2	11.9	13.1	19.0	9.6	14.1	13.6
1990-96	17.9	13.8	14.8	15.0	18.5	10.9	14.7	15.1
S.D.(Δ)	0.7	0.7	0.7	0.9	1.1	0.7	1.3	

Source: Author's calculation based on data in OECD Business Sector Data Base. The return on business assets is defined as business sector output, less wage payments, divided by the current cost estimate of the business sector capital stock. The last row, S.D.(Δ), reports the standard deviation of the annual changes in the rates of return.

Table 7:
Correlation Matrix for Rates of Return on Business Capital, G-7 Nations

	Japan	Germany	France	Italy	U.K.	Canada
U.S.	-0.41	0.03	0.63	0.44	0.29	0.65
Japan	1.00	0.83	0.22	0.55	0.55	-0.80
Germany		1.00	0.53	0.75	0.76	-0.58
France			1.00	0.76	0.50	0.12
Italy				1.00	0.69	-0.09
U.K.					1.00	-0.33

Source: All correlations are based on rates of return reported in Table 6. Correlations are estimated for the period 1966-1996. Underlying data drawn from the OECD Business Sector Data Base.

various OECD nations.

6 Accounting returns versus financial market returns

The results in this paper focus on "accounting" rates of return, rather than rates of return measured in capital markets. One question that arises in discussions of the social return to capital accumulation concerns the choice between these alternative measures of returns.[19] To place the accounting returns on NFC corporate assets in context, I computed the average return over the 1959-1996 period to an investor who held debt and equity securities issued by nonfinancial corporations in proportion to their market values. I measured the equity return as the real return on large capitalization stocks, and the bond return as the real return on long- term corporate bonds, as reported in Ibbotson Associates (1997).[20] The average pretax real return on this debt and equity portfolio was 6.6 percent, with a standard deviation of 14.0 percent. This should be compared with the average after-corporate-

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[19]Summers (1990) raises this question and a number of related ones, such as the appropriate treatment of risk in the definition of the social rate of return.

[20]I estimated the market value of debt and equity in nonfinancial corporations by capitalizing net interest payments (using the BAA interest rate) and dividend payments (using the dividend yield on the S&P500). The resulting market-value debt-equity ratio displays substantial variation over time. In 1960, the market value of equity represented 81 percent of the total market value of the nonfinancial corporate sector. This ratio declined to 72 percent in 1970, and 67 percent in 1980, and has subsequently increased to 87 percent in 1996. Data for mid-1997 would likely show an even higher ratio.

Table 8:

Labor Shares of Business Sector Output, G-7 Nations, 1966-1995

	U.S.	Germany	France	Italy	Canada	U.K.	Japan	G-7 Average
1966	66.8	63.6	71.2	62.9	69.3	69.8	59.0	66.1
1967	66.6	62.9	68.3	63.0	71.4	69.4	57.8	65.6
1968	67.2	61.4	69.0	61.9	69.9	69.0	56.7	65.0
1969	68.7	62.2	68.2	60.4	70.8	69.8	56.6	65.2
1970	69.7	64.1	67.6	62.9	65.8	71.4	57.4	65.5
1971	68.2	64.7	67.8	65.0	66.0	69.2	61.4	66.0
1972	67.9	65.1	67.1	64.6	65.9	68.8	62.0	65.9
1973	67.8	66.0	66.6	64.3	63.5	68.8	63.8	65.8
1974	69.2	67.7	68.0	64.0	63.1	71.3	67.1	67.2
1975	67.2	67.4	71.4	68.0	64.0	73.9	70.3	68.9
1976	66.9	66.4	71.2	66.7	64.7	71.0	70.5	68.2
1977	66.6	66.7	70.7	67.0	65.5	68.0	71.0	67.9
1978	66.5	66.3	70.1	66.1	63.9	67.5	69.7	67.2
1979	66.8	66.5	70.0	65.1	62.2	68.7	69.6	67.0
1980	67.9	68.7	71.7	64.6	62.0	70.9	69.1	67.8
1981	67.3	69.1	71.8	65.4	63.4	71.1	69.7	68.3
1982	68.4	68.7	71.5	65.2	64.7	69.3	70.2	68.3
1983	66.7	66.5	70.8	65.9	61.9	67.7	70.4	67.1
1984	66.0	65.5	69.3	64.3	60.6	68.1	69.5	66.2
1985	65.9	65.0	68.0	63.8	61.2	67.8	68.1	65.7
1986	65.9	64.3	65.1	61.9	62.2	69.0	67.1	65.1
1987	66.6	64.7	64.5	61.8	62.3	68.5	67.2	65.1
1988	66.8	63.7	63.1	61.2	62.6	69.2	66.0	64.7
1989	65.5	62.9	62.0	61.4	63.1	70.5	65.5	64.4
1990	66.0	62.0	62.4	62.2	64.6	72.0	65.2	64.9
1991	66.5	64.1	62.1	63.1	66.1	73.2	64.9	65.7
1992	66.2	64.8	61.9	63.0	66.8	71.9	64.9	65.6
1993	66.1	64.7	62.2	61.8	66.4	69.9	64.8	65.1
1994	65.9	63.3	60.6	58.6	65.3	69.2	65.6	64.1
1995	66.3	62.2	60.3	57.1	64.6	69.2	66.3	63.7
Averages:								
1966-95	67.0	65.0	67.1	63.4	64.8	69.8	65.6	66.1
1960-69	67.3	62.5	69.2	62.0	70.3	69.5	57.5	65.5
1970-79	67.7	66.1	69.0	65.4	64.5	69.9	66.3	67.0
1980-89	66.7	65.9	67.8	63.5	62.4	69.2	68.3	66.3
1990-95	66.2	63.5	61.6	61.0	65.6	70.9	65.3	64.9
S.D.(Δ)	0.9	1.1	1.3	1.4	1.5	1.5	1.4	

Source: Author's calculation based on data in OECD Business Sector Data Base. The labor share is defined as labor compensation divided by total output of the business sector. The last row, S.D.(Δ), reports the standard deviation of the annual changes in the rates of return.

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tax accounting return of 5.1 percent over this time period, with a standard deviation of 1.0 percent. Thus the NIPA "accounting return" is somewhat lower than the capital-market return, but not by enough to reject the null hypothesis that the two returns are equal.[21]

A related issue about the relationship between accounting and financial-market returns concerns the recent increase in corporate profits and the co-incident increase in the market value of U.S. stocks. Part of the popular interest in recent changes in the labor-income share of national income may be related to the high returns being earned by stock-market investors in the mid-1990s. Two points about the relationship between corporate capital income and the level of the stock market bear note.

First, earnings growth has been an important factor in the recent rise in equity values. Between the fourth quarter of 1992 and the fourth quarter of 1996, the price-earnings ratio for the firms in the Standard and Poor's 500 declined from 22.8 to 19.1, while the share price index rose 70.6 percent. Thus earnings growth, at least over this period, has been even faster than the growth in share values.

Second, there are important differences between the after-tax earnings that matter for stock-market values and the NIPA measures of profits and corporate capital income that are discussed in this paper. NIPA profits correspond to the domestic earnings of U.S.-based corporations, plus the profits of U.S.-based subsidiaries of foreign multinational corporations. These earnings therefore do not correspond to the worldwide earnings of the corporations traded on U.S. equity markets. Dhawan (1997) estimates that 35 percent of the earnings of corporations in the Standard and Poor's 500 Index are generated from foreign operations. For some firms, the fraction is much higher: 85 percent of Coca-Cola's current profits are from overseas.

The difference between NIPA earnings and "stock-market" earnings can be illustrated for recent years. Between the fourth quarters of 1992 and 1996, the nominal earnings of firms in the S&P500 increased by 104 percent. Over the same time period, after-tax corporate profits in the national income accounts rose 43 percent in nominal terms. While both measures suggest that corporate profits rose, the divergence between the two series cautions against using NIPA data to investigate movements in share prices.

Could be easily corrected by adding net foreign K income to domestic K income

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[21]The standard error of the mean estimate for the financial-market return is 2.3 percentage points, so the average accounting return is within a one-standard-deviation confidence interval of the financial market return.

7 Further directions

This paper has presented new evidence on the rate of return to corporate tangible assets in the United States, and on relative movements in the share of capital and labor in national income. Newly-revised estimates of the replacement cost of the corporate capital stock suggest that the average pretax rate of return in the nonfinancial corporate sector, over the period 1959-1996, has been 8.5 percent. Taxes on corporations and the investors who supply capital to corporations have absorbed, on average, 54.1 percent of this return, leaving an average after-tax return to investors of 3.9 percent. The paper also considers movements in factor income shares, and finds that although rates of return on corporate assets have increased in the 1990s, a decline in the capital- to-output ratio has resulted in very little change in the national income shares accruing to capital and labor. The rise in rates of return in the United States during the current decade coincides with an increase in returns in most other industrialized nations.

The results in this study provide updated information of a type that has been used in past research to evaluate the social returns to capital formation. For those who rely on such estimates, the new data should prove useful. However, this paper has not directly addressed the set of difficult issues that arise in translating average returns such as those reported here into estimates of the social return to additional capital accumulation. These include the difference between marginal and average returns, the choice between rate-of-return measures based on accounting data and those based on financial-market data, and the possibility that rents or monopoly power make the social rate of return different from the private return. Rotemberg and Woodford (1997) discuss some of these issues in the context of a general equilibrium model with imperfect competition. All of these issues require further analysis.

This paper has also stopped short of explaining time-series fluctuations in accounting rates of return, or the financial market returns that are associated with claims on corporate assets. Any such analysis requires a fully-specified model of capital market equilibrium, with appropriate attention to issues such as the degree of integration across international capital markets and the source of exogenous shocks to financial markets. Given the conflicting empirical evidence to date on the degree of linkage in global capital markets, and the importance of such linkage for a range of questions in applied macroeocnomics, further attention to these issues is warranted.

Appendix: Calculation of Tax Burden on NFC Investors

The procedure that I use to estimate the total tax burden on investors in the nonfinancial corporate sector draws heavily on previous estimates by Feldstein and Summers (1979), Feldstein, Poterba, and Dicks-Mireaux (1983), and Poterba (1987). There are two steps to this procedure.

The first involves computation of a weighted-average marginal tax rate on the interest payments and dividends of the NFCs. To do this I exploit data on asset holdings by various investor groups, as well as the structure of NFC liabilities, in the Federal Reserve Board *Flow of Funds*. With respect to equity ownership, I assume that equity held by households (E_{hh}), life insurance companies (E_{li}), other insurance companies (E_{oi}), commercial banks (E_{cb}), brokers and dealers (E_{se}), and savings banks (E_{sa}) generates taxable income. (The Flow of Funds accounts are "net" of equity held within the corporate sector, so there is no intercorporate equity ownership to be considered.) I allocate equity held by mutual funds to the set of investors in mutual funds based on their proportional ownership of outstanding funds. The weighted average dividend tax rate in a given year is therefore:

$$\tau_{DIV} = (\tau_{DIV,hh}*E_{hh} + \tau_{DIV,li}*E_{li} + \tau_{DIV,oi}*E_{oi} + \\ + \tau_{DIV,cb}*E_{cb} + \tau_{DIV,se}*E_{se} + \tau_{DIV,sa}*E_{sa})/E_{tot}$$

where E_{tot} denotes the total stock of equity outstanding, including equity held by tax-exempt institutions. With respect to the household sector, I assume that seven percent of equity holdings are in fact held by tax-exempt institutions, and use the weighted average marginal tax-rate series for dividend income in Poterba (1987, 1997) to define $\tau_{DIV,hh}$ in each year. The dividend tax rates for the various financial institutions recognize the intercorporate dividend exclusion rules as well as variation over time in statutory corporate marginal tax rates.

The marginal tax rate on dividends for both corporations and individuals includes state and local as well as federal income taxes. For individuals, state and local taxes are included by multiplying the weighted average federal marginal tax rate $(\tau_{DIV,fed,hh})$ by a factor that depends on an estimated state and local income tax rate, equal to the ratio of state and local income tax collections in the NIPA divided by national income less corporate profits. The adjustment takes the form $\tau_{DIV,hh} = \tau_{DIV,fed,hh}*(1 + \tau_{SL}*(1 - \tau_{DIV,fed,hh}))$ where τ_{SL} is the estimated state and local income tax rate. For corporations, I gross up the federal statutory marginal tax rate on corporate income by the ratio of federal plus state and local corporate income tax collections, divided by federal collections.

With respect to debt, the algorithm for estimating the weighted average tax burden is similar to that for equity, with two differences. First, I calculate weighted average marginal tax rates for three classes of credit-market liabilities of the NFCs: corporate bonds, open market paper, and commercial mortgages. For each type of debt, I construct ownership shares as for equity above, using the relevant data from the Flow of Funds, and I compute the weighted average interest marginal tax rate on this type of debt. The three resulting marginal tax rates are then combined with weights equal to the fractions of bonds, mortgages, and commercial paper plus bank acceptances in NFC credit-market liabilities. By dividing by credit-market liabilities I effectively assume that all other types of debt, including trade debt, tax-exempt bonds, and taxes payable, do not generate interest or associated tax burdens. This is a conservative assumption with respect to the marginal tax burden on NFC interest payouts. For consistency I use the weighted average marginal tax rate on household dividend receipts for the interest income tax rate as well; this allows for a single "representative investor" in the household sector.

Appendix Table A-1 shows the weighted average marginal tax rates on NFC dividend payouts, and interest income, that result from these calculations. The tax rates vary as a result of changes in the statutory tax rates faced by different investor classes, and as a result of changes in the distribution of stock and bond holdings across different groups with different marginal tax rates. The rise of equity ownership by pension funds during the last three decades, for example, combines with declining statutory marginal tax rates on households to reduce the marginal tax rate on dividends.

The second step in the procedure involves estimating the capital gains tax liability associated with NFC operations. Capital gains on shares can come from three sources: retained earnings that are used to purchase assets, inflationary appreciation of the nominal assets that NFCs hold, or inflation-induced revaluation of outstanding corporate liabilities, which accrues to the benefit of shareholders. To estimate the second and third components of capital gains, I assume that the capital stock appreciates at the rate of growth of the chain-weighted GDP deflator, and I construct (Inflation Rate$_t$)* (Tangible Assets$_{t-1}$) as an estimate of the nominal revaluation of assets. For the inflationary gain on corporate debt, I apply the same inflation rate to an estimate of the market value of NFC debt based on net interest payments capitalized at the annual average of the BAA interest rate.

Table A-1 shows the three resulting components of imputed capital gains. There is substantial fluctuation in retained earnings, and in most recent years the inflation-induced revaluation of corporate assets exceeds the retained earnings as shown in the NIPA. The inflationary gains on corporate debt and the inflation-induced asset revaluation term peak during the high inflation

period of the late 1970s (the entries in Table A-1 are in nominal dollars).

The total capital gain on corporate shares, equal to the sum of the three components in Table A-2, is assumed to face taxation at a weighted average marginal tax rate on capital gains, with weights corresponding to the equity ownership fractions above. For households, I make the conservative assumption that the top statutory marginal tax rate is reduced by half on account of capital gains deferral, and half again because some gains escape taxation through basis step-up at death. In 1996, when the top statutory marginal tax rate on capital gains was 28 percent, this results in an "effective" marginal tax rate of 7 percent. For the financial institutions in the equity ownership matrix, I follow Feldstein and Summers (1979) and assume a fifteen-percent marginal tax rate on capital gains in all years.

The foregoing calculations of the average marginal tax rates that apply to each type of capital income generated by the NFCs are combined as follows. Total investor taxes in each year are then equal to:

$$\text{TAX}_{investor} \;=\; \tau_{DIV} * \text{DIV}_{NFC} + \tau_{INT} * \text{INT}_{NFC} + \tau_{CG} * \\ (\text{Retained Earnings } + \text{ Revaluation } + \text{ Debt Gain}).$$

The tax burden due to investor taxes is then computed as $\text{TAX}_{investor}/$ (Profits + Interest + Property Taxes); this is the entry in the fourth column of Table 2. The entry in the last column of Table 1 is (Pretax Profits + Interest - Corporate Taxes - $\text{TAX}_{investor}$)/Assets.

Table A-1:
Weighted Average Marginal Tax Rates

	Average Marginal Tax Rate on		
	Dividends	Accruing Gains	Interest
1959	36.1	5.0	39.2
1960	35.1	4.9	38.4
1961	35.7	4.9	38.1
1962	34.9	4.8	37.9
1963	35.1	4.9	37.8
1964	31.8	4.5	35.9
1965	30.5	4.3	34.1
1966	30.8	4.3	33.8
1967	31.2	4.4	34.1
1968	32.2	4.5	37.1
1969	27.7	5.7	36.0
1970	26.7	5.5	34.0
1971	26.3	5.5	33.8
1972	25.6	5.4	34.2
1973	25.3	5.4	33.9
1974	24.8	5.5	33.9
1975	24.1	5.3	33.6
1976	25.2	5.5	34.5
1977	25.9	5.7	35.2
1978	25.0	5.5	34.6
1979	26.2	4.2	33.7
1980	26.9	4.2	33.3
1981	26.6	4.2	33.5
1982	20.8	3.5	34.1
1983	20.2	3.4	32.9
1984	18.3	3.2	32.9
1985	17.7	3.2	32.8
1986	18.1	3.2	32.5
1987	17.0	4.5	28.3
1988	14.7	4.6	24.6
1989	14.9	4.7	23.9
1990	14.3	4.6	23.6
1991	14.9	4.6	24.0
1992	15.2	4.7	22.8
1993	16.2	4.7	22.8
1994	15.9	4.7	22.0
1995	16.0	4.8	21.6
1996	15.9	4.8	20.9

Notes: Entries describe elements that were used in calculating the investor-level tax burden on corporate capital income in the United States. See appendix for further discussion.

Table A-2:
Components of NFC Capital Gains

| | | Inflationary Gain on: | |
	Retained Earnings	Debt	Tangible Assets
1959	12.9	3.6	0.4
1960	10.6	9.2	1.1
1961	10.1	5.8	0.8
1962	12.9	7.9	1.2
1963	14.4	9.1	1.5
1964	18.4	9.3	1.6
1965	23.4	14.6	2.7
1966	25.1	24.5	4.4
1967	22.2	26.6	4.8
1968	21.4	38.8	6.6
1969	18.4	46.2	8.4
1970	12.5	52.8	9.6
1971	18.6	55.6	10.4
1972	24.7	53.6	10.2
1973	37.3	93.4	18.8
1974	45.3	162.8	31.6
1975	43.6	139.8	20.6
1976	56.3	113.3	15.5
1977	67.2	151.3	22.9
1978	80.0	191.8	29.3
1979	87.8	247.0	36.8
1980	69.2	323.3	42.4
1981	64.2	313.4	37.8
1982	34.2	218.4	26.9
1983	33.8	169.4	21.8
1984	49.5	159.4	21.9
1985	25.4	164.5	24.5
1986	2.0	126.3	23.8
1987	45.5	168.4	32.3
1988	79.4	216.5	44.5
1989	34.8	227.7	56.4
1990	23.3	284.5	66.3
1991	8.2	207.4	45.9
1992	33.2	154.6	30.3
1993	47.7	143.3	31.4
1994	81.0	139.6	26.6
1995	86.6	151.3	30.1
1996	90.1	114.9	22.7

Notes: Entries describe elements that were used in calculating the investor-level tax burden on corporate capital income in the United States. See appendix for further discussion.

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