



Taxing Capital

By Alex Brill

The U.S. income tax system, which collected \$1.5 trillion in receipts in fiscal year 2007, has, as its principal base, wage income plus the income from capital.¹ To understand how the tax code affects the macro economy, one must understand how taxing wages affects work and how taxing capital affects investment. This Tax Policy Outlook focuses on the latter: the taxation of income derived from business capital. It describes the standard economic measurement of capital taxation, recent changes in the tax treatment of capital, and future changes that could eliminate the distortions caused by the current system. I conclude that, first, the effect of taxes on capital is not simply driven by the statutory tax rates that are readily observed in the tax code; second, the real tax rate on capital varies considerably across asset types; and third, the current tax code both discourages capital accumulation and distorts the allocation of capital considerably. Should policymakers seriously attempt to achieve tax reform in the next few years, the opportunity to remove economic impediments in the tax code will depend, in part, on achieving a consensus on the effects of the current system on growth. The greatest opportunity for increased growth from changing the tax code lies with reforming the taxation of capital.

How the U.S. tax code treats capital is a critical question for economists concerned about economic growth. The two relevant issues are the effects of taxation on the size of the capital stock and the allocation of capital within the economy. Distortions caused by unequal tax treatment of capital lead to misallocation of resources, and the overall tax burden on capital has significantly suppressed investment.²

In the most common economic growth model, production—or economic output—is a function of labor and capital.³ More output (that is, economic growth) requires more input (more labor, more capital, or both) or increases in productivity from technological advances. In this growth model of the economy, taxes affect the supply of labor or capital or discourage innovation, technology, or productivity enhancements.

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Capital taxes—including ordinary individual income taxes, capital gains taxes, dividend taxes, and corporate income taxes—unambiguously raise the cost of capital. While the effect of a change in the price of capital on the supply of capital is an empirical question, the emerging consensus among economists is that the response to the change in price is quite large. For example, attempts to stimulate investment in 2002 and 2003 by allowing faster depreciation of equipment have been estimated to have increased output 0.1 to 0.2 percentage points and created 100,000 to 200,000 jobs.⁴ In addition, as global capital flows increase and money moves with greater ease across borders, the allocation of capital is becoming increasingly sensitive to differences in tax structures around the world.⁵ A consensus has formed from the empirical evidence suggesting that a 1 percent decrease in the cost of capital for business equipment increases equipment investment between 0.5 and 1 percent.⁶

Measuring the Tax on Capital

The taxation of capital under an income tax is indirect. It is the *income* that is derived from the use of capital that is taxed, not the capital itself. As a result, measuring the tax on capital is indirect as well. The most common measurement is the effective marginal tax rate (EMTR), a concept introduced by Harvard economist Dale Jorgenson.⁷ Another approach, focusing on the difference between actual tax collections and projected collections under a consumption tax, has been developed by Joel B. Slemrod, Laura Kalambokidis, and Roger H. Gordon.⁸ In addition, average—as opposed to marginal—tax burdens on capital income have been shown to affect investment as well. Michael P. Devereux and Rachel Griffith consider the effect of taxation on cross-border investment and find that firms' investment decisions in Europe are affected by average tax burdens.⁹ Steven M. Fazzari, R. Glenn Hubbard, and Bruce C. Petersen emphasize how average tax burdens affect investment for firms that face internal-financing costs lower than their external costs.¹⁰ This *Outlook* focuses on the traditional EMTR analysis, while relaxing assumptions about risk and uncertainty in capital investments to demonstrate the versatility of this framework.

The EMTR is the expected future return from an investment in a capital project that must be paid in taxes. For example, if a corporation makes an investment in a machine or a factory that generates a pretax rate of return of 10 percent and an after-tax return of 6.5 percent, then the effective tax rate is the wedge between these two rates of return, 3.5 percentage points or 35 percent. The calculation compares the present value of all expected pretax income to the present value of all expected tax. Because these calculations generally involve multiple years of income and tax, the timing of the tax payments is important; all future tax payments must be discounted to the present.

Theoretically, under an income tax, the taxpayer calculates taxable income as gross revenue minus costs, where costs include the economic depreciation of the machine used to produce the revenue. For example, a corporation in the snow removal business would subtract from revenues ordinary expenses (including labor costs) and the decline in value (economic depreciation) of the snowplows. If the tax code properly measures income and depreciation, then the EMTR is equal to the statutory tax rate. For many reasons, however, the tax code does not accurately measure income

or depreciation. As a result, different assets are taxed differently, as are the different financing structures underlying investments.

The Basic Current Structure

Capital is taxed differently depending on the organizational form (for example, corporate or noncorporate), the difference in present value between the tax depreciation allowance rules and real (“economic”) depreciation, the method of financing (for example, debt or equity), and firm size (small firms are allowed to expense or immediately write off their capital investments rather than depreciate them over time).

Corporate versus Noncorporate. Corporations are taxed differently depending on their organizational form. In particular, there is an important tax distinction between C-corporations and S-corporations (or “pass-through entities”). Income earned by C-corporations is subject to the corporate income tax. Income earned by the owners of C-corporations (shareholders) is also taxed when it is received as a dividend, or as a capital gain, as in the case of retained income. Conversely, partnerships, sole proprietorships, and S-corporations are not subject to the corporate income tax. The income of these businesses is taxed only as personal income to their shareholders. As a result, C-corporations are taxed twice (corporate and individual) while other businesses are taxed once. Not surprisingly, the EMTR for capital income received by C-corporations is notably higher than for pass-through entities.

Depreciation. Frequently, depreciation schedules for tax purposes allow faster write-offs than actual economic depreciation. These additional deductions reduce the tax burden associated with the income from that investment in the early years. This results in the effective tax rate being less than the statutory rate. In other cases, tax depreciation schedules are too long.

Debt versus Equity. The tax code allows businesses to deduct interest expenses. If the tax rate is 35 percent and a company pays \$100 in interest, the company deducts that \$100 from its income, thereby saving \$35 in taxes and lowering the net cost of the interest payment to \$65. No equivalent deduction is afforded a taxpayer that finances an investment with equity. As a result, debt-financed investments incur less tax and face a lower

EMTR. In fact, as shown in table 1, a purely debt-financed investment faces a negative tax rate—that is, a tax subsidy.

Other factors and assumptions that impact the effective tax rate calculation include investment tax credits, personal income taxes, state and local taxes, nominal interest rates, and inflation.

Estimating Effective Marginal Tax Rates

A number of academic economists and federal agencies have undertaken studies to measure the effective tax rates on capital.¹¹ In the most comprehensive study in recent years, the Congressional Budget Office (CBO) found that debt-financed business assets face a negative effective tax rate (that is, they generate corporate tax refunds), equity-financed corporate assets face an average effective tax rate of 36.1 percent, and pass-through entity assets face an average effective tax rate of 20.6 percent.¹²

Within the corporate sector, effective tax rates vary significantly across asset classes. Among the forty-nine asset classes studied by the CBO, the effective tax rates for corporate investment (assuming a historical blend of debt and equity financing) vary from 36.9 percent (computers and peripherals) to 9.2 percent (petroleum and natural-gas structures). The average EMTR for corporate investment is 26.3 percent. For pass-through entity investments, the average EMTR for investment is 20.4 percent. Within a given asset type, the EMTR on that capital varies wildly as well. For example, industrial equipment in the pass-through sector faces a 12.7 percent EMTR, equity-financed corporate sector industrial equipment faces a 28.4 percent EMTR, and debt-financed corporate sector industrial equipment faces an EMTR of -19.2 percent.

A similar analysis was released by the Treasury Department in 2007.¹³ Table 1, compiled from the CBO and Treasury Department reports, summarizes how EMTRs vary. Given the plethora of assumptions and variables underlying these calculations, the results are quite similar.

Details on the CBO’s methodology can be found in the CBO paper, but there are four major factors underlying the calculations: first, tax treatment of various

TABLE 1
EMTR ON CAPITAL INCOME AND TAX RATE UNIFORMITY

Effective Marginal Tax Rates	CBO (2005) (percentage)	Treasury (2007) (percentage)
Overall	13.8	17.3
Business	24.2	25.5
Corporate	26.3	29.4
Debt-financed	-6.4	-2.2
Equity-financed	36.1	39.7
Noncorporate	20.6	20.0
Housing		
Tenant-occupied	18.2	—
Owner-occupied	-5.1	3.5

SOURCES: Congressional Budget Office, “Taxing Capital Income: Effective Rates and Approaches to Reform” (CBO Paper, Washington, DC, October 2005), available at www.cbo.gov/ftpdocs/67xx/doc6792/10-18-Tax.pdf (accessed January 29, 2008); and U.S. Department of the Treasury, Office of Tax Policy, *Approaches to Improve the Competitiveness of the U.S. Business Tax System for the 21st Century* (December 20, 2007), available at www.treas.gov/press/releases/reports/hp749_approachesstudy.pdf (accessed January 29, 2008).

sources of income; second, distribution of capital across business structures (C-corporations and pass-throughs); third, distribution of capital across the economy; and fourth, the financing of capital investment (debt versus capital). The results from this analysis lead to three initial observations. First, the average EMTR on capital income is almost always lower than the statutory tax rate, which is 35 percent for corporations. Second, there is significant variation in tax rates across asset type. Finally, tax rates vary wildly depending on the financing structure of a new investment, with negative tax rates for debt-financed investment.

The differential treatment of corporate and noncorporate income has significant economic effects, as assets are widely distributed across business type. Furthermore, different asset types face different effective tax rates because tax depreciation rules do not uniformly relate to an asset’s economic depreciation. Table 2, based on the CBO’s work, illustrates the wide variation in effective tax rates across asset type. Inventories, computers and peripherals, and manufacturing buildings face effective tax rates above 30 percent, while mining structures and petroleum and natural-gas structures face effective tax rates near 10 percent.

The Effects of Risk and Profits on EMTR

The standard models used to construct EMTRs do not consider the risk level of capital investment. In reality,

TABLE 2
AVERAGE EFFECTIVE TAX RATES BY ASSET TYPE

Asset Type	Effective Marginal Tax Rate (percentage)
Computers and peripherals	36.9
Inventories	34.4
Manufacturing buildings	32.2
Land	31.0
Software	29.1
Hospitals and special care	28.4
Electric transmission and distribution	24.9
Farm tractors	22.7
Mining and oilfield machinery	21.9
Medical equipment and instruments	20.4
Railroads	20.1
Light trucks (including utility vehicles)	18.2
Communications equipment	17.8
Construction tractors	17.4
General industrial equipment	17.3
Communication structures	17.0
Construction machinery	16.7
Ships and boats	16.5
Mining structures	9.5
Petroleum and natural gas	9.2

SOURCE: Congressional Budget Office, "Computing Effective Tax Rates on Capital Income" (background paper, Washington, DC, December 2006), available at www.cbo.gov/ftpdocs/76xx/doc7698/12-18-TaxRates.pdf (accessed January 29, 2008).

of course, the rate of return on capital investments can vary wildly. Some investments are failures, some generate a modest rate of return, and occasionally an investment will be a blockbuster. Furthermore, depending on how a given piece of capital is used, its rates of return can vary greatly. If a lawyer buys a laptop and uses it to help settle a \$1 million case, that laptop has a higher rate of return than if a paleontologist uses the laptop to write a textbook.

However, the reality of risks and real profits associated with capital income does not invalidate the results from the standard model. While the return actually realized on an investment may *ex post* be significantly higher or lower than the hurdle rate required by the investor initially, the decision to invest depends on the expected return *ex ante*. Therefore, modifying this framework to incorporate riskiness and profits does not change the results. While an investment that realizes a rate of return that is above normal will result in additional tax payments, that fact does not alter the *ex ante*

EMTR as long as the tax code treats profits and losses symmetrically.

What Has Happened to the EMTR Recently?

During the past six years, Congress enacted a series of laws that altered the effective tax rate on various types and forms of capital. Not only do these changes significantly affect business tax liabilities, but they also alter the investment decisions businesses make.

Changes ranged from broad but temporary stimulus to efforts targeted at small and medium business and asset-specific tax treatment changes.

These changes matter for industry trade groups, corporate CFOs, and shareholders because strategies for business growth can be significantly altered by the tax structure. The tax code generates preferences for certain tax-motivated activities and places restrictions on others via tax-induced disincentives. Increasingly, decisions among capital investment opportunities or about where to locate investments are affected by the tax treatment of capital.

Among the dozens of tax bills and hundreds of tax provisions enacted into law in recent years, a subset has had a direct impact on the taxation of capital. Table 3 highlights the largest of those changes.

A number of smaller, targeted changes affecting the effective tax rate on specific assets have occurred as well. For example, racetrack complexes, self-created musical works, and qualified cellulosic ethanol plants have had their tax treatment changed favorably, reducing their EMTR.

Aggregating across business types and financing types, effective tax rates on capital were the lowest in 2004, due primarily to the temporary accelerated-depreciation provision that expired at the end of that year (and low interest rates). Tax rates on capital today remain lower than they were prior to the tax cuts that began in 2001, particularly for small businesses that are allowed to expense much of their investment. Tax rates on capital are the highest for larger corporations in the service industry, little changed from the 1990s.

TABLE 3
MAJOR LEGISLATIVE CHANGES TO EFFECTIVE TAXATION OF CAPITAL INCOME, 2001–2007

2001, 2003	Lower Marginal Rates on Income; Estate Tax Repeal	Ordinary income tax rates were lowered in 2001 and 2003, which affected businesses organized as pass-through entities. In addition, estate tax law changes have reduced the tax rate on estates and increased the exemption amount. These changes are temporary, however, and expire after 2010.
2003, 2007	Section 179 Small Business Expensing	The limit on the total amount a small business can immediately expense (write off) was raised from \$25,000 to \$100,000, and the phaseout of this provision was raised to include all businesses with investments of less than \$400,000 in a given year. In 2007, the limit was raised to \$125,000, and the phaseout threshold was raised to \$500,000. The higher limit and threshold expire after 2010.
2002, 2003	Bonus/Accelerated Depreciation	In 2002, Congress enacted legislation intended to stimulate business investment by allowing assets with depreciation lives of less than twenty years to immediately expense 30 percent of the cost in addition to the ordinary depreciation schedule. This rule applied for investments made after September 10, 2001, and before September 11, 2004. In 2003, the bonus depreciation provision was increased to 50 percent and extended through the end of 2004.
2003, 2006	15 Percent Tax on Dividends and Capital Gains	The tax rate on dividends and capital gains was reduced to 15 percent. Previously, dividends had been taxed as ordinary income, and long-term capital gains had been taxed at 20 percent. These provisions were originally enacted through 2008, and in 2006 they were extended through 2010.
2004	Section 199 Manufacturing Rate Cut	The rate cut on “production income” (broadly defined) was phased-in from 35 to 32 percent. The lower rate is available for corporate and noncorporate income.

SOURCE: Compiled by the author.

Where Do We Stand among Our Trading Partners?

As global capital markets grow and cross-border capital mobility increases, how the U.S. tax code compares to those of its neighbors and trading partners is increasingly important. According to the Treasury Department, the statutory U.S. corporate tax rate, currently 35 percent, is the second highest in the industrialized world (behind Japan). The average statutory corporate tax rate in Organisation for Economic Co-operation and Development (OECD) countries is 31 percent.¹⁴ But, as discussed earlier, depreciation rules are an important component for determining the effective tax rate on capital income. In fact, by combining depreciation rules and statutory corporate tax rates of OECD countries, one can calculate EMTRs across countries.

The CBO undertook this analysis and determined that for equity-financed capital investments of machinery, the U.S. EMTR is the fourth highest among the set

including the United States and OECD countries, and for equity-financed capital investments of industrial structures, the United States has the second-highest EMTR. Although the dispersion of EMTRs across OECD countries is less than the variance of statutory rates, the EMTR in the United States on machinery is more than twice as high as in Ireland. In addition, because most countries employ some form of accelerated depreciation for investment, the EMTR tends to be lower than the statutory tax rates in foreign countries as well as in the United States.¹⁵

What Does the Future Hold?

There are a variety of policy options to consider with regard to reforming the tax treatment of business capital. A modest reform would focus simply on reducing the distortions across asset classes caused by depreciation schedules that are inconsistently related to economic depreciation. A comprehensive review and

increased regulatory flexibility with regard to establishing proper depreciation schedules could result in a budget-neutral reform that levels the playing field across asset type.

Allowing owners of capital to immediately expense their purchases while disallowing the tax deduction for interest expenses would yield a zero tax rate on new capital at the business level. Such a policy would eliminate the disincentive for capital investment and eliminate distortions across asset classes.

Finally, reducing the corporate tax rate would also reduce the EMTR on business capital as well as reducing the tax distortion between C-corporations and pass-through entities. A large reduction in the corporate tax rate would also significantly affect the flow of capital globally and reduce the distortion between debt and equity.

These three reforms—reform of the depreciation schedule, accelerated depreciation, and corporate rate reduction—would reduce the EMTR and thereby encourage net additional capital investment. Under current law, however, tax rates on capital are scheduled to rise, not fall. The lower tax rate on capital gains and dividends, the lower ordinary income tax rates, and the repeal of the estate tax all expire at the end of 2010. This “naturally occurring” tax increase combined with new priorities of the Democrat-controlled Congress will probably lead to considerable shifts in taxation of capital income in the next few years.

First, current budget rules (“pay-as-you-go”) and a strong desire for budget discipline in Congress may lead the tax-writing committees to level the playing field by increasing effective tax rates on those types of capital now more favorably taxed without using the additional projected revenue to reduce EMTR on other forms of business capital. The House has already voted to raise taxes on new investments in energy, which is one of the more lightly taxed types of capital investment. While increased uniformity in tax rates would improve efficiency by reducing the distortionary incentives to misallocate capital, a higher average tax rate on capital will further discourage capital accumulation in general.

Second, the ownership of capital is highly concentrated among the wealthiest Americans. To the extent that Congress seeks to increase the progressivity of the tax code, raising capital taxes—while harmful for capital accumulation—is one such targeted tool. In fact, if progressivity calculations emphasize the

tax burden of taxpayers in the top 0.1 percent, the only practical way to increase the progressivity of the tax code for those taxpayers is to increase the tax on capital—their primary source of income.

Third, as the awareness of global competitive pressures increases in Congress, the likelihood of a reduction in corporate tax rates (although perhaps not overall tax *burdens*) will rise. In fact, recently introduced legislation by Ways and Means Committee chairman Charles Rangel (D-N.Y.) proposes reducing the top corporate tax rate from 35 to 30.5 percent while eliminating the preferential rate that applies to manufacturing income. These two steps would clearly lower the EMTR on capital and reduce a tax-induced distortion between types of production (services versus manufacturing). Other provisions of the Rangel bill, however, would raise the EMTR on capital. For example, the tax rate on inventories, already one of the most highly taxed asset types, would rise. The increase in the top personal income tax rate would increase EMTR generally.

Finally, it is important to note the consequences of tax policy uncertainty. While tax rates are scheduled to rise, it is possible that Congress will vote to make some of the Bush tax reductions permanent. At the same time, other tax increases and tax cuts are always on the horizon. As such, uncertainty in rates of return caused by the tax code is potentially significant. The use of temporary tax cuts in 2001 and 2003, while a political necessity given the rules of the Senate, created additional uncertainty about future tax rates. This risk could be interpreted as a type of tax itself.

The average tax rate on new capital investment is significantly less than the statutory tax rate, but it is significantly higher than the investment-optimal tax rate of zero. The current tax code imposes a significant tax on business capital, and scheduled changes in the next three years will only raise those EMTRs. Furthermore, the tax rate on new investment varies considerably. Different types of assets are taxed at different rates, different financing structures (debt versus equity financing) can lead to dramatically different EMTRs, and the existence of the corporate rate at 35 percent imposes a significant distortion between C-corporations and pass-through entities.

Significant reforms in this area of the tax code are warranted. The EMTR can be reduced to zero by employing expensing along with the elimination of the deductibility of interest. Further acceleration of

depreciation schedules is another way to reduce the EMTR. Finally, a reduction in the corporate tax rate would also reduce the EMTR and improve the global competitiveness of the United States.

These income tax reforms are all options that exist within the context of the current tax code and that illustrate that there are opportunities for growth enhancing tax reform without attempting the more politically difficult task of adopting a radically different tax structure, such as a value-added tax or a national retail sales tax.

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Notes

1. In reality, the tax code deviates significantly from this principle in a number of ways, notably in that a significant portion of the income earned in the United States is untaxed and there are a number of taxes on consumption.
2. Kevin A. Hassett and R. Glenn Hubbard, "Tax Policy and Business Investment," in *Handbook of Public Economics*, vol. 3, ed. Alan J. Auerbach and Martin S. Feldstein (Amsterdam: Elsevier, 2002), 1293–1343.
3. More elaborate models include additional types of inputs to production, such as land, energy, and different types of labor.
4. Christopher House and Matthew Shapiro, "Temporary Investment Tax Incentives: Theory with Evidence from Bonus Depreciation" (working paper 12514, National Bureau of Economic Research, Cambridge, MA, September 2006), available at www.nber.org/papers/w12514 (accessed January 29, 2008). The reduction in the dividend tax rate in 2003 has been linked to an increase in the number of corporations paying dividends, a significant increase in dividend payments by many firms already paying dividends, and an increase in the number of one-time dividend payments. See Raj Chetty and Emmanuel Saez, "Dividend Taxes and Corporate Behavior: Evidence from the 2003 Dividend Tax Cut," *Quarterly Journal of Economics* 120, no. 3 (2005): 791–833.
5. Rosanne Altshuler, Harry Grubert, and T. Scott Newlon, "Has U.S. Investment Abroad Become More Sensitive to Tax Rates?" (working paper 6383, National Bureau of Economic Research, Cambridge, MA, January 1998), available at www.nber.org/papers/w6383 (accessed January 29, 2008).
6. Kevin A. Hassett and R. Glenn Hubbard, "Tax Policy and Business Investment."
7. Dale Jorgenson, "Capital Theory and Investment Behavior," *American Economic Review* 53 (May 1963): 247–53.
8. Joel Slemrod, "Does the United States Tax Capital Income?" in *Taxing Capital Income*, ed. Henry Aaron, Leonard Burman, and Eugene Steuerle (Washington, DC: Urban Institute Press, 2007), 3–31.
9. Michael P. Devereux and Rachel Griffith, "Taxes and the Location of Production: Evidence from a Panel of U.S. Multinationals," *Journal of Public Economics* 68, no. 3 (June 1998): 335–67.
10. Steven M. Fazzari, Bruce C. Petersen, and R. Glenn Hubbard, "Financing Constraints and Corporate Investment," *Brookings Papers on Economic Activity* 1 (1998): 141–95.
11. U.S. Department of the Treasury, Office of Tax Policy, *Approaches to Improve the Competitiveness of the U.S. Business Tax System for the 21st Century* (December 20, 2007), available at www.treas.gov/press/releases/reports/hp749_approachesstudy.pdf (accessed January 29, 2008); Jane G. Gravelle, *The Economic Effects of Taxing Capital Income* (Cambridge, MA: MIT Press, 1994); Congressional Budget Office (CBO), "Taxing Capital Income: Effective Rates and Approaches to Reform" (CBO Paper, Washington, DC, October 2005), available at www.cbo.gov/ftpdocs/67xx/doc6792/10-18-Tax.pdf (accessed January 29, 2008); and CBO, "Computing Effective Tax Rates on Capital Income" (background paper, Washington, DC, December 2006), available at www.cbo.gov/ftpdocs/76xx/doc7698/12-18-TaxRates.pdf (accessed January 29, 2008).
12. CBO, "Computing Effective Tax Rates on Capital Income."
13. U.S. Department of the Treasury, Office of Tax Policy, *Approaches to Improve the Competitiveness of the U.S. Business Tax System for the 21st Century*.
14. Ibid.
15. CBO, "Taxing Capital Income: Effective Rates and Approaches to Reform."