Options for Corporate Capital Cost Recovery: Tax Rates and Depreciation

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ABSTRACT

The way the US corporate tax code requires capital expenditures to be depreciated is highly distortionary and raises the cost of capital investments. Depreciation—the process of writing off capital purchases over time—has received attention because it is the largest corporate tax expenditure in the United States. Requiring capital assets to be depreciated lowers the return to capital investments, creates disparate effective tax rates on similar activities, and signals that the tax code is open to special-interest tailoring. The tax code is often manipulated by arbitrarily shortening depreciation timelines through accelerated depreciation or bonus expensing. As a solution to the current inequity and inefficiency of depreciation policies, this paper advocates full expensing. Expensing incentivizes investment by allowing businesses to write off all expenditures in the year they occur, resulting in a zero effective tax rate on equity-financed capital.

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The current US tax code is complex, carved up by special interests and full of distortionary tax rates that treat similar activities unequally. Unequal taxation inefficiently distorts consumer and investor decisions, which can be damaging to the economy. These problems are particularly egregious in the tax system that applies to corporate capital investments. This paper will look at how the US tax code currently deals with capital investments, some inefficiencies, and possible alternative solutions.

The tax code requires that most new purchases of capital, such as machines and buildings, be deducted from total revenue over the course of many years—this is called depreciation, or capital cost recovery. Unequal tax rates develop across industries because of disparities in when the tax is paid. A one-dollar investment today can be reduced to as little as 37 cents of real write-off value, diminishing the profitability of investments.[1]

Using IRS data for 11 different industries from 1998 to 2010, we provide individual effective tax rates for each industry (see Appendix). Driven primarily by current depreciation policies, capital investments of Chapter C corporations are taxed unequally at effective rates as high as 36.9 percent and as low as 9.2 percent.[2]

As a solution to the current inequity and inefficiency in depreciation policies, we advocate full expensing. Expensing offers an even ground for capital investments by allowing businesses to write off all expenditures in the year they are purchased, resulting in a zero effective rate on equity-financed capital. A zero effective rate refers to the expected tax rate paid on an investment that breaks even (does not turn a profit). The corporate income tax rate and tax rates on capital gains and dividends are not altered by this proposal. Expensing simplifies

1. Stephen J. Entin, "The Tax Treatment of Capital Assets and Its Effect on Growth: Expensing, Depreciation, and the Concept of Cost Recovery in the Tax System" (Background Paper 67, Tax Foundation, Washington, DC, April 2013), http://taxfoundation.org/sites/taxfoundation.org/files/docs/bp67.pdf.
2. Congressional Budget Office, *Taxing Capital Income: Effective Rates and Approaches to Reform* (Washington, DC, Oct. 2005), http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/67xx/doc6792/10-18-tax.pdf.

the tax code, reduces the ability to gain targeted tax favors, and increases investment. There are some short-run costs associated with expensing that may need to be paid in order to get to a better tax policy, but expensing in the long run is likely to be revenue-neutral or even growth- and revenue-enhancing.[3]

WHY DEPRECIATE ASSETS?

Investments with any capital intensity require purchasing machinery, software, property, or structures. The process of depreciation was first instituted when reporting earnings to shareholders: without depreciation, years with large investment purchases would show negative profits and years with no investments would show high profits, all else being equal. To reduce these swings in reported earnings and convey the company's true position, accountants distribute the cost of each investment over the number of years it will be in service. This is called depreciation or cost recovery. Accountants depreciate a given asset by deducting a set percentage of an investment each year until the carried balance is zero.[4] This method of depreciation, commonly used in "book accounting," communicates profitability to shareholders but distorts the profitability of capital investments when applied to the tax code.[5]

"Expensing simplifies the tax code, reduces the ability to gain targeted tax favors, and increases investment."

3. Michael Schuyler, "Comparing the Growth and Revenue Effects of Four Proposed Depreciation Systems: Baucus, Camp, Wyden, and Full Expensing" (Fiscal Fact No. 433, Tax Foundation, Washington, DC, June 2014), http://taxfoundation.org/sites/taxfoundation.org/files/docs/FF433.pdf.
4. Depreciation for accounting purposes is most often simple straight-line. However, there are other acceptable practices outlined in the Financial Accounting Standards Board's Accounting Standards Codification of Generally Accepted Accounting Principles (GAAP). Entin, "Tax Treatment of Capital Assets"; Michelle Hanlon, "Testimony of Michelle Hanlon" (United States Senate Committee on Finance, March 6, 2012), http://www.finance.senate.gov/imo/media/doc/Testimony%20of%20Michelle%20Hanlon.pdf.
5. The accounting process for shareholders to show profit and loss is called "book accounting," which is different from accounting for tax purposes. This is an important note because the book effective tax rate that appears to corporate executives and shareholders does not always capture the effects of timing in the true economic sense. See Hanlon, "Testimony of Michelle Hanlon."

This paper will refer to deprecation when applied to the tax code as tax depreciation. Tax depreciation is important because the timing of cost recovery can mean significant differences in how much tax revenue is collected in a given year and over time, due to inflation and the time value of money.[6] Investment decisions are made based on after-tax profitability, which is directly impacted by how the asset is depreciated. The timing of depreciation and its effect on profitability is explored in more detail in the section "Expanding the Case for Expensing." Historically, there have been several tax methods available by which these cost recovery schedules have been calculated.

Straight-line depreciation divides the total cost of the asset by its useful life (where useful life is either estimated or set arbitrarily) and deducts the same yearly amount over the life of the asset. For example, a $1,000 piece of equipment that will be used for five years would be written off 20 percent or $200 in each year for five years. The complicated part of all depreciation methods is determining the "useful" life of the piece of equipment or structure.[7] In the tax code, these depreciation timelines are defined by asset class, grouping similar goods together.[8]

Declining-balance depreciation, known more generally as accelerated depreciation, uses similar asset classes as straight-line depreciation but allows more of the original cost to be deducted up front. In a stylized version of accelerated depreciation, 40 percent of a $1,000 piece of equipment would be deducted in the first year, 40 percent of the remaining balance in the second year, and so on. In the fifth year the remaining cost would be written off.[9]

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6. The term "depreciation" often suggests that defined tax write-offs over time have some necessary link to the useful life of the asset. The term "cost recovery" is often more precise, as it refers unambiguously to recouping the original expenditure. This paper favors the term "depreciation" over "cost recovery" for simplicity; depreciation should be understood as a cost-recovery mechanism.

7. An asset's useful life is difficult to assess because it varies by industry and by business. A piece of equipment could last ten years if used during normal business hours and only four years if used 24 hours a day. The early evolution of asset lives illustrates this difficulty nicely. In a 1920 publication, *Bulletin F: Depreciation and Obsolescence*, the Bureau of Internal Revenue stated, "It is considered impracticable to prescribe fixed, defined rates of depreciation which would be allowable for all property of a given asset or character." David W. Brazell, Lowell Dworin, and Michael Walsh, "A History of Federal Tax Depreciation Policy" (OTA Paper 64, Office of Tax Analysis, Washington, DC, May 1989), 6, http://www.treasury.gov/resource-center/tax-policy/tax-analysis/documents/ota64.pdf.

8. Internal Revenue Service, "How to Depreciate Property," Publication 946, Feb. 2013, Appendix B, http://www.irs.gov/pub/irs-pdf/p946.pdf.

9. Declining-balance depreciation is often called "200-percent depreciation" because it allows double the straight-line equivalent. Depreciation is accelerated when the declining balance becomes more than 100 percent of the straight-line equivalent. See Joint Committee on Taxation (JCT), Senate Committee on Finance, *Background and Present Law Relating to Cost Recovery and Domestic Production Activities* (Washington, DC, March 6, 2012), 20–21, https://www.jct.gov/publications.html?func=startdown&id=4401.

Depreciation can also be accelerated by arbitrarily shortening the depreciation timeline. The term "accelerated depreciation" does not offer great specificity; it refers generally to faster cost recovery than straight-line depreciation with accurate timelines.[10]

DEPRECIATION ALLOWANCES: A BRIEF HISTORY

The debate over how to best define the useful life of an asset began in the mid-1900s. From the corporate income tax's implementation in 1909 through 1942, businesses were allowed to depreciate their assets as they saw fit.[11] In 1954, the government officially recognized the use of accelerated depreciation and continued to use accelerated depreciation until 1962, when a new, more rigid set of guidelines were enacted.[12] Depreciation timelines and asset classes were further crystalized through industry-wide surveys in 1971.[13] The 1981 Economic Recovery Tax Act first strayed from previous depreciation schemes by shortening asset lives with little consideration of the "facts and circumstances" of estimated useful lives.[14]

The most recent major modification to the United States' depreciation guidelines was included in the Tax Reform Act of 1986. The 1986 Act set up two different systems of depreciation: the Modified Accelerated Cost Recovery System (MACRS) and the Alternative Depreciation System (ADS).[15] A majority of assets are depreciated using MACRS, which generally stipulates shorter

10. Depreciation can be accelerated by any number of methods. Bonus depreciation and declining-balance depreciation both change the timing of the write-off within a given useful-life timeframe. Depreciation can also be accelerated by shortening the timeframe or useful life, often arbitrarily.
11. In 1920 the Bureau of Internal Revenue first published *Bulletin F: Depreciation and Obsolescence*, which did not list specific asset lives or depreciation schedules. The bureau asked taxpayers to estimate depreciation timelines based on their own experiences. *Bulletin F* evolved through subsequent revisions, which listed industry average asset lives determined by surveys of industry depreciation. The 1942 publication of *Bulletin F* became the de facto standard for asset lives and remained the standard which auditors used until 1954. Brazell, Dworin, and Walsh, "History of Federal Tax Depreciation Policy," 6–12.
12. The *Depreciation Guidelines and Rules* were adopted in place of *Bulletin F* in July 1962. Brazell, Dworin, and Walsh, "History of Federal Tax Depreciation Policy," 14.
13. These new standards were called "Asset Depreciation Ranges" and were adapted from *Bulletin F* and modified using research from the newly established Office of Industrial Economics. Brazell, Dworin, and Walsh, "History of Federal Tax Depreciation Policy," 18.
14. This new system of tax treatment was titled "the Accelerated Cost Recovery System." Brazell, Dworin, and Walsh, "History of Federal Tax Depreciation Policy," 20.
15. MACRS and ADS were a combination of explicit class lives dictated by Congress and a framework created by the secretary of the Treasury. The secretary was able to modify the class lives until 1988. JCT, *Background and Present Law*, 21.

asset lives and uses accelerated depreciation.[16] ADS is used for assets that are ineligible for MACRS—ADS uses straight-line depreciation with asset lives that are generally longer than those under MACRS.[17]

Accelerated depreciation for tax purposes was originally justified because it more closely mimics declining productivity as equipment ages.[18] Depending on use, maintenance, and environment, two similar pieces of machinery can depreciate at very different rates—compounded by inflation, developing a proper depreciation schedule for every investment is a difficult task. In modern policy debates, accelerated depreciation has most often been used as an investment incentive. This is often the justification provided by policy advocates for "bonus depreciation."

First used in 2002, additional first-year depreciation deductions have been enacted to stimulate investment and the economy.[19] Called "bonus depreciation," this tool allows a onetime deduction of 30 to 100 percent of the initial cost in the year of purchase. These special tax incentives are available for a limited time and often target specific types of investment. Provisions were enacted in 2002, 2003, 2004, 2008, 2009, 2010, and 2012.[20]

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16. MACRS use both 150 percent and 200 percent declining-balance accelerated depreciation. Ibid., 22.

17. ADS is required for foreign property holdings and some tax-exempt property. ADS is available to any taxpayer in any class of property. When given the option (which is the case for almost all types of property), businesses tend to use MACRS because it offers accelerated depreciation. Ibid., 24. Also, a list of asset classes and depreciation schedules can be found in IRS, "How to Depreciate Property," Appendix A.

18. Brazell, Dworin, and Walsh, "History of Federal Tax Depreciation Policy," 12.

19. The Job Creation and Worker Assistance Act of 2002 was the first instance of bonus depreciation. During the passage of the Jobs and Growth Tax Relief Reconciliation Act of 2003, Congress explained the rationale for bonus depreciation as "to spur an economic recovery." See JCT, *Background and Present Law*, 25.

20. See Job Creation and Worker Assistance Act of 2002, Pub. L. No. 107-147, 116 Stat. 21 (2002); Jobs and Growth Tax Relief Reconciliation Act of 2003, Pub. L. No. 108-27, 117 Stat. 752 (2003); American Jobs Creation Act of 2004, Pub. L. No. 108-357, 118 Stat. 1418 (2004); Economic Stimulus Act of 2008, Pub. L. No. 110-185, 122 Stat. 613 (2008); American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009); Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, Pub. L. No. 111-312, 124 Stat. 3296 (2010); American Taxpayer Relief Act of 2012, Pub. L. No. 112-240, 126 Stat. 2313 (2013). Each of these pieces of legislation offered some level of bonus depreciation on specific types of assets. Each law's stipulations are multifaceted, applying to several different types of property for different lengths of time, both retroactively and into the future. For a comprehensive summary of each law, see JCT, *Background and Present Law*, 25–26. For the 2012 law, see "Fiscal Cliff Legislation Extends 50% Bonus Depreciation and Leasing Provisions," *Ernst and Young Tax Guide 2013—Tax Updates*, accessed December 20, 2013, http://www.ey.com/US/en/Services/Tax/EY-Tax-Guide-2013---Tax-update--Fiscal-cliff-legislation-extends-50--bonus-depreciation-and-leasing-provisions.

Accelerated depreciation, including bonus depreciation, has received attention because it is the largest corporate tax expenditure.[21] The Government Accountability Office (GAO) estimated that accelerated depreciation of machinery and equipment reduced taxes by $76.1 billion in 2011, an estimated 42 percent of total corporate tax revenue.[22] The perceived size of the expenditure has made depreciation a much-discussed candidate for tax reform, with various advocates arguing for manipulating it in order to lower the statutory corporate tax rate, increase federal revenue, or further stimulate investment.[23]

DEPRECIATION TODAY

Two types of reforms to the depreciation system have been proposed in the tax literature: (1) change the timing of depreciation schedules and (2) allow full expensing. Changing depreciation timing through lengthening schedules, moving to straight-line, or some other means of slowing accelerated depreciation would, all else being equal, increase tax revenue. Expensing allows all companies to write off the full cost of their investment in the year purchased, lowering the effective corporate tax rate and benefiting investment. It is worth noting that some proposals to change the timing of depreciation attempt to remain revenue neutral by simultaneously calling for lower statutory corporate tax rates. The projected revenue increases from depreciating assets over a longer period of time are used to offset projected revenue losses from lower statutory corporate tax rates.

On its face, eliminating accelerated depreciation for a straight-line method seems simple. Complications arise when determining on what schedule assets should be depreciated. One example from tax economist Jane Gravelle analyzes a switch of all assets from the MACRS to the longer, straight-line depreciation schedules of the ADS. In exchange for the revenue increases from

21. There is some discussion regarding the definition of tax expenditures. For more, see Jason J. Fichtner and Jacob Feldman, "When Are Tax Expenditures Really Spending?" (Working Paper No. 11-45, Mercatus Center at George Mason University, Arlington, VA, Nov. 2011), http://mercatus.org/publication/when-are-tax-expenditures-really-spending.

22. Government Accountability Office, *Corporate Tax Expenditures: Information on Estimating Revenue Losses and Related Federal Spending Programs* (Washington, DC, March 2013), 11, http://www.gao.gov/assets/660/653120.pdf.

23. Jane G. Gravelle, "Reducing Depreciation Allowances to Finance a Lower Corporate Tax Rate," *National Tax Journal* (December 2011), http://ntj.tax.org/wwtax/ntjrec.nsf/009a9a91c225e83d852567ed006212d8/7b58eba2f399e38d8525796800535598/$FILE/A07_Gravelle.pdf; Congressional Budget Office, *Reducing the Deficit: Spending and Revenue Options* (Washington, DC, March 2011) 180–81, http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/120xx/doc12085/03-10-reducingthedeficit.pdf; JCT, *Background and Present Law*, 25.

slower depreciation, Gravelle found that revenue-neutral tax reform could be achieved by cutting the statutory corporate tax rate by, at most, 4.7 percentage points—a new corporate tax rate of 30.3 percent. However, the 4.7 percent shrinks to 1.6 percent when the forecasting horizon is expanded beyond the typical 10 years.[24] The time horizon is important because depreciation policy just shifts the timing of taxes paid. When depreciation schedules are lengthened (moving tax payments forward in time), inflation and time discounts on money result in larger tax collections.

A more modest proposal to slow depreciation was put forward by the Congressional Budget Office (CBO).[25] The CBO explains that most rates of depreciation were calculated in 1986, assuming 5 percent inflation. However, over the next decade the CBO predicts 2.3 percent inflation, which skews the current depreciation timelines, making the deduction more valuable and lowering real federal revenues. The proposal extends each asset class's life, but leaves the methods of declining balance depreciation the same.[26] By extending the period for depreciation, the CBO proposal attempts to bring the effective tax rates for equipment and structures into parity by more accurately matching tax timelines and useful lives.[27]

The second, major reform proposal is immediate cost recovery, or full expensing. Expensing allows businesses to deduct the full cost of a new investment from their taxable income in the year it was purchased. One might think of full expensing as enacting a permanent, 100 percent bonus depreciation. Expensing capital costs is similar to the current tax treatment of an investment in labor. Just as training costs are deductible from taxable corporate income,

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24. The importance of the time horizon is due to the nature of accelerated and straight-line depreciation. Accelerated depreciation allows larger deductions early in the asset's life compared to straight-line. This means that projected savings will be larger in the five- or ten-year budget window when accelerated depreciation would have allowed larger deductions. At the end of the asset's life straight-line allows larger deductions relative to the accelerated schedule, thus balancing out some of the earlier revenue gains. The phenomenon is more prominent in classes that have longer lives. Gravelle, "Reducing Depreciation Allowances."

25. Jane Gravelle also analyzed the budget effects of the CBO proposal in "Reducing Depreciation Allowances." The effect on the statutory tax rate was smaller than the ADS proposal.

26. Depreciation lifetimes are currently 3, 5, 7, 10, 15, or 20 years. The CBO proposal would raise the lifetimes to 4, 8, 11, 20, 30, or 39 (most structures would be unaffected by this option). CBO, *Reducing the Deficit*, 180.

27. CBO, *Reducing the Deficit*, 180–81. The CBO proposal is only a temporary fix because tax rates would no longer be in parity when inflation changes in the future. We could imagine a system where depreciation schedules were indexed for inflation, but this would prove to be a complex administrative task. The 2.3 percent inflation rate from the consumer price index is from CBO, *The Budget and Economic Outlook: Fiscal Years 2013 to 2023* (Washington, DC, Feb. 2013), 5, http://www.cbo.gov/sites/default/files/cbofiles/attachments/43907-BudgetOutlook.pdf.

full expensing would deduct outlays for equipment from taxable income. Expensing lowers taxes on new capital investments to zero, simplifies the tax code, and treats all types of investment similarly.

EXPANDING THE CASE FOR EXPENSING

Although expensing does not lower the statutory corporate tax rate, it does lower the effective rate. Expensing eliminates corporate taxes specific to capital investments, but it does not change taxes on capital gains, dividends, interest, or general corporate income. Under the current system of depreciation, tax economist Stephen Entin illustrates the implicit tax on investments by showing how the present value of the tax write-off is reduced. If a one-dollar investment is expensed immediately, the business receives one full dollar in tax write-off. In the case of a one-dollar investment being depreciated over 39 years (as some structures are), assuming 3 percent inflation, that one dollar would receive a write-off worth only 37 cents in present value. This example shows that the tax requirement to depreciate investments over time also diminishes the value of the write-off. The decrease in value is felt disproportionately on investments that have long useful lives and is compounded by uncertainty stemming from unknown long-run expectations about inflation.[28]

If a business were forced to move from expensing to depreciation, there would be a similar effect to the previously described decrease in the present value write-off. Relative to expensing, depreciation requires accelerated tax payments. A business has not made a profit until revenue exceeds costs. When businesses are required to pay taxes before they turn a profit, government essentially secures an interest-free loan by receiving tax payments on profit not yet earned. By eliminating complex depreciation systems, expensing decreases the effective rate of taxation on capital to zero because there is no time over which the deduction can lose value.[29]

Expensing is an investment incentive for new capital. Unlike an across-the-board tax rate reduction, expensing lowers the taxes paid on future investments rather than on all profits earned from new and old capital. A zero effective rate on capital increases the after-tax rate of return on new investments, making new investments more attractive under expensing. [30]

28. Entin, "Tax Treatment of Capital Assets," 10–11.
29. Ibid., 12.
30. For a full discussion of how the future value of depreciation write-offs alter the after-tax returns on investment, see ibid., 10–11.

To fully realize the goal of a flat zero rate on all capital investments, we must acknowledge the disproportionate tax rates of debt- and equity-financed investment. Although this paper will not tackle the issue of interest deductions, given the broader theme of a less distortionary tax code, the issue merits a brief discussion. Effective tax rates for debt- and equity-financed capital are −6.4 and 36.1 percent, respectively, as calculated in a 2005 CBO paper. The same paper estimates that full expensing would result in an effective rate of −87.5 percent for debt-financed investments and a zero percent rate for equity-financed capital.[31] This case illustrates the strong incentives for debt-financed investment that currently exist under the US tax regime.

Depending on how the tax base is defined, a properly neutral tax treatment of interest should allow all interest to be deducted, if interest is taxable, or no interest to be deducted if interest isn't considered taxable as income.[32] Any future comprehensive tax reform will have to address the role taxation of interest and interest deductions should play in the tax code.

It should also be recognized that under current depreciation policies, even within an industry, there is a gap in effective tax rates between tangible and intangible investments and between different types of equipment and structures.[33] The tax code treats intangible assets in many different,

"Any future comprehensive tax reform will have to address the role taxation of interest and interest deductions should play in the tax code."

31. The cited effective rates under expensing also include removing contribution, eligibility, and withdrawal restrictions on retirement accounts. The CBO's full analysis also removes interest deductions to get a zero effective rate on both debt- and equity-financed investment. CBO, *Taxing Capital Income: Effective Rates and Approaches to Reform* (Washington, DC, October 2005), http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/67xx/doc6792/10-18-tax.pdf.
32. Curtis S. Dubay, "The Proper Tax Treatment of Interest" (Backgrounder No. 2868, Heritage Foundation, Washington, DC, Feb. 19, 2014), http://thf_media.s3.amazonaws.com/2014/pdf/BG2868.pdf.
33. James Mackie estimates that intangibles have an effective rate of 4.4 percent, compared to 30.5 and 38.8 rates for equipment and structures, respectively. James B. Mackie, "Unfinished Business of the 1986 Tax Reform Act: An Effective Tax Rate Analysis of Current Issues in the Taxation of Capital Income," *National Tax Journal* 55, no. 2 (June 2002): 310, http://www.jstor.org/stable/41789613.

seemingly unequal ways. Intangible assets consist of a variety of nonphysical goods: patents, copyrights, brand names, databases, and labor. In many cases, some intangible assets are immediately expensed.[34] For example, imagine a business pays an employee to compile a valuable databank of searchable information. The employee's wages are expensed, as are most other operating costs. However, the purchase of a new server for the databank must be depreciated over several years. The current tax code favors certain types of investment over others. Expensing treats all investments similarly.

There are large discrepancies in effective tax rates within tangible asset classes. In 2005, the CBO estimated the average effective corporate tax rate on investment was 26.3 percent, ranging from 36.9 percent on computers and peripheries to 9.2 percent on petroleum and natural-gas structures. The variations in tax rates generally result from depreciation rules that differ from the actual useful life:

> The top quartile [of effective rates] consists entirely of computers and peripheral equipment, inventories, manufacturing buildings, and land. The bottom quartile contains 19 different asset types. The major asset types with the lowest rates are mining structures, petroleum and natural-gas structures, railroad equipment, aircraft, specialized industrial machinery, fabricated metal products, ships and boats, and construction machinery.[35]

A shift to full expensing would decrease differences in effective tax rates across industries by treating equipment and buildings—tangible assets—in a manner more similar to intangible assets.

A reform to full expensing would increase the quantity of investments by increasing the after-tax profit of investments. Investments, which carry inherent risk, must be expected to earn back their costs, plus the rate of inflation and a premium for the risk of the investment, or the investor will choose a different option.[36] Depreciation for tax purposes overstates simple pre-tax profit calculations because the present value of the write-off is less than the full cost of the investment.[37] The overstated profits increase taxable income,

34. Entin, "Tax Treatment of Capital Assets," 18.
35. CBO, *Taxing Capital Income*.
36. The CBO estimates inflation over the next decade to be about 2.3 percent. CBO, *Budget and Economic Outlook: Fiscal Years 2013 to 2023*, 5. Steven Entin suggests that competitive investments must earn back 3.0–3.5 percent. Entin, "Tax Treatment of Capital Assets," 9.
37. This is the case for both straight-line and accelerated depreciation, although the effect is largest when cost recovery is longer.

resulting in higher effective tax rates and lower rates of return on investment. However, expensing does not shelter any profit from taxation—all revenue, after the investment is paid off, is taxed at the statutory rate. Expensing allows the full cost of investments to be recovered, inducing more investment and expanding the economy.[38]

Rent-Seeking

Looking beyond the direct economic effects, expensing simplifies the tax code. As discussed above, the effective tax rate on standard corporate investments ranges from 9.2 to 36.9 percent—a 27.7 percentage point spread in the taxation of different asset types primarily driven by uneven depreciation policy. Requiring assets to be depreciated instead of expensed results in winners and losers, allowing the tax code to hurt some industries and help others. The ability to manipulate depreciation for special tax breaks also opens the door to rent-seeking. Congress has the ability to alter the standard MACRS depreciation periods through statutory changes that apply to specific types of assets. A 2012 report by the Joint Committee on Taxation lists 55 separate statutory changes to MACRS depreciation periods.[39] The list details changes to class lives of racehorses, an Alaska natural gas pipeline, green energy property and equipment, magazine circulation expenditures, research and development, and intangible drilling costs.[40] Many of these special provisions give a specific industry or production method a favored tax status for its investments.

Rent-seeking opportunities encourage corporations to spend money lobbying Congress for their own special tax break.[41] Money spent on lobbying does not create anything new or move the economy forward—rent-seeking holds the economy back.[42] Any form of tax depreciation would always be subject to political manipulation. Switching to full expensing eliminates the ability to alter tax depreciation timelines to the advantage of politically favored industries.

To the extent that expensing might simplify the tax code, there are also great benefits to simplifying the tax code by lessening administrative costs. A Laffer Center study on the economic burden of tax code complexities found

38. Entin, "Tax Treatment of Capital Assets," 10–11.
39. JCT, *Background and Present Law*, 47–59.
40. Ibid.
41. Matthew Mitchell, "The Pathology of Privilege: The Economic Consequences of Government Favoritism" (Mercatus Research, Mercatus Center at George Mason University, Arlington, VA, July 2012), 11, 17–18, http://mercatus.org/sites/default/files/The-Pathology-of-Privilege-Final_2.pdf.
42. Seth H. Giertz and Jacob Feldman, "The Costs of Tax Policy Uncertainty and the Need for Tax Reform," special issue, *Tax Notes* 138, no. 8 (Feb. 25, 2013): 951–63.

"If an expensing policy were to be enacted today, there would likely be small revenue losses in the short run and modest revenue increases in the long run."

that US businesses spend 2.94 billion hours complying with the tax code at a cost of $216.2 billion annually. Taxpayers in total spend 30 percent of total income taxes collected to comply with the tax code.[43] According to the Laffer Center, the low-end estimate of a 50 percent reduction in tax code complexity would increase the US annual economic growth rate by 0.45 percentage points over 10 years.[44] Expensing could help move toward reducing complexity and gaining some portion of the noted efficiency gains. Nobel laureate and economics professor Vernon L. Smith notes in a paper titled "Tax Depreciation Policy and Investment Theory" that "perhaps the most valuable advantage of fully expensing capital outlays is that of introducing administrative and clerical simplicity where there has tended to exist great complication."[45]

In an article in *Harvard Business Review*, Allen Auerbach and Dale Jorgenson comment on the efficiency gains from removing the administrative burden of depreciation. They note that businesses could eliminate entire sections of their tax accounting staff if they were no longer required to factor tax depreciation into yearly tax liability reporting and long-run investment decisions.[46] Further evidence points to a preference among chief financial officers (CFOs) for a less complicated tax code. A Duke University/*CFO Magazine* survey in 2011 found that 70 percent of CFOs would give up all tax exemptions for tax code simplicity, even though they may not come out ahead.[47]

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43. This number includes individuals' and businesses' direct outlays, time spent on filing requirements and audits, and IRS administrative costs. It is estimated that businesses spent 2.94 billion hours complying with the tax code in 2008. Arther B. Laffer, Wayne H. Winegarden, and John Childs, *The Economic Burden Caused by Tax Code Complexity* (Austin, TX: Laffer Center, April 2011), 3, http://www.laffercenter.com/wp-content/uploads/2011/06/2011-Laffer-TaxCodeComplexity.pdf.
44. Ibid., 23.
45. Vernon L. Smith, "Tax Depreciation Policy and Investment Theory," *International Economic Review* 4, no. 1 (Jan. 1963).
46. Allen Auerbach and Dale Jorgenson, "Inflation-Proof Depreciation of Assets," *Harvard Business Review* (Sept.–Oct. 1980).
47. Duke/*CFO Magazine* Global Business Outlook Survey (Sept. 2011), http://www.cfosurvey.org/11q4/index.htm.

Revenue Effects of Expensing

Tax policy that allows expensing is more efficient and equitable across different industries—revenue projections are less certain. Stephen Entin lays out a simplified illustration of switching from straight-line depreciation of a $100 piece of equipment over five years to expensing, if the firm purchases one new $100 piece of equipment each year. Old assets will be allowed to depreciate under the old law, while new purchases are expensed. In year 1, the firm gets an additional $80 write-off; in year 2, $60; in year 3, $40; in year 4, $20; and in year 5, the company would be back to its initial $100 yearly write-off. In the short run, expensing would decrease revenues. Over time, revenues would stabilize back to their old levels.[48] Professor of economics and law Alan Auerbach corroborates Entin's assessment, writing, "to allow expensing net of corporate borrowing . . . is likely to have a small net impact on revenue, at least in the long run."[49]

Entin and Auerbach's discussion of revenue does not fully account for the growth effects of full expensing. There would be economic growth from efficiency gains due to simplicity, better return on investment, and reduced rent-seeking as a result of signaling the tax code is less open to exemption tampering. Expensing will make each new asset "more attractive and have a higher rate of return. The capital stock as well as private sector incomes and wages will rise, and revenues will improve."[50] Furthermore, the government has already absorbed much of the transition cost due to past bonus depreciation tax incentives.[51] If an expensing policy were to be enacted today, there would likely be small revenue losses in the short run and modest revenue increases in the long run.[52]

On a static basis, where growth effects are not taken into account, tax expensing will not be revenue-neutral. However, because expensing makes investment relatively more attractive, we can reasonably assume that there will be some growth effects from the tax change. An estimate of the growth effects from full expensing by the Tax Foundation finds that "full expensing would increase GDP by 5.13 percent, lift the capital stock by 15.4 percent, raise wages

48. Entin, "Tax Treatment of Capital Assets," 12.
49. Alan Auerbach, "A Modern Corporate Tax" (Center for American Progress, Hamilton Project, Dec. 2010), http://www.hamiltonproject.org/files/downloads_and_links/FINAL_AuerbachPaper.pdf.
50. Entin, "Tax Treatment of Capital Assets," 13.
51. Because bonus depreciation was extended in 2012 as part of the American Taxpayer Relief Act of 2012, many investments have used the 50 percent deduction. Other previous years have had bonus depreciation allowances of as much as 100 percent. *Ernst and Young Tax Guide 2013*, Dec. 2013.
52. The transition costs arise because of a disruption in tax collection during the first year when the firm writes off the entire investment. If a large portion of past investments has already been fully deducted, there will be less disruption in tax revenue during a transition from depreciation to expensing.

by 4.36 percent, create 885,300 jobs, and boost federal revenue by $121.3 billion" in the long run.[53] Although the tax revenue picture is not easily projected, the static projections of lost revenue are almost certainly incorrect. By lowering the effective tax rate on capital investments, expensing will remove the current tax disadvantage on investment. In relative terms, under a system with full expensing, investors will now find investment (future consumption) more attractive than current consumption. Increased investment has the potential to raise the economic growth rate in both the long and the short run. In other words, the long-run revenue effects depend on how much extra investment is actually induced by moving to a system of full tax expensing and how much tax revenue is then gained at the margin from increased GDP.

DIFFERENCES IN INDUSTRY'S SENSITIVITY TO CHANGES IN DEPRECIATION ALLOWANCES

Using the IRS Statistics of Income (SOI) for active corporations from 1998 to 2010, we are able to estimate which industries would be most sensitive to changes in depreciation (table 1).[54] Our calculations show how removal of existing depreciation policies would affect the tax rates of 11 industries. This is done by removing the current depreciation deduction from total deductions, adding it to total income subject to tax, and applying the effective tax rate. Historical effective tax rates, by industry, are provided in the Appendix.

Although our method of analysis is imprecise due to data limitations, removing depreciation from deductions helps illustrate how each industry's tax status is distorted by the current tax code. Moving to expensing would lower the effective rate; table 1 shows the percentage point change between the current or historic effective rate and the new, higher effective tax rate without depreciation and existing bonus depreciation. The new, higher effective rate shown below is more similar to paying taxes on all income without deducting investment costs. A larger change represents a more sensitive industry.[55]

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53. Projections are from the Tax Foundation's "Taxes and Growth" model with all results presented in steady state. Schuyler, "Growth and Revenue Effects of Four Proposed Depreciation Systems."
54. The IRS SOI Tax Stats are from Internal Revenue Service, "SOI Tax Stats—Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S. These statistics do not include S corporations and other pass-through entities. Pass-through corporations are taxed differently.
55. Industry sensitivity to depreciation reform is measured by examining which industries would experience the largest increase in average effective tax rates if depreciation were removed as a deduction. These same firms would likely have the most to gain from adopting expensing, as well.

TABLE 1. EFFECT OF DEPRECIATION ON EFFECTIVE TAX RATES

Industry	Effective rate without depreciation	Historic effective rate	Difference in percentage points
Mining	28.47%	21.28%	7.19%
Manufacturing	25.29%	19.48%	5.81%
Information	32.18%	27.96%	4.22%
Utilities	33.73%	30.34%	3.39%
Transportation and warehousing	33.50%	31.09%	2.41%
Wholesale trade	31.81%	30.16%	1.65%
Agriculture, forestry, fishing, and hunting	28.40%	27.31%	1.09%
Finance and insurance	31.28%	30.33%	0.96%
Retail trade	32.78%	32.06%	0.72%
Construction	31.52%	30.95%	0.56%
Health care and social assistance	33.44%	32.94%	0.50%

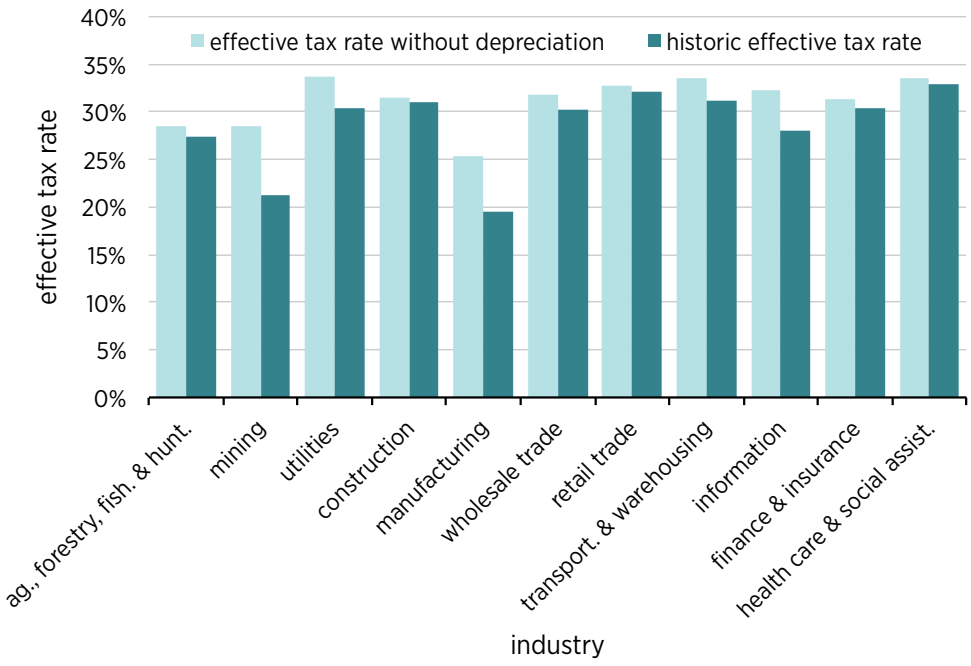
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

The calculation illustrates each industry's sensitivity to the elimination of depreciation and bonus depreciation. Table 1 shows how depreciation and bonus depreciation lowers the effective rate disproportionately across different industries. Because depreciation might be viewed as the consumption of depreciable investments, industries toward the top of table 1 would likely stand to gain much from expensing policies that would reduce the effective tax rate without depreciation. Figure 1 is a graphic representation of the difference between the current effective tax rate and the new effective rate without depreciation.

The pressures that the highly sensitive industries face under current cost recovery rules are mirrored by the CBO's list of assets occupying the bottom quartile of effective rates: mining structures, petroleum and natural-gas structures, railroad equipment, aircraft, specialized industrial machinery, fabricated metal products, ships and boats, and construction machinery.[56] These assets are heavily employed in our top five most sensitive industries (see table 1, above). The low rates on these assets may signal that associated industries are highly motivated to lobby for faster accelerated depreciation.

56. CBO, *Taxing Capital Income*, 7–8.

FIGURE 1. EFFECT OF DEPRECIATION ON EFFECTIVE TAX RATES



Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

Table 2 shows how capital intensive each industry is in terms of depreciation as a percent of income subject to tax. Among some industries, the annual use of depreciation exceeded total income on a yearly basis. Interestingly, industries that are highly capital intensive (see table 2, below) are not necessarily the same industries that are most sensitive to shifts in cost recovery (see table 1, above). The sensitivity ranking is most likely picking up the relative size of the depreciation deduction to all other frequently used deductions and credits across a given industry.

This paper suggests that industries more sensitive to changes in capital cost recovery will likely benefit the most from full expensing. The intersection of the CBO's lowest asset rates and the industries ranked here as highly sensitive indicates which industries have the greatest incentive to lobby for special tax treatment. However, we should not dismiss the industries at the bottom of table 1 as potential beneficiaries of immediate cost recovery, because all industries will benefit from full expensing in absolute terms.

TABLE 2. INDUSTRY RELIANCE ON DEPRECIABLE CAPITAL

Industry	Capital intensive ratio
Utilities	237%
Transportation and warehousing	220%
Agriculture, forestry, fishing, and hunting	168%
Information	138%
Mining	104%
Health care and social assistance	101%
Wholesale trade	71%
Construction	67%
Manufacturing	62%
Retail trade	57%
Finance and insurance	23%

Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

CRITIQUES OF FULL COST RECOVERY

The US corporate tax system is riddled with inefficiencies. Full expensing is just one of many changes that can work to align the tax code with an ideal code that is efficient and equitable. Any proposed change to the tax code will have detractors with well-formed critiques; in the following section we address some common objections to expensing. Full expensing on its own is not a magic tax-code remedy, but it should be part of a larger reform.

The first objection to expensing is that businesses should be arguing for statutory rate reduction instead. In "Where's the Applause? Why Most Corporations Prefer a Lower Rate," Ernst & Young's national director of quantitative economics and statistics, Tom Neubig, gives seven reasons that corporate finance and tax officers prefer lower corporate tax rates to expensing.[57] Neubig's critique assumes a binary choice: either expensing or lower tax rates, but not both. Additionally, J. D. Foster argued in a 2012 *Tax*

57. Tom Neubig's seven reasons are (1) expensing's timing benefit does not show up in the "book effective tax rate," (2) many assets are already fully expensed, (3) corporations fear the removal of interest deductibility, (4) expensing does not reduce taxes on profit—a lower tax rate applies more broadly, (5) not all companies will be able to benefit from expensing immediately, (6) expensing reduces the tax wedge between tangible and intangible assets—a lower statutory rate would reduce the wedge for all corporate decisions, and (7) expensing does not reduce the fear that statutory rates may go up in the future. Tom Neubig, "Where's the Applause? Why Most Corporations Prefer a Lower Rate," *Tax Notes*, April 2006.

Notes article, "The Big Choice for Growth: Lower Tax Rates v. Expensing," that "even capital-intensive firms often appear to prefer lower tax rates to more accelerated depreciation."[58] It is important to note that our case for expensing is not an argument against lower statutory tax rates, although Gravelle's paper on long-run revenue collections may temper enthusiasm for statutory rate reform.[59] An ideal tax code would have low marginal and effective rates across the board. However, in contrast with rate reduction and a focus on tax treatment of capital, expensing brings rates of taxation on all capital goods into parity and increases the return on capital investments.[60] The fact that the effective rate reduction does not appear in book accounting presents a perception problem that may be hard to overcome, but the economic savings are very real. Furthermore, the 2011 Duke/*CFO Magazine* survey showed that executives can look beyond some accounting losses if they think they will come out ahead on other margins.[61] The most salient concern for some businesses is a possible change to the interest deduction, although this is not a critique of full expensing as a policy in its own right.

A second objection to expensing is that existing bonus depreciation policy already failed the litmus test for encouraging investment. Is bonus depreciation an effective tax incentive? The question is important for our discussion because bonus depreciation is not only a form of accelerated depreciation but also a stepping stone to full expensing. Federal Reserve Board economist Jesse Edgerton looked at the investment incentives of accelerated depreciation versus investment tax credits. Edgerton concludes that accelerated depreciation provisions are about half as effective as the investment tax credit. This weak effect is because accelerated depreciation provisions don't show up in the book-effective tax rate. The book-effective tax rate is a key indicator for investors; thus, corporate executives may be less focused on other measures of effective tax rates.[62] Accounting professors David Hulse and Jane Livingstone also find that bonus depreciation in 2001 and 2004 was a weak investment

58. J. D. Foster, "The Big Choice for Growth: Lower Tax Rates v. Expensing," *Tax Notes*, December 17, 2012.
59. Gravelle, "Reducing Depreciation Allowances."
60. J. D. Foster makes a similar argument when he claims that business leaders are more likely to support lower taxes than expensing when given the trade-off. We are not arguing that expensing is the only necessary tax reform. A robust tax reform plan must fit many of these smaller reforms together. J. D. Foster, "The Big Choice for Jobs and Growth: Lower Tax Rates versus Expensing" (Heritage Backgrounder No. 2810, Heritage Foundation, Washington, DC, June 19, 2013).
61. Duke/*CFO Magazine* Global Business Outlook Survey.
62. Jesse Edgerton, "Investment, Accounting, and the Salience of the Corporate Income Tax" (working paper, Oxford University Center for Business Taxation, October 2012).

incentive when compared to investment in years without bonus depreciation.[63] The literature seems to be in general agreement: temporary accelerated and bonus depreciation provisions are middling stimulus measures.[64]

Despite the consensus that bonus depreciation is not a strong investment incentive, expensing has some important differences that may produce different results. Temporary bonus depreciation is intended to shift investment forward rather than induce a higher level of total investment.[65] Furthermore, the temporary provisions are often only 30 or 50 percent. The small effects found in papers examining bonus depreciation might increase significantly if the provision were expanded to 100 percent and made permanent. Expensing removes much of the uncertainty from the current depreciation system, which offers a parade of temporary write-offs and exemptions. Businesses generally make large-scale investment decisions based on long-run economic considerations, not the temporary vicissitudes of congressional tax tampering.[66]

A more stable tax regime will allow businesses to focus on more productive pursuits and plan for the future with tax certainty.[67] As one of us has pointed out in testimony before the US Congress, "Predictable tax policy is essential to long-

"Businesses generally make large-scale investment decisions based on long-run economic considerations, not the temporary vicissitudes of congressional tax tampering."

63. David Hulse and Jane Livingstone, "Incentive Effects of Bonus Depreciation," *Journal of Accounting and Public Policy* 29, no. 6 (2010).
64. Recent research from Eric Zwick and James Mahon from Harvard University finds significant positive effects of changes in accelerated depreciation policy. Most strikingly, they find bonus depreciation raised investment by 17.3 percent on average between 2001 and 2004 and by 29.5 percent between 2008 and 2010. The strong incentive found in this new research may be from the inclusion of small and medium firms, which are more responsive to tax incentives. Eric Zwick and James Mahon, "Do Financial Frictions Amplify Fiscal Policy? Evidence from Business Investment Stimulus" (job market paper, Harvard University, January 7, 2014) http://scholar.harvard.edu/files/zwick/files/stimulus.pdf.
65. Robert E. Hall and Dale W. Jorgenson, "Tax Policy and Investment Behavior," *American Economic Review* 57, no. 3 (June 1967).
66. Hulse and Livingstone, "Incentive Effects of Bonus Depreciation."
67. Kevin A. Hassett and Gilbert E. Metcalf, "Investment with Uncertain Tax Policy: Does Random Tax Policy Discourage Investment?," *Economic Journal* (July 1999), http://sites-final.uclouvain.be/econ/DW/DOCTORALWS2004/bruno/vintage/energy%20tax/hasset%20and%20metcalf.pdf.

term economic growth. Generally, temporary tax provisions should be avoided, especially when trying to correct or rectify a permanent problem. Further, allowing any provisions that favor one group or activity over another not only puts the government in the position of picking winners and losers, but also opens the Congress up to be influenced by those seeking special favors."[68]

A third objection to moving to a full expensing system is uncertainty about the policy's revenue neutrality. Although the evidence above supports the narrative that, in the long run, expensing will not be a net drain on federal revenue, there is always the possibility that tax proposals have unseen revenue effects.[69] This may be an acceptable risk in return for a better tax code. The reduction in rent-seeking opportunity will allow businesses to allocate those dollars to value-creating enterprises and parity in effective capital tax rates will allow investment to more efficiently flow to its highest-valued use.

CONCLUSION

The complexity and breadth of the US tax code can make any change seem trivial on its own. Expensing can be one of many necessary tools to move toward a better tax policy. Expensing may have some short-run costs, but these are outweighed by the long-run gains in efficiency, fairness, and economic growth. Effective tax rates influence how businesses allocate their investments, and a flat zero rate on all investment will allow more efficient economic allocation.

Moving away from depreciation toward full expensing will not be an easy sell to stakeholders. Many industries enjoy their favored tax status, while politicians enjoy the ability to hand out favorable depreciation schedules. Expensing should be an easy sell to those who have an eye on future economic growth. Full cost recovery will help move away from distortionary taxes that have biased investors against long-lived investments, such as manufacturing plants and commercial buildings. The lower effective tax rates would be a boon for investment and help stimulate economic growth.[70] These changes might shake up some privileged industries, but almost everyone will be better off with an efficient and equitable tax treatment of capital.

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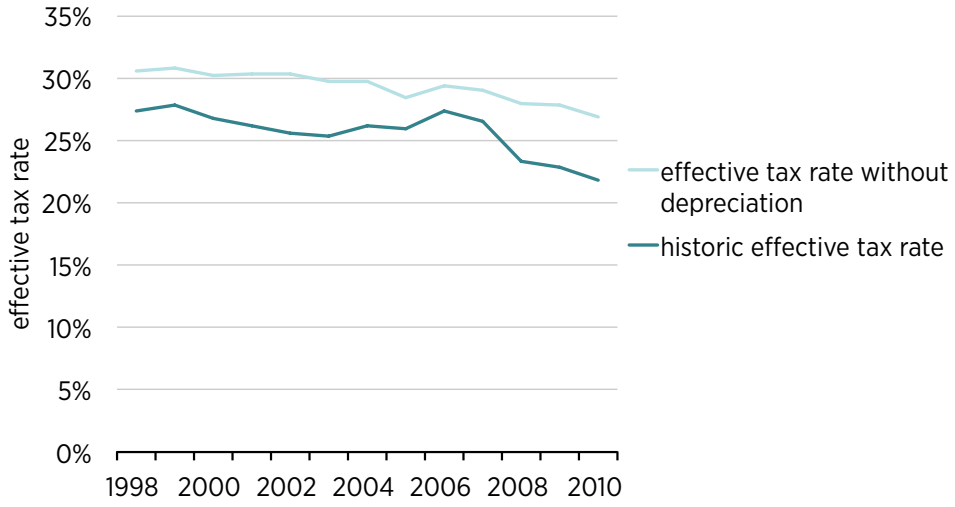
68. Jason J. Fichtner, "Increasing America's Competitiveness by Lowering the Corporate Tax Rate and Simplifying the Tax Code," Testimony before the United States Senate Committee on Finance, January 31, 2012.
69. Auerbach, "Modern Corporate Tax," 12; Schuyler, "Growth and Revenue Effects of Four Proposed Depreciation Systems."
70. Entin, "Tax Treatment of Capital Assets," 19.

Lastly, it is important that we note for the record that any tax on a corporation is a tax on individuals. Many people view the taxing of corporations as if some faceless entity were paying the tax. However, corporations are made up of individual investors and workers attempting to earn money by maximizing profits. Companies are not the only ones affected by corporate tax rates. Individuals are also affected when high tax rates force corporations to charge more for their products and services. The poorly constructed US corporate tax is thus a form of double taxation on productive workers, consumers, and investors. Any tax imposed on corporations results in a reduction in employee wages, an increase in costs passed on to consumers, a reduction in the return to capital received by shareholders, or a combination of all three. While abolishing the corporate tax code may not be politically feasible at this time, adopting expensing over depreciation is a step in the right direction.

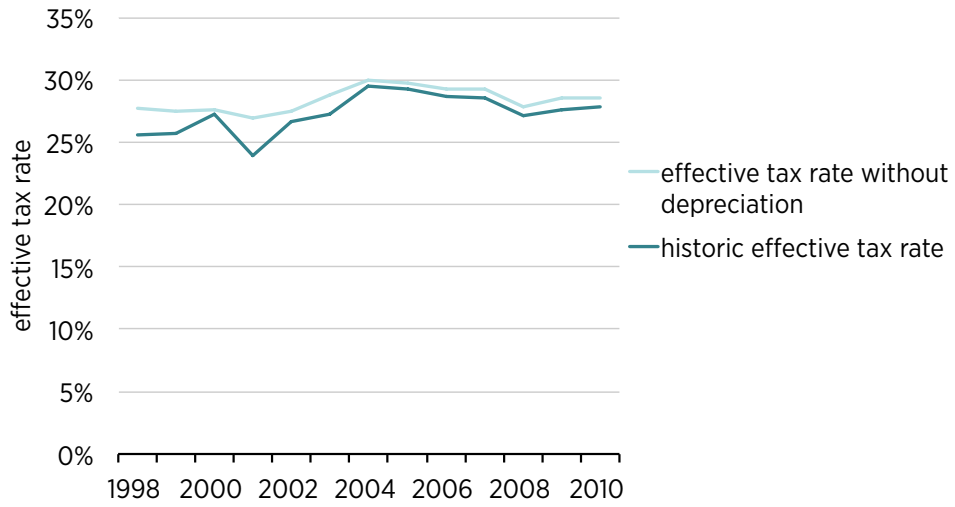
APPENDIX: EFFECTIVE TAX RATES BY INDUSTRY

FIGURE A1. AGGREGATE EFFECTIVE TAX RATES ACROSS ALL INDUSTRIES



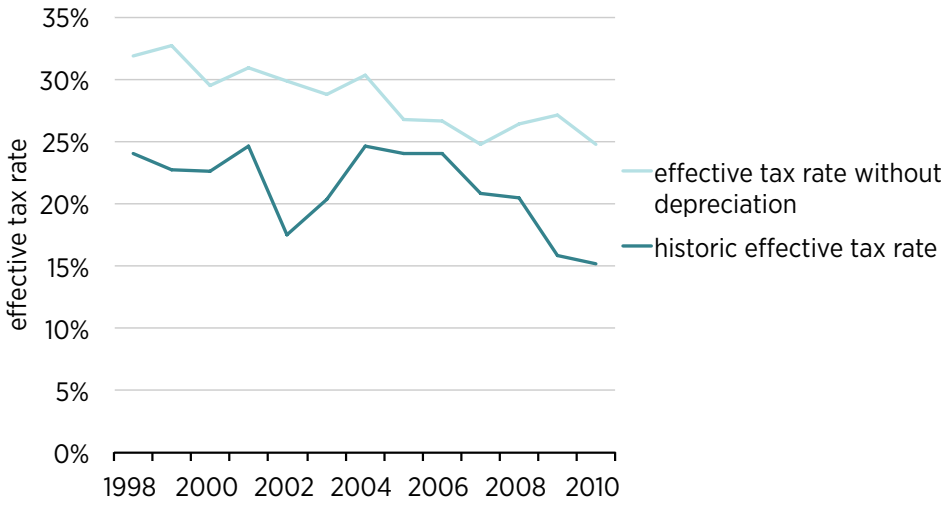
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A2. EFFECTIVE TAX RATES IN THE AGRICULTURE, FORESTRY, FISHING, AND HUNTING INDUSTRY



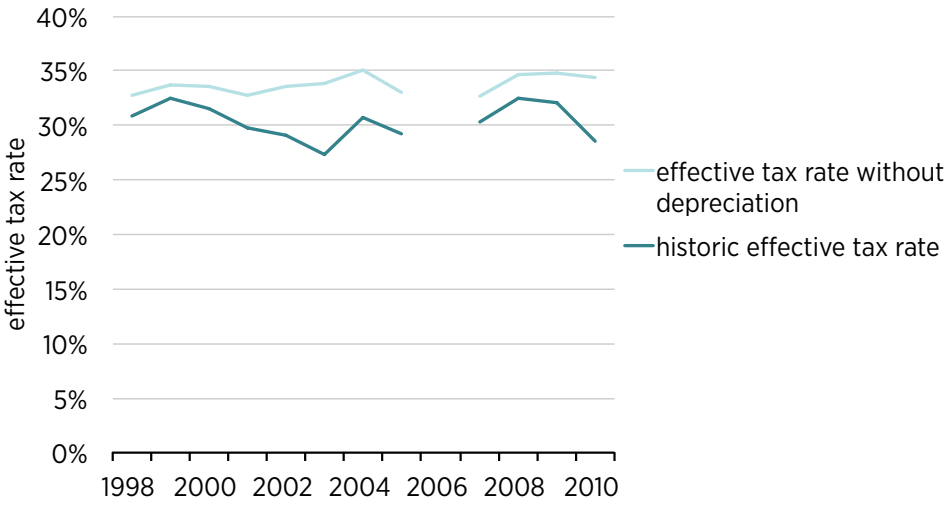
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A3. EFFECTIVE TAX RATES IN THE MINING INDUSTRY



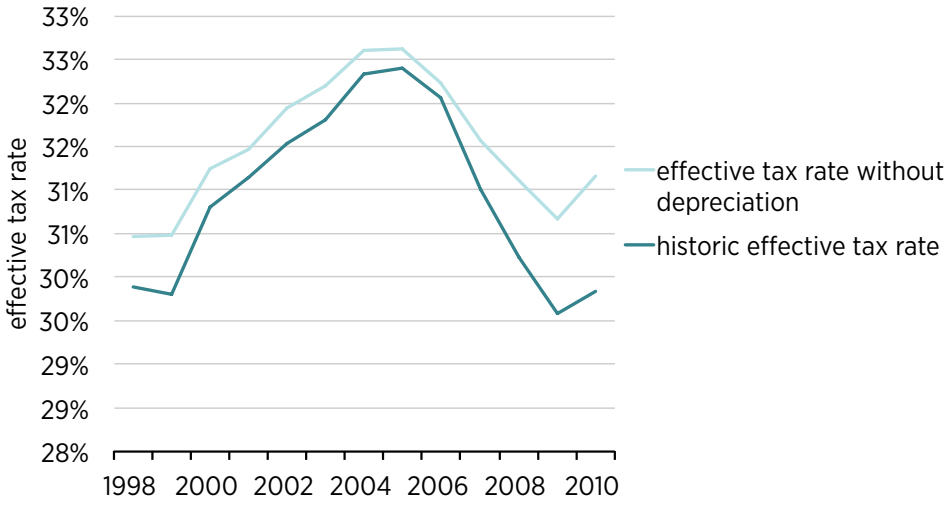
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A4. EFFECTIVE TAX RATES IN THE UTILITIES INDUSTRY



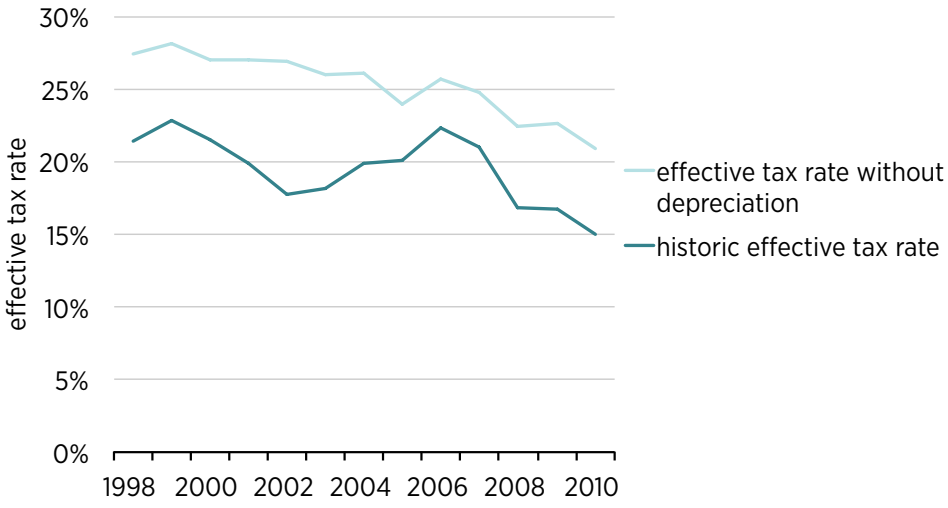
Source: 2006 data for the utilities industry are unavailable. Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A5. EFFECTIVE TAX RATES IN THE CONSTRUCTION INDUSTRY



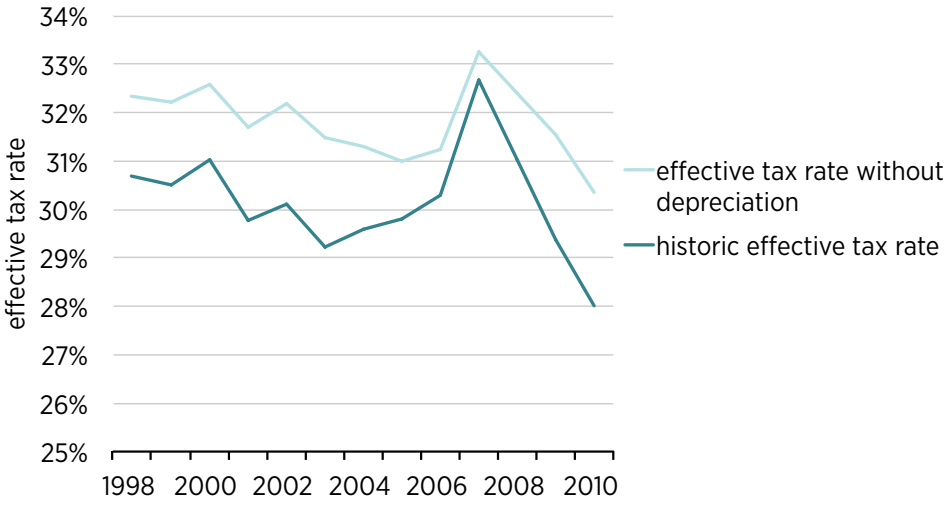
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A6. EFFECTIVE TAX RATES IN THE MANUFACTURING INDUSTRY



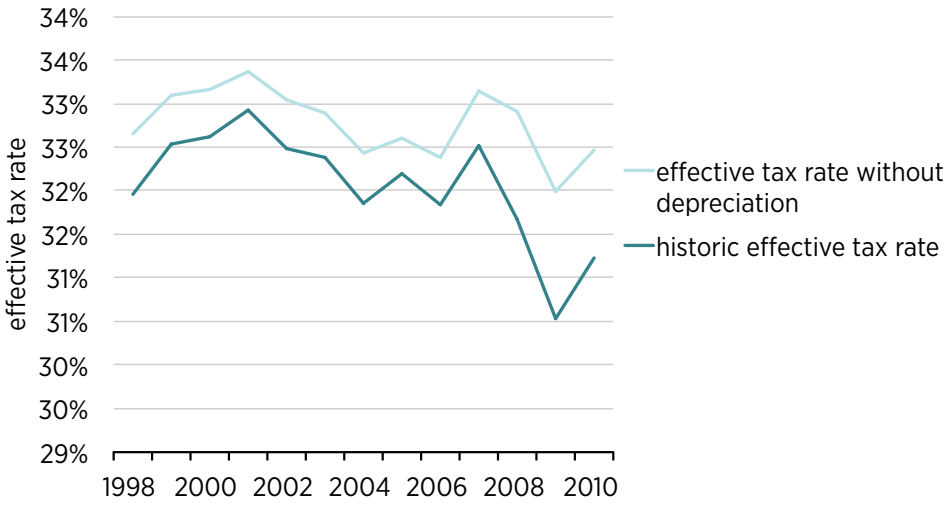
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A7. EFFECTIVE TAX RATES IN THE WHOLESALE TRADE INDUSTRY



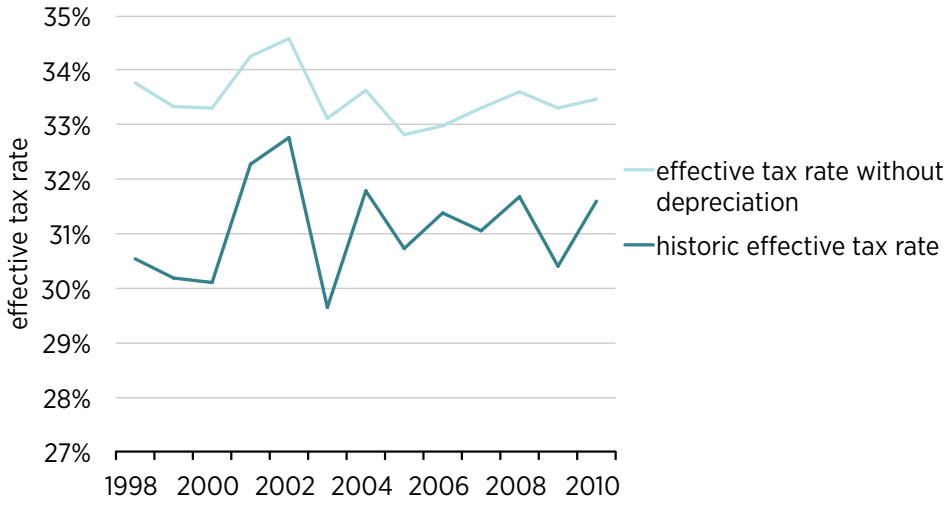
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A8. EFFECTIVE TAX RATES IN THE RETAIL TRADE INDUSTRY



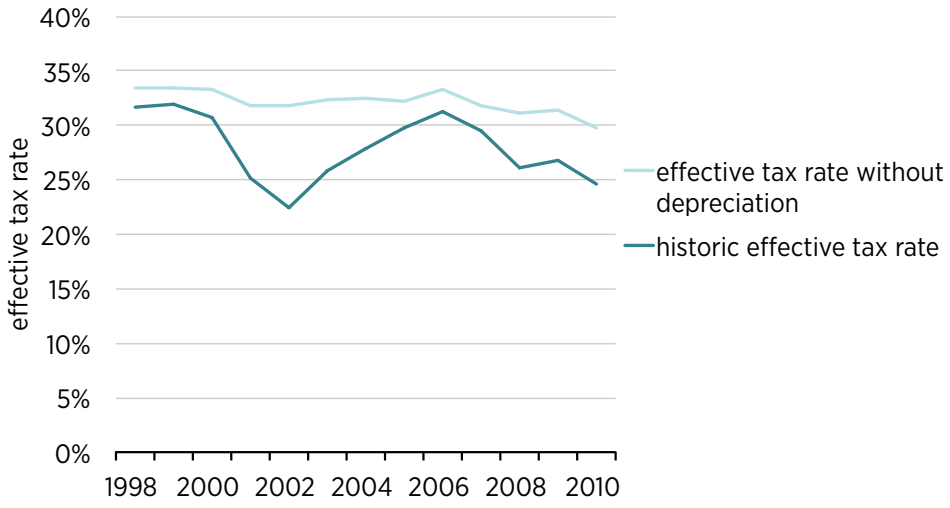
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A9. EFFECTIVE TAX RATES IN THE TRANSPORTATION AND WAREHOUSING INDUSTRY



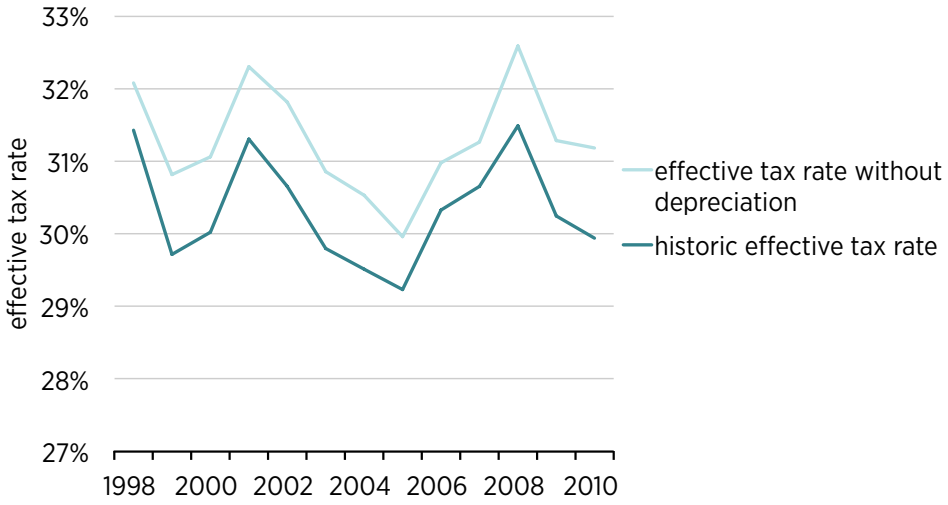
Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A10. EFFECTIVE TAX RATES IN THE INFORMATION INDUSTRY



Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A11. EFFECTIVE TAX RATES IN THE FINANCE AND INSURANCE INDUSTRY



Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

FIGURE A12. EFFECTIVE TAX RATES IN THE HEALTH CARE AND SOCIAL ASSISTANCE INDUSTRY

Source: Authors' calculation. Internal Revenue Service, "Table 12—Returns of Active Corporations, Other Than Forms 1120-REIT, 1120-RIC, and 1120S" (1998–2012), last modified June 27, 2014, http://www.irs.gov/uac/SOI-Tax-Stats-Table-12-Returns-of-Active-Corporations,-Other-Than-Forms-1120-REIT,-1120-RIC,-and-1120S.

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