Congressional Research Service
Informing the legislative debate since 1914

Bonus Depreciation: Economic and Budgetary Issues

Jane G. Gravelle
Senior Specialist in Economic Policy

July 7, 2014

Congressional Research Service
7-5700
www.crs.gov
R43432

CRS REPORT
Prepared for Members and
Committees of Congress

Summary

The Tax Extenders Act of 2013 (S. 1859), which would extend expiring tax provisions for a year, includes bonus depreciation and H.R. 4718 proposes to make bonus depreciation permanent. The temporary provisions enacted in the past for only a year or two and extended multiple times are generally referred to collectively as the "extenders." One reason advanced for these temporary provisions is that time is needed to evaluate them. Most of these provisions, however, have been extended multiple times, and some suggest that these provisions are actually permanent but are extended a year or two at a time because permanent provisions would significantly increase the costs in the budget horizon. Historically, bonus depreciation has not been a traditional "extender."

Bonus depreciation allows half of equipment investment to be deducted immediately rather than depreciated over a period of time. Bonus depreciation was enacted for a specific, short-term purpose: to provide an economic stimulus during the recession. Most stimulus provisions have expired. Bonus depreciation has been in place six years (2008-2013), contrasted with an earlier use of bonus depreciation in place for three years. Is bonus depreciation temporary or permanent? The analysis of bonus depreciation differs for a temporary stimulus provision, compared to a permanent provision that can affect the size and allocation of the capital stock.

A temporary investment subsidy was expected to be more effective than a permanent one for short-term stimulus, encouraging firms to invest while the benefit was in place. Its temporary nature is critical to its effectiveness. Yet, research suggests that bonus depreciation was not very effective, and probably less effective than the tax cuts or spending increases that have now lapsed.

If bonus depreciation is made permanent, it increases accelerated depreciation for equipment, contributing to lower, and in some cases more negative, effective tax rates. In contrast, prominent tax reform proposals would reduce accelerated depreciation. Making bonus depreciation a permanent provision would significantly increase its budgetary cost.

Compared to a statutory corporate tax rate of 35%, bonus depreciation lowers the effective tax rate for equipment from an estimated 26% rate to a 15% rate. Buildings are taxed approximately at the statutory rate. Total tax rates would be slightly higher because of stockholder taxes. Because nominal interest is deducted, however, effective tax rates with debt finance can be negative. For equity assets taxed at an effective rate of 35%, the effective tax rate on debt-financed investment is a negative 5%. The rate on equipment without bonus depreciation is minus 19%; with bonus depreciation it is minus 37%.

If bonus depreciation is permanent, estimates of U.S. effective tax rates reflecting concerns that the U.S. rate is higher than that of other countries overstate the effective U.S. corporate tax rate; U.S. effective tax rates on equipment would be significantly lower than the OECD average.

Moving to permanent bonus depreciation is inconsistent with tax reform proposals made by the Wyden-Coats bill, the Senate Finance Committee Staff discussion draft, and Chairman Camp's proposal. All of these proposals would reduce the current accelerated depreciation for equipment.

The usual extenders cost a fraction of the cost of permanent provisions in a 10-year budget window, but bonus depreciation is a smaller fraction because it is a timing provision. A one-year extension costs $5 billion for FY2014-FY2024, less than 2% of the cost of $263 billion for a permanent provision.

Contents

Tables

Appendixes

Contacts

The Tax Extenders Act of 2013 (S. 1859, introduced by Senate Majority Leader Reid) would extend expiring tax provisions for a year, including another year's extension of bonus depreciation, through 2014. The House has proposed to make selected expiring provisions permanent and H.R. 4718 proposes to make bonus depreciation permanent. The temporary provisions enacted in the past for only a year or two and extended multiple times are generally referred to collectively as the "extenders."[1] One reason advanced for temporary provisions has been that time is needed to evaluate them. Most of these provisions, however, have been extended multiple times (for example, the R&D credit has been extended 15 times since 1981) without such an evaluation, which leads some to suggest that these are provisions that are actually permanent but are extended a year or two at a time because assuming permanence would increase costs in budget projections.[2]

The inclusion of bonus depreciation in the latest extenders bill, which would reflect an extension for a seventh straight year, creates ambiguity about the nature of this provision, which is far from a minor provision. Bonus depreciation is not a traditional "extender." It was enacted for a specific, short-term purpose: to provide an economic stimulus during the recession. Its temporary nature is critical to its effectiveness.

Most of the major provisions of the stimulus bills in 2008 and 2009 (the Economic Stimulus Act of 2008, P.L. 110-185, and the American Recovery and Reinvestment Act, P.L. 111-5) or their replacements have expired. Therefore, a question arises about the nature of bonus depreciation. If it is not included in the extenders package, its status as a temporary provision becomes clear. But if it is included, the action may or may not indicate that the provision has become permanent. However, if it is effectively permanent, there are important implications for the overall treatment of capital income, international comparisons of tax rates, consistency with tax reform proposals, and revenue issues.

This report discusses bonus depreciation as either a temporary stimulus provision or a permanent part of the tax code.

What Is Bonus Depreciation?

Tax depreciation rules determine how quickly the cost of an investment in assets, such as equipment or buildings, can be deducted. Since these assets produce output over a period of years, the cost of acquiring them is also deducted over a period of years so that costs can be matched with receipts to measure profits. To measure profits correctly, the deduction in each period should match the decline in the value of the asset (i.e., the change in price if it were to be sold); this change in value is called economic depreciation.

[1] See CRS Report R43124, *Expired and Expiring Temporary Tax Provisions ("Tax Extenders")*, by Molly F. Sherlock, for further discussion.

[2] This reason is one of several suggested by Rosanne Altshuler, Testimony on Extenders and Tax Reform: Seeking Long-Term Solutions before the Senate Finance Committee, January 31, 2012, http://www.finance.senate.gov/hearings/hearing/?id=b1604e2e-5056-a032-52ff-dd661f9280f6.

Tax Depreciation

Tax law contains rules that prescribe how asset costs are deducted. These rules consist of a life (the number of years over which deductions are taken) and a method. If deductions are taken in equal amounts in each year (for example, if a $1million asset is deducted over 10 years with $100,000 deducted in each year) the method is called straight line. Faster methods are declining balance methods where a rate higher than straight line is applied to the undepreciated balance. In the 10-year example, with double declining balance, twice the rate (2/10, or 20%) would apply the first year for a deduction of $200,000. This 20% rate would apply the next year on the $800,000 not yet depreciated (for $160,000) and so on, with a switch to straight line allowed at any time. At that point, which is optimal after the fifth year, straight line depreciation of the remaining balance over the remaining life (that is, one-fifth of the remaining balance per year) is allowed. Other declining balance rates (such as 150%, where the first year's deduction is 1.5 times straight line) have also been used, now and in the past.

When depreciation rules were set in the Tax Reform Act of 1986 (P.L. 99-514), they allowed for accelerated deductions to offset the lack of indexing for inflation, so that the discounted present value of tax depreciation deductions was roughly equal to the discounted present value of economic depreciation.[3] Since that time, inflation has declined and caused the value of tax depreciation to be more beneficial than economic depreciation. For non-residential buildings, the inflation effect has been offset by an increase in tax lives. For equipment, with costs deducted over relatively short periods of time and under accelerated declining balance methods, tax depreciation is more generous than economic depreciation.

If tax depreciation is equal to economic depreciation in present value, the effective tax rate for the firm (the difference between the before-tax rate of return on the investment and the firm's after-tax return, divided by the before tax return) is equal to the statutory rate for an equity investment. (Rates are higher for equity investment when shareholder taxes are imposed, but may be negative for debt-financed investment.)[4] If depreciation has a greater present value than economic depreciation the effective tax rate falls below the statutory rate for firm-level taxes on equity investment; if all of the cost is immediately deducted the effective tax rate is zero.

Most equipment is depreciated over 5 or 7 years using the double declining balance method. Some longer-lived assets are depreciated over 10, 15, or 20 years, and some shorter-lived property is deducted over 3 years. Property with a life over 10 years is depreciated using the150% declining balance method.[5]

---

[3] Economic depreciation would allow nominal deductions to be larger to account for inflation. Thus if the inflation rate were 2%, in the straight line example over 10 years, the second year's depreciation would be $102,000, because $102,000 is worth $100,000 in year one prices. The third year would be $104,040, which is $100,000 times $(1.02)^2$ and so on. However, tax depreciation is not indexed, so to offset the smaller nominal amount, deductions need to occur earlier. The present discounted value is the sum of each year's deductions, each discounted by the after-tax return. Thus, if the discount rate is 7%, $100,000 a year from now is worth only $93,458 (or $100,000 divided by 1.07). The next year's amount would be divided by $(1.07)^2$, and so on.

[4] If an investment is financed by debt, with economic depreciation and no inflation, the effective tax rate on debt at the firm level is zero, because the return is taxed, but the interest is deducted. The only tax that is imposed is that on the creditor. Tax depreciation that is more valuable than economic depreciation, inflation, or exempt creditors can cause the tax rate on debt to be negative.

[5] According to data in James Mackie III and John Kitchen, "Slowing Depreciation in Tax Reform," *Tax Notes*, April 29, 2013, pp. 511-521, 48% of equipment investment is in the five year class and 26% is in the seven year class. The (continued...)

Depreciation rules also include a half-year convention to deal with the fact that assets are purchased over the course of a year. This rule allows only half of the full year's depreciation to be taken in the first year. Thus, a five-year asset actually generates six years of depreciation deductions.

Buildings are depreciated using the straight line method; commercial and industrial buildings are depreciated over 39 years and residential buildings over 27.5 years.

Bonus Depreciation

Bonus depreciation allows a fraction of the cost to be deducted immediately (referred to as partial expensing). The most recent bonus depreciation rule allowed half of the cost of equipment purchased and placed in service in 2013 to be deducted immediately. Thus, it is similar to accelerated depreciation in that bonus depreciation lowers the tax burden on new investment.

For example, in the previous example of straight line depreciation of a $1 million asset over 10 years, with bonus depreciation, half ($500,000) would be deducted immediately and the remaining $500,000 would be deducted over 10 years with $50,000 deducted per year. Depreciation in the first year would increase from $100,000 to $550,000.

While general bonus depreciation has expired for most property, certain property that has a long pre-production period and transportation property is still eligible for bonus depreciation through 2014.

Section 179 Expensing

Bonus depreciation is often discussed along with another provision that allows more generous depreciation than the normal rules, a provision allowing the expensing of a limited dollar amount of investment. An increase in these dollar limits has recently been extended in tandem with bonus depreciation. This expensing provision has, however, a limited scope compared to bonus depreciation and is not analyzed in this report.[6]

(...continued)

remaining classes of 3, 10, 15 and 20 account for 6%, 4%, 11% and 6% of investment, respectively. Deductions for equipment accounted for 54% of investment and buildings for 44%. Residential buildings were 46% of buildings and commercial and industrial buildings were 54%.

[6] This expensing provision has been in the tax code in some form since 1958, and has been justified as a simplification measure for small business. It, too, is included in the extenders legislation, but the increase represents two components: increases during the Bush Administration that expired as was the case of a number of provisions, and a set of increases beginning in 2008 associated with stimulus. Based on revenue estimates for the American Taxpayer Relief Act (Joint Committee on Taxation, JCX-1-13, January 21, 2013) when Section 179 was extended for two years and bonus depreciation for one, the cost of extended Section 179 is about 12% of the cost of bonus depreciation. Other estimates suggest a larger share. See the section on revenue in this report. For further discussion of both provisions see CRS Report RL31852, *Section 179 and Bonus Depreciation Expensing Allowances: Current Law, Legislative Proposals in the 113th Congress, and Economic Effects*, by Gary Guenther.

Historical Development

Bonus depreciation was first enacted in the Job Creation and Worker Assistance Act of 2002 (P.L. 107-147) at a 30% rate, for three years, with the purpose of stimulating investment during an economic slowdown. Concerns about the economy had come in the aftermath of the 2001 terrorist attacks. Although the bonus depreciation rate was increased by the Jobs and Growth Tax Relief Reconciliation Act of 2003 (P.L. 108-27) to 50% in the following year and extended for a year, it expired at the end of 2005.

With the financial distress and recession that began in 2007, the Economic Stimulus Act of 2008 (P.L. 110-185) was enacted to stimulate the economy, including a single year of bonus depreciation at 50%. Bonus depreciation was not the centerpiece of the stimulus; the major tax cut, much larger than bonus depreciation, was an individual tax rebate.

As the recession continued, a much larger stimulus measure was adopted in 2009 (the American Recovery and Reinvestment Act, P.L. 111-5). It extended bonus depreciation for an additional year, through 2009. Bonus depreciation was only a minor part of a larger package that included a two-year individual tax credit aimed at low-income individuals (the Making Work Pay Credit) and spending increases that were much larger than the tax reductions.

Bonus depreciation has continued to be extended. It expired in 2010 but was extended retroactively through 2010 by the Small Business Jobs Act of 2010 (P.L. 111-240), enacted at the end of September 2010. This bill was not a stimulus bill, but one associated with small business. There are a couple of points to note regarding the inclusion of bonus depreciation in the 2010 Small Business Jobs Act. First, bonus depreciation is more valuable to large firms, especially when small businesses are given higher allowances. Second, most of the extension of bonus depreciation was retroactive (three quarters of the year had passed when the bill was adopted). Thus, the extension provided a windfall to firms for that period, rather than a stimulus.

At the end of 2010, several tax provisions were to expire. As expected for a number of years, the tax cuts enacted in 2001 and 2003 (and popularly known as the Bush tax cuts) were to expire. The regular "extenders" had already expired at the end of 2009. Finally, many of the stimulus provisions enacted in 2009, including the Making Work Pay credit along with provisions relating to education, the child credit, and the earned income credit (along with some spending provisions) were expiring. Bonus depreciation and increased Section 179 expensing were also expiring. The Tax Relief, Unemployment Compensation Reauthorization, and Job Creation Act of 2010 (P.L. 111-312) extended the Bush tax cuts and the 2009 provisions relating to education, the child credit, and the earned income credit for two years and retroactively extended the "extenders" for two years (through 2011). It increased bonus depreciation to 100% for the period from September 8, 2010, through 2011, and then allowed it at 50% through 2012, while also extending increased Section 179 expensing. The legislation did not extend the Making Work Pay credit, but it instead reduced the employee's share of the payroll tax by two percentage points. This legislation, enacted when the economy still appeared to be in recession or at least slow recovery, was still pursuing fiscal stimulus objectives, in part. Although the expiration of the Bush tax cuts had been expected for a number of years, their expiration came at a time when large tax increases could damage an economic recovery, so those extensions, at least in part, were also associated with short-term stimulus.

As the slow recovery of the economy continued, issues were raised about a "fiscal cliff" at the end of 2012, when the Bush tax cuts along with the payroll tax relief and some spending measures were due to expire. In addition, previously planned cuts to discretionary spending were scheduled. There was a concern expressed by many economists that this combination of increased taxes and reduced spending would stall the recovery or even lead to a recession. The American Taxpayer Relief Act of 2012 (P.L. 112-240),which was adopted in early January 2013, made most of the Bush tax cuts permanent and extended bonus depreciation for another year, among other things. [7]

With the possible exception of the Small Business Jobs Act of 2010, the legislation that introduced bonus depreciation and extended it through six years was largely associated with fiscal stimulus bills (or bills that contained other fiscal stimulus proposals). Moreover, even the Small Business Jobs Act of 2010 was intended to stimulate investment and addressed provisions which had, unlike other tax cuts in the 2009 stimulus, expired. The proposal to include bonus depreciation in a standard "extenders" bill separates the provision from a fiscal stimulus objective. This inclusion creates uncertainty about the expected future of bonus depreciation and suggests an analysis of it either as a temporary stimulus or a permanent provision.

Effectiveness as a Temporary Fiscal Stimulus

Investment incentives may be relatively ineffective during a recession that reflects inadequate demand, when firms have idle capital.[8] The temporary nature of bonus depreciation makes it, in theory, a more effective fiscal stimulus than other investment incentives because it is in the nature of a fire sale. The bonus depreciation enacted in late 2002 and lasting through 2005 set the stage for the potential effectiveness of the provision in the 2007-2009 recession by signaling that it was temporary. The continual extension of the current provision, that thus far has lasted six years, may undermine the use of the provision in the future if firms expect the provision to last a long time.

Some evidence suggests that the temporary bonus depreciation enacted in 2002 had little or no effect on business investment. A study of the effect of temporary expensing by Cohen and Cummins at the Federal Reserve Board found little support for a significant effect.[9] They suggested several potential reasons for a small effect. One possibility was that firms without taxable income could not benefit from the timing advantage. In a Treasury study, Knittel confirmed that firms did not elect bonus depreciation for about 40% of eligible investment, and speculated that the existence of losses and loss carry-overs may have made the investment subsidy ineffective for many firms, although there were clearly some firms that were profitable that did not use the provision.[10] Cohen and Cummins also suggested that the incentive effect was quite small (largely because depreciation already occurs relatively quickly for most equipment),

[7] See CRS Report R42700, *The "Fiscal Cliff": Macroeconomic Consequences of Tax Increases and Spending Cuts*, by Jane G. Gravelle, for a discussion of the macroeconomic issues and a summary of the provisions of P.L. 112-240.

[8] For a general review of the effects of business incentives see CRS Report RL31134, *Using Business Tax Cuts to Stimulate the Economy*, by Jane G. Gravelle.

[9] Darryl Cohen and Jason Cummins, *A Retrospective Evaluation of the Effects of Temporary Partial Expensing*, Finance and Economics Discussion Series 2006-19, Federal Reserve Board, Washington, DC. April 2006. They compared investment increases for shorter lived and longer lived assets (longer lived assets received a larger incentive) and investment closer to expiration to test the effects.

[10] Matthew Knittel, *Corporate Response to Bonus Depreciation: Bonus Depreciation for Tax Years 2002-2004*, U.S. Department of Treasury, Office of Tax Analysis Working Paper 98, May 2007.

reducing the user cost of capital by only about 3%,[11] and that planning periods may have been too long to adjust investment across time. Knittel also suggests that firms may have found the provision costly to comply with, particularly because most states did not allow bonus depreciation.

A study by House and Shapiro found a more pronounced response to bonus depreciation, given the magnitude of the incentive, but they also found that the overall effect on the economy was small. In their view, this effect was due in part to the limited category of investment affected and the small size of the incentive.[12] Their differences with the Cohen and Cummins study reflected, in part, uncertainties about when expectations were formed and when the incentive effects occurred.

Cohen and Cummins also reported the results of several surveys of firms, which showed that between two-thirds and more than 90% of respondents indicated bonus depreciation had no effect on the timing of investment spending.

A study by Hulse and Livingstone found mixed results on the effectiveness of bonus depreciation, which they interpret as weakly supportive of an effect.[13]

Forecasters vary in the multipliers they assign different tax and spending provisions.[14] (A multiplier estimates the amount of economic output resulting from a certain amount of stimulus.) For example, CBO, during discussion of the fiscal cliff, indicated a multiplier of 0.15 for business tax cuts in general, and a multiplier of 0.6 for expensing. The latter suggests a dollar of budgetary cost spending induces a 60-cents increase in output. The dollar of cost was measured as the present value of bonus depreciation. This multiplier was among the smaller ones with payroll taxes having a multiplier of 0.9 and unemployment insurance a multiplier of 1.1. Zandi had similar multipliers for these latter provisions but assigned a multiplier of 0.2 for bonus depreciation, measuring the provision as the first year tax saving (a larger number than present value).

Overall, bonus depreciation did not appear to be very effective in providing short-term economic stimulus compared to alternatives.

There are also concerns about the effectiveness of bonus depreciation when the extension is retroactive. When bonus depreciation is extended retroactively, the benefit is a windfall which cannot affect investment. Although S. 1859 was introduced in 2013 and would not have had a

[11] The user cost of capital is the "price" of using capital, just as the wage is the price of labor. The user cost is the sum of the pre-tax return and the economic depreciation rate. Bonus depreciation increases the present value of tax depreciation and affects the use cost via a change in the required pre-tax rate of return, needed for an investment to yield a required after-tax return.

[12] Christopher House and Matthew Shapiro, *Temporary Investment Tax Incentives: Theory With Evidence from Bonus Depreciation*, National Bureau of Economic Research Working Paper 12514, Cambridge, Mass., September 2006. Subsequently published as Christopher House and Matthew Shapiro, "Temporary Investment Tax Incentives: Theory With Evidence from Bonus Depreciation," *American Economic Review*, Vo. 98, June 2008, pp. 737-768.

[13] Davis S. Hulse and Jane R. Livingstone, Incentive Effects of Bonus Depreciation, January 2010, http://www.ifigr.org/workshop/spring10/Hulse.pdf.

[14] These multipliers are presented in more detail in CRS Report R42700, *The "Fiscal Cliff": Macroeconomic Consequences of Tax Increases and Spending Cuts*, by Jane G. Gravelle.

windfall if enacted when introduced, enacting a retroactive extension for 2014 currently would have windfall elements.

Bonus Depreciation as a Permanent Provision

If bonus depreciation is permanent, it affects the size and allocation of the capital stock. In particular, it lowers the tax rate on equipment relative to other depreciable assets.

Effective Tax Rates

The standard way to measure the effect of depreciation rules on tax burdens is to consider the influence of the provision on the required return to a new investment. This approach requires an estimate of the required internal pre-tax rate of return for an investment to break even (i.e., the pre-tax rate of return needed to earn a required after-tax return).[15] The effective tax rate is measured as the pre-tax return minus the after-tax return, divided by the pre-tax return. In other words it measures the share of the investment's earnings that is paid in tax. The formula for this calculation is presented in the **Appendix**.

Table 1 provides estimated effective tax rates for nonresidential equipment and structures with and without bonus depreciation. The first 22 rows are equipment as classified in the National Income and Product Accounts (NIPA), and the last six rows are structures. As indicated in the table, equipment assets generally have favorable tax depreciation rules, even without bonus depreciation, with effective tax rates falling as low as 17% but generally around the mid-twenties, well below the 35% statutory rate. Public utility structures and farm structures are treated as equipment in the tax code and also have lower tax rates. Non-residential buildings (commercial, industrial and other) tend to be taxed at or above the statutory rate.[16] Residential buildings, not shown, are taxed at around 32%. Bonus depreciation benefits equipment, already favored by the tax code, producing effective tax rates that range from 9% to 21%, with most around the mid-teens.

Assets in **Table 1** are listed from least durable to most durable. In general tax rates within the equipment category tend to be higher for less durable assets because inflation increases the tax burden of shorter lived assets more than longer lived ones. Bonus depreciation tends to have a proportional reduction and brings tax rates closer together because it reduces effective rates more for assets with higher effective rates to begin with (see **Appendix** for formulas).[17] For example, the tax rate for autos, initially at 34% rate, falls by 13 percentage points, while the tax rate for ships and boats, initially at 17%, falls by 8 percentage points. That makes bonus depreciation a more attractive option for permanent tax subsidies than the investment credit, which substantially favors short lived assets. Because expensing applies only to equipment, it increases the distortion between tax burdens on equipment and structures.

[15] This approach uses discounted cash flows. Given an after-tax required return and tax rules, estimates of the level of the required level of output for an investment are made for the after-tax flows discounted at the after-tax return to have a present value equal to the cost of the investment. Then the internal rate of return without taxes is determined.

[16] Mining structures are favorably treated for reasons outside of depreciation such as rapid recovery of drilling costs.

[17] Proportional reductions are larger for lower tax rates, but absolute reductions are smaller.

Table 1. Effective Tax Rates by Asset Type, Non-Residential Fixed Investment With and Without Bonus Depreciation

Asset Type	Without Bonus Depreciation (%)	50% Bonus Depreciation (%)
Autos	34	21
Office/Computing Equipment	31	18
Trucks/Buses/Trailers	29	17
Aircraft	29	17
Construction Machinery	23	13
Mining/Oilfield Equipment	28	16
Service Industry Equipment	28	16
Tractors	27	15
Instruments	28	16
Other Equipment	27	15
General Industrial Equipment	25	15
Metalworking Machinery	23	13
Electric Transmission Equipment	33	20
Communications Equipment	19	10
Other Electrical Equipment	24	13
Furniture and Fixtures	23	13
Special Industrial Equipment	21	12
Agricultural Equipment	21	12
Fabricated Metal	29	17
Engines and Turbines	36	22
Ships and Boats	17	9
Railroad Equipment	18	10
Mining Structures	7	7
Other Structures	40	40
Industrial Structures	37	37
Public Utility Structures	27	16
Commercial Structures	36	36
Farm Structures	26	15

Source: Congressional Research Service. See **Appendix** for method of computation and assumptions.

Table 2 provides a weighted average (with the pre-tax returns weighted by asset share)[18] for equipment, structures and the total. This table indicates that, with bonus depreciation as a permanent part of the tax cost, the effective tax rate on equipment falls from 26% to 15%.

Table 2. Weighted Average Effective Firm Level Tax Rates (Assuming No Debt)

Asset Type	Permanent Law (%)	50% Bonus (%)
Equipment	26	15
Structures	32	29
Total	30	24

Source: Congressional Research Service. See **Appendix** for method of computation and assumptions.

Note: Structures reflect a weighted average of the last six rows of **Table 1**. The remaining assets are equipment.

Note that these calculations do not account for the Section 199 domestic production activity deduction, which allows a 9% reduction in taxable income (a 3.15 percentage point reduction in the statutory tax rate) for domestic production in certain industries.[19] Where applicable, it reduces the effective tax rate for equipment by about 2.5 percentage points, or to around 23%, and the effective tax rate with bonus depreciation by 1.6 percentage points, or to around 13%.

These tax rates capture firm level taxes on investments in equipment and structures. Considering all taxes, the tax rate would be slightly higher, about 5 percentage points for building and 4.6 to 7.3 percentage points for equipment under current law, and 5.3 to 8.4 percentage points for equipment with bonus depreciation.[20] Effective tax rates with debt-financed investment are discussed in the next section.

Debt-Financed Investment

Some might approve of partial expensing as a step toward full expensing of all assets because they prefer a consumption tax, and full expensing of investments is a feature of a consumption tax. Such a tax was proposed as a possible alternative to an income tax in President Bush's Advisory Panel's proposals.[21]

[18] For considering the marginal investment in the economy asset weights that more closely match shares of net investment are used. Gross investment includes both replacement investment and net investment. Using asset weights increases the importance of longer lived assets, compared to using gross investment weights.

[19] See CRS Report R41988, *The Section 199 Production Activities Deduction: Background and Analysis*, by Molly F. Sherlock.

[20] These rates are based on assumptions outlined in the **Appendix**. The lower rates assume the statutory tax rate on dividends and capital gains is 15%. The effective rate on capital gains accounting for deferral and inflation is 17.7%. This rate is reduced by half for capital gains held until death. Both rates are then reduced by half for tax exempt holders. With dividends weighted at 4/7 and capital gains at 3/7, the effective tax rate is estimated at 6.18%. The individual rates apply to earnings net of the corporate rate and must be multiplied by 1 minus the firm-level tax rate. Thus, for buildings taxed at the statutory rate, the additional tax is 6.18% times (1-0.35), or 4%. Some high income taxpayers may have a 3.8% additional tax and some of these taxpayers may be subject to a 20% tax rate. Lower and some middle income taxpayers have a zero tax rate, although these taxpayers hold few assets. The higher rates are based on a 23.8% statutory tax rate on capital gains and dividends.

[21] The President's Advisory Panel on Tax Reform: *Final Report*, November 1, 2005, http://govinfo.library.unt.edu/taxreformpanel/final-report/index.html.

A piecemeal approach to a consumption tax can create negative tax rates on debt financed investment. Under a consumption tax such as that outlined by the Advisory Panel, interest payments would no longer be deductible to firms (or taxed to individuals). If the tax system allows economic depreciation and there is no inflation, no taxes are collected at the firm level because the profit is offset by the interest deduction. The creditor will pay tax and the tax burden on the interest and the tax burden on the investment return is that supplier's tax rate. Allowing accelerated depreciation whether by expensing or other methods causes a negative tax rate at the firm level, because the profit is taxed at the lower effective tax rate and the interest is deducted at the statutory rate. A differential in the tax rate of the firm and the creditor can also contribute to potentially negative tax rates with inflation, because the inflation portion of interest is deducted at the firm's rate and taxed at the individual's rate.

To indicate these effects, with the assumptions in the **Appendix**, the interest rate is 7.5% and the inflation rate is 2%. The marginal individual (creditor) tax rate on interest is 23% and half of it is held in exempt form, for a weighted tax rate of 11.5%. For the creditor, after paying an 11.5% tax, the after-tax nominal interest is 6.64%. The real return after subtracting inflation is 4.64%.

At the firm level, the after-tax real cost of debt is the interest rate minus the 35% tax which is 4.875%. Subtracting the 2% inflation results in an after-tax real cost of 2.875%. To calculate an effective tax rate (which is the pre-tax return minus the after-tax return divided by the pre-tax return) this after-tax return must be divided by one minus the effective tax rate to measure the pre-tax return.

If there is economic depreciation and the effective tax rate is 0.35, then the after-tax rate of return is 2.875%/(1-.35) or 4.42%. This pre-tax return is below the after-tax return, and the total tax rate is a negative 4.8%. This effect is solely due to deducting the inflation portion of the interest rate at a high rate and taxing it at a low one. Accelerated depreciation exacerbates this negative effect. Under the average 26% effective tax rate for equipment under current law without bonus depreciation, the effective tax rate on debt financed investment is -19%. With bonus depreciation, it is -37%.

As these calculations indicate, bonus depreciation is estimated to increase the absolute value of the negative tax rate on debt-financed equipment investment from 19% to 37%.

International Tax Rate Comparisons

One criticism frequently made of the U.S. corporate tax is that its rate is the highest in the world, thus discouraging investment in the United States relative to other countries. Currently the combined federal and state statutory tax rate for the United States is 39.2%, and the rate for the remaining countries in the Organisation for Economic Development and Cooperation (OECD), with countries weighted by size of output, is 28.4%.[22] The statutory rate in the United States would be 36.3% if the domestic production activities deduction were available, which would apply to manufacturing and some other activities.

Average effective tax rates and marginal effective tax rates are estimated to be closer together. **Table 3** presents estimates of the marginal effective tax rates for four basic categories of assets

[22] See CRS Report R41743, *International Corporate Tax Rate Comparisons and Policy Implications*, by Jane G. Gravelle, for tax rates.

(equipment, structures, inventories, and intangibles) and the overall weighted average. These rates are the ones that should affect international investment.

Table 3. Marginal Effective Tax Rates, United States and Weighted OECD

	U.S. Without Production Activities Deduction	U.S. With Production Activities Deduction	U.S. Without Production Activities Deduction and With Bonus Deprecation	U.S. With Production Activities Deduction and With Bonus Depreciation	OECD Excluding United States, GDP Weighted
Equipment	23.0	21.2	13.0	11.9	18.9
Structures	29.0	26.7	26.0	23.7	23.6
Inventories	39.2	36.2	39.2	36.2	28.6
Intangibles	-4.7	-4.7	-4.7	-4.7	-9.7
Total	**22.2**	**20.2**	**18.4**	**16.6**	**16.3**

Source: Tax rates without bonus depreciation from CRS Report R41743, *International Corporate Tax Rate Comparisons and Policy Implications*, by Jane G. Gravelle, OECD rates are those after adjustments for recent tax cuts. Tax rates with bonus depreciation are adjusted for equipment using the formula in the **Appendix**. Structures tax rates are reduced by three percentage points based on estimates on **Table 2**.

The rates for the United States differ somewhat from the estimates in **Table 2** because they are from an international study that uses representative assets, but comparable ones. This table indicates that the U.S. effective marginal tax rate is 22.2% compared to 16.4% in the OECD weighted by size of output. If the Section 199 production activities deduction is available, the U.S. effective rate is 20.2%. The domestic production activities deduction applies to manufacturing, construction and extraction and thus would apply to most multinationals' physical investment. Thus the difference between these effective tax rates is 4 to 6 percentage points as compared to an 8- to 11- percentage point difference in statutory rates. The differences are largest for inventories.

If bonus depreciation is a permanent feature of the tax code, these estimates should be adjusted. Incorporating bonus depreciation reduces overall tax rates by two percentage points, leaving the effective marginal rates very close together and virtually the same when both bonus depreciation and the Section 199 deduction is included. For equipment, the tax rates are two to four percentage points larger; bonus depreciation lowers the U.S. rate to six to seven percentage points below the OECD average.

Comparison to Tax Reform Proposals

There has been a drive for a number of years for an income tax reform that would broaden the base and lower the rate. Several recent proposal are currently of interest and relevant to bonus depreciation: the Wyden-Coats bill (S. 727) in the 112th Congress, the Senate Finance Committee discussion draft released in November 2013 as a preliminary to tax reform,[23] and the draft

[23] See documents on "Cost Recovery and Accounting" at http://www.finance.senate.gov/newsroom/chairman/release/?id=536eefeb-2ae2-453f-af9b-946c305d5c93.

proposal by Dave Camp, Chairman of the Ways and Means Committee, released in February 2014.[24]

These tax reform proposals involve broadening the base to permit lower rates and all have a reform of depreciation that affects effective tax rates on equipment investment. To indicate the nature of the depreciation plan in these proposals, their effective tax rates are discussed with reference to a 35% tax rate, although Wyden-Coats proposes a 24% tax rate, the Senate draft proposes lower rates but does not provide a specific number, and the Camp proposal would lower the rate to 25%.

The Wyden-Coats bill proposes to return depreciation to the alternative depreciation system (now available as an option), with longer lives and straight line depreciation. This system would closely approximate economic depreciation with an estimated effective tax rate (given a 35% statutory rate) of 36% for equipment, 34% for structures and an overall rate of 35%.[25]

The Senate Finance Committee discussion draft would adopt a system similar to that proposed by the Treasury Department during the debate over tax reform in 1986. At the heart of the system would be open-ended pools of aggregated assets, where a depreciation rate would apply to each pool (and investment would be added each year). The objective of this proposal is to achieve economic depreciation in the aggregate.

Ways and Means Chairman Camp has released a tax reform draft proposal that, like the Wyden-Coats proposal, would move to the alternative depreciation system. This proposal would also index depreciation for inflation. At the same time, it would limit the deduction to recovery of the original basis. Overall, this treatment amounts to accelerated depreciation that depends on the inflation rate. Since current inflation is relatively low, a slight degree of acceleration would occur. The estimated tax rate for equipment, structures and overall if the statutory rate were 35% would be 35%, 33%, and 34% respectively. Thus tax rates would be lower by about one percentage point compared to a move to the alternative depreciation system.[26]

The Wyden-Coats bill would reduce the statutory tax rate to 24% and the Camp proposal would reduce it to 25%. Thus both proposals would impose a 24% effective rate on equipment and structures overall.

Bonus Depreciation and Revenues

Some have suggested that the traditional extenders have been repeatedly enacted on a temporary basis because the revenue cost is much smaller for a single year's extension compared to a permanent extension with the 10-year budget horizon.[27] Without growth, one would expect a

[24] See Joint Committee on Taxation, Technical Explanation of the Tax Reform Act of 2014, Business Tax Reform, JCX-14-14, February 26, 2014, at https://www.jct.gov/publications.html?func=startdown&id=4556.

[25] See Jane G. Gravelle, "Reducing Depreciation Allowances to Finance a Lower Corporate Tax Rate," *National Tax Journal*, December 2011, vol. 64, no. 4, pp. 1039-1053.

[26] The method of calculating the truncated life is shown in the **Appendix**.

[27] See, for example, Rosanne Altshuler, Testimony on Extenders and Tax Reform: Seeking Long-Term Solutions before the Senate Finance Committee, January 31, 2012, http://www.finance.senate.gov/hearings/hearing/?id=b1604e2e-5056-a032-52ff-dd661f9280f6, and Donald Marron, Testimony on the "Tax Expirers" before the Subcommittee on Select Revenue Measures, House Ways and Means Committee, June 89, 2012, (continued...)

standard provision to cost only 10% of the permanent 10-year cost; with growth it would be somewhat less because each year's cost would be slightly larger than the year before.

Bonus depreciation and Section 179 expensing cost even less compared to their cost in the 10-year budget horizon because most of the initial revenue loss is recovered during the budget horizon. Contrast the patterns in **Table 4**, which shows the last revenue estimate for a one-year extension, and **Table 5**, which shows the revenue loss if both provisions are made permanent. In **Table 4**, there is an initial loss from bonus depreciation, (generally spread over the first two fiscal years), but revenue is gained in the following years as firms no longer take deductions that would have been taken under normal depreciation. In **Table 5**, there is a new round of investment in each year, always with a revenue loss, but one that declines as each year there are more gains from not taking depreciation on earlier vintages of investment to offset the current year's loss.

Although the estimates in the two tables are separated by a year, they provide some idea of the magnitude of the difference. The combination of bonus depreciation and half of Section 179 expensing in **Table 4** is only 1.7% of the total of these provisions in **Table 5**. Half of the traditional extenders estimate in **Table 4** is 7.7% of the total estimate for other expiring provisions in **Table 1**. (These ratios would be slightly larger if both tables covered the same time periods.)

Table 4. Revenue Loss from Extending Expiring Provisions in the American Taxpayer Relief Act of 2012

(billions of dollars)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2013 - 2022
Bonus Depreciation for One Year	-34.4	-15.8	15.0	10.1	7.5	5.7	3.4	2.0	1.1	0.7	-4.7
Section 179 for Two Years	-8.1	-4.0	3.1	2.0	1.5	1.2	0.7	0.5	0.4	0.3	-2.3
Traditional Extenders for Two Years	-31.3	-13.8	-3.2	-2.8	-2.8	-3.0	-3.4	-2.1	-0.1	-0.9	-69.2

Source: Joint Committee on Taxation, JCX 1-1-13, January 1, 2013, at https://www.jct.gov/publications.html?func=startdown&id=4497.

(...continued)

http://waysandmeans.house.gov/uploadedfiles/marron.pdf.

Table 5. The Cost of Permanently Extending Expiring Provisions

(billions of dollars)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2014 - 2023
Bonus Depreciation and Section 179 Expensing	40.7	64.9	53.8	46.5	37.3	27.3	21.1	18.5	17.7	18.2	346.1
Temporary ARRA Provisions	0.0	0.0	0.0	0.0	2.4	27.8	27.7	27.6	27.6	27.3	140.4
Extend Other Expiring Tax Provisions	13.5	29.0	33.1	36.6	41.9	47.1	53.7	59.6	65.4	71.9	451.8

Source: CRS Report R43124, *Expired and Expiring Temporary Tax Provisions ("Tax Extenders")*, by Molly F. Sherlock, which was in turn based on additional data provided in conjunction with Congressional Budget Office, *Updated Budget Projections: Fiscal Years 2013 to 2023*, Washington, DC, May 14, 2013, http://www.cbo.gov/publication/44172.

Notes: ARRA provisions are currently scheduled to expire on December 31, 2017. Includes a lower earned income threshold for the refundable portion of the child tax credit, expansions to the earned income tax credit (EITC), and the American Opportunity Tax Credit (AOTC).

Table 5 does not separate the cost of bonus depreciation and Section 179 expensing. Based on revenue estimates in **Table 4**, bonus depreciation is about 90% of the total (4.7/(4.7+.5*2.3)). However, the latest CBO estimate for the federal budget in coming years indicates a revenue cost of $263 billion for a permanent extension of bonus depreciation for the period FY2014-FY2024, which indicates bonus depreciation is about 76% of the total cost for a permanent extension.[28] Thus, these estimates indicate that a one year extension costs $5 billion for FY2014-FY2024, less than 2% of the cost of $263 billion for a permanent provision.

Note also that the cost of a permanent extension of bonus depreciation is larger than the steady state cost if the system had been in place for a long time. The cost declines in **Table 5** for bonus depreciation and Section 179 expensing, because as each year passes more revenue gain occurs for more previous investments. If the tenth year is an approximate steady state, as appears to be the case, the permanent cost would be around 40% of the totals in **Table 5**, or $140 billion, and bonus depreciation (at 76% of the cost) would be $105 billion.[29] That would make a one-year extension about 5% of the steady state.

By contrast, for most of the expiring provisions revenue costs rise over time under a permanent extension, which reflects growth and, to a limited extent, some part of each year's cost that falls in future years for some provisions.

[28] Congressional Budget Office, The Budget and Economic Outlook: 2014 to 2024, February 2014, http://www.cbo.gov/publication/45010.

[29] This steady state is calculated by summing the 10^{th} year along with the previous year, the 10^{th} year divided by (1+g) where g is the growth rate, the 10^{th} year divided by $(1+g)^2$, and so forth.

Appendix. Methodology for Effective Tax Rates

This appendix contains explanations of several mathematical equations needed to provide estimates in this report.

Calculation of Effective Tax Rates

The effective tax rates in this paper are calculated by first determining, given a required after-tax rate of return and an expected rate of decline in productivity of the asset due to economic depreciation, how much the investment must initially produce in order for the sum of after-tax profits over time, discounted by the after-tax rate of return, to equal the investment outlay (i.e., to break even). Then all of the tax payments and deductions are eliminated and the before-tax profit flows are used to determine what pre-tax discount rate would sum the flows to the original cost. The effective tax rate is the pre-tax rate of return minus the after-tax rate of return, divided by the pre-tax rate.

Discounting means dividing each flow by a discount factor. For a flow earned a year from now, the discount factor is (**1** + R), for a flow earned two years from now (**1** + R),[2] for a flow three years from now (**1** + R),[3] where R is the discount rate. In practice, however, the analysis uses a continuous time method with continuous compounding. The formula derived from this method is

(1) $r = (R + d)(\mathbf{1} - u\mathbf{z}) / (\mathbf{1} - u) - d$

where r is the pre-tax rate of return, R is the after-tax real discount rate of the corporation, d is the economic depreciation rate, u is the statutory tax rate and z is the present value of depreciation deductions (discounted at $R + \pi$, where π is the inflation rate). The effective tax rate for an investment financed wholly by equity at the firm level is $(r - R) / r$.

When including individual level taxes and debt finance, the tax rate is measured by determining r as above, where $R = f(i(\mathbf{1} - u) - \pi) + (\mathbf{1} - f)E$, where f is the share of the investment that is debt financed, i is the nominal interest rate, and E is the real rate of return to equity before individual tax but after the corporate tax. The value of f is 0 when considering an equity investment and one when considering a debt-financed investment. E is equal to D + g, where D is the dividend rate and g is the real growth rate. The after-tax real rate of return, $R*$, is $f(i(\mathbf{1} - t) - \pi) + (\mathbf{1} - f)(D(\mathbf{1} -$ b) + $g(\mathbf{1} - c)$), where t is the effective individual tax rate b is the effective rate on dividends and c is the effective capital gains tax rate. The total tax rate is $(r - R*) / r$.

For a more complete description of the methodology and data sources, including useful lives for depreciation purposes, formulas for measuring z, and the allocation of assets in the economy see Jane G. Gravelle, *The Economic Effects of Taxing Capital Income*, Cambridge, MA, MIT Press, 1994.

For purposes of the analysis, the following assumptions were made: the interest rate is 7.5%, the inflation is 2%, and the real return to equity before individual taxes is 7%, with a 4% (or 57% of real profits) paid as dividends. The corporate rate is 35%, and the average individual marginal tax rate on investment income is 23% (data consistent with calculations in the National Bureau of Economic Research TAXSIM model). Tax rates on dividends and capital gains are 15%, although an alternative rate of 23.8% that applies to very high income individuals is also considered. One

half of corporate stock is sold; the remaining half held until death; and the holding period is five years. Half of financial assets are held in tax exempt forms such as pensions and IRAs.

How Partial Expensing Affects the Effective Tax Rate

The tax rate can be calculated for 50% expensing by measuring z in equation (1) as 0.5(1+z) meaning that half of the investment is expensed and half is depreciated in the normal way. There is a general relationship that can be found, which is helpful in understanding the effects of bonus depreciation by transforming the effect into a relationship between effective tax rates. To calculate this effect measure z as a combination of economic depreciation and excess depreciation in equation (1), noting that economic depreciation is equal to d/R+d so that z is redefined as z +d/(R+d) and z now represents the present value of depreciation in excess of economic depreciation. Solve this equation for the effective tax rate, u*:

(2) $u^* = [Ru-uz(R+d)]/(R-uz(R+d)$

When z is zero the tax rate is the statutory rate, u. The present value of depreciation with the 50% bonus provision is now 0.5(1+z+d/(R+d)). Solve equation (2) for z in terms of the other variables and replace z with this value to solve for the effective tax rate under bonus depreciation. The new tax rate with bonus depreciation, u_b is:

(3) $u_b = 0.5u^*/(1-0.5u^*)$

For typical effective tax rates the effective tax rate is reduced by somewhat over 40%.

Determining the Useful Life in the Camp Depreciation Proposal

Estimating the present value of depreciation for the Camp proposal requires not only the stated life, T, that is used to determine straight-line depreciation rate (1/T) but also the effective life when all of the cost is recovered. The limit of depreciation to original cost means that it is not an indexation of depreciation, but an acceleration, with the rate of acceleration rising as the inflation rate increases.

To determine the useful life in continuous time, integrate $e^{\pi t}/T$ from 0 to T*, with t representing time, and set that value equal to 1. T* is the point where 100% of the cost is recovered, T is the life for determining the straight line rate, and π is the inflation rate. Solving for the integral and making other transformations, the result is

$T^* = (\ln(1+ \pi T))/ \pi$.

Author Contact Information

Jane G. Gravelle
Senior Specialist in Economic Policy
jgravelle@crs.loc.gov, 7-7829