



November 21, 2013

Honorable Max Baucus
Chairman
Committee on Finance
United States Senate
Washington, DC 20510

Re: Information on the Depreciation of Assets

Dear Mr. Chairman:

This letter responds to a request by the committee staff that the Congressional Budget Office (CBO), in consultation with the staff of the Joint Committee on Taxation, provide information regarding the depreciation of tangible assets (the rate at which assets wear out or become obsolete). The current tax code contains a schedule of depreciation rates, with different rates assigned to different types of assets. Taxpayers use those rates to compute a depreciation deduction—that is, the dollar amount of asset depreciation that can be subtracted from their gross income—and thus reduce the amount of taxes they owe. Those tax depreciation rates, however, often differ from the rate of actual (or “economic”) depreciation.

The first item requested by the committee staff was a categorization into five groups of the asset classes specified by the Internal Revenue Service (in Revenue Procedures 87-56 and 88-22). Four of the groups (referred to as “pools” in the request) were defined by the committee staff largely in terms of a specified range of economic depreciation rates; the fifth group consists of real property, such as buildings, land, and certain other structures. In a few cases, the committee staff assigned certain types of assets to specific pools regardless of their economic depreciation rate. CBO computed the weighted average economic depreciation rate within each of the four pools. The list of asset classes in each group and the weighted average economic depreciation rates for the four pools are shown in Table 1.¹

The committee staff also asked CBO to make the following two adjustments to the weighted average rates of economic depreciation in each pool:

- The first was an adjustment for inflation. The average economic depreciation rates shown in Table 1 account for the decline in asset values

¹ The seven asset classes that were assigned by the committee staff based on factors other than their economic depreciation rates are shown in italics in Table 1.

over time in the absence of inflation. Over time, however, rising prices boost the nominal value of an asset—and thus the amount of its economic depreciation. Without an adjustment for inflation, the annual deduction would understate the nominal decline in the value of an asset during a tax year. When making this adjustment, CBO used a projected rate of inflation of 2.18 percent per year.

- The second was an adjustment to reflect a “half-year convention”—that is, an assumption that assets are, on average, placed in service on July 1. The rates shown in Table 1 reflect an assumption that all assets are placed in service on January 1. Accounting for the half-year convention, therefore, required a downward adjustment—the equivalent of disallowing six months of depreciation deductions during the first year of service.

The results of the two adjustments are shown in Table 2. On balance, the adjusted recovery rates derived by CBO are higher than the weighted average rates of economic depreciation. CBO estimates that the adjusted recovery rates for the four pools would be as follows:

Pool	Types of Assets Included	Range of Economic Depreciation Rates	Adjusted Recovery Rate
1	Machinery and equipment	Greater than or equal to 20 percent	38.14 percent
2	Machinery and equipment (except personal property with no class life)	Greater than or equal to 12 percent and less than 20 percent	17.69 percent
3	Machinery and equipment	Greater than or equal to 6 percent and less than 12 percent	12.21 percent
	Personal property with no class life	Not applicable	
4	Machinery and equipment	Less than 6 percent	4.76 percent
	Other assets, except for most types of real property	Not applicable	

The adjusted recovery rate for Pool 3 exceeds the maximum economic depreciation rate for machinery and equipment in that pool because of the adjustment for inflation and the inclusion of personal property with no class life (that is, property that is not explicitly addressed by the Treasury Department’s regulations governing depreciation deductions).

The third item requested by the committee staff concerns the depreciation schedule for real property (the fifth group). Real property is typically depreciated

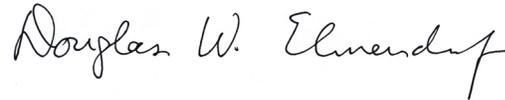
Honorable Max Baucus

Page 3

for tax purposes using a straight-line approach—that is, the difference between the initial cost of an asset and its scrap value at the end of its useful life, divided equally among the years in that period. CBO was asked to estimate the length of the period under the straight-line approach that would generate the same value of depreciation deductions for real property as would applying the average economic depreciation rate after adjusting for inflation. CBO estimates that period to be 43 years.

If you wish further details about these estimates, we will be pleased to provide them. The CBO staff contact is Paul Burnham.

Sincerely,

A handwritten signature in black ink that reads "Douglas W. Elmendorf". The signature is written in a cursive, flowing style.

Douglas W. Elmendorf
Director

cc: Honorable Orrin G. Hatch
Ranking Member

Table 1.
Asset Classes and Economic Depreciation Rates^a

Pool 1.

Machinery and equipment with economic depreciation rates of 20 percent or greater

Weighted Average Depreciation Rate^b	37.75
• Class 00.12 Information Systems	35.36
• Class 00.13 Data Handling Equipment, except Computers	22.29
• Class 00.22 Automobiles, Taxis	32.48
• Class 49.121 Electric Utility Nuclear Fuel Assemblies	44.65
• Unclassified Computer Software (purchased)	55.00

Pool 2.

Machinery and equipment with economic depreciation rates greater than or equal to 12 percent but less than 20 percent (except personal property with no class life)^c

Weighted Average Depreciation Rate	14.73
• Class 00.241 Light General Purpose Trucks	19.25
• Combination Other Trucks, Buses and Truck Trailers	17.98
o Class 00.242 Heavy General Purpose Trucks	
o Class 00.23 Buses	
o Class 00.26 Tractor Units for Use Over-The Road	
o Class 00.27 Trailers and Trailer-Mounted Containers	
• Combination Farms	12.78
o Class 01.1 Agriculture	
o Class 01.11 Cotton Ginning Assets	
o Class 01.21 Cattle, Breeding or Dairy	
o Class 01.221 Horses, Breeding or Work, 12 years old or less	
o Class 01.222 Horses, Breeding or Work, over 12 years old	
o Class 01.223 Horses, Racing, over 2 years old	
o Class 01.224 Horses, Other, over 12 years old	
o Class 01.225 Horses not in classes 1.221, 1.222, 1.223 or 1.224	
o Class 01.23 Hogs, Breeding	
o Class 01.24 Sheep and Goats, Breeding	
o Unclassified Tree or Vine Bearing Fruit or Nuts	
• Class 15.0 Construction	14.49
• Class 22.3 Manufacture of Medical and Dental Supplies ^d	13.33
• Class 24.1 Cutting of Timber	13.57
• Combination Manufacturing of Wood Products	13.88
o Class 24.2 Sawing of Dimensional Stock from Logs (permanent)	
o Class 24.3 Sawing of Dimensional Stock from Logs (temporary)	
o Class 24.4 Manufacture of Wood Products and Furniture	

Pool 2, continued

•	Combination	Manufacturing of Plastic and Rubber Products	12.95
○	Class 30.1	Manufacture of Rubber Products	
○	Class 30.2	Manufacture of Finished Plastic Products	
•	Combination	Manufacturing of Computer and Electronic Product	12.96
○	Class 36.0	Manufacture of Electronic Components, Products and Systems	
○	Class 36.1	Any Semiconductor Manufacturing Equipment	
•	Class 37.11	Manufacture of Motor Vehicles	13.47
•	Class 40.1	Railroad Machinery and Equipment	14.06
•	Class 41.0	Motor Transport—Passenger	13.55
•	Class 42.0	Motor Transport—Freight	13.82
•	Combination	Telephone Communication Equipment	14.95
○	Class 48.12	Telephone Central Office Equipment	
○	Class 48.121	Computer-based Telephone Central Office Switching Equipment	
○	Class 48.13	Telephone Station Equipment	
•	Class 48.2	Radio and Television Broadcasting	14.95
•	Combination	Other Telecommunications Equipment	14.95
○	Class 48.32	Telegraph, Ocean Cable, and Satellite Communications (TOCSC)— High Frequency Radio and Microwave Systems	
○	Class 48.34	TOCSC—Central Office Control Equipment	
○	Class 48.35	TOCSC—Computerized Switching, Channeling and Associated Control Equipment	
○	Class 48.37	TOCSC—Satellite Space Segment Property	
○	Class 48.38	TOCSC—Equipment Installed on Customer’s Premises	
○	Class 48.39	TOCSC—Support and Service Equipment	
•	Class 57.0	Distributive Trades and Services	13.65
•	Class 57.0	Appliances, Carpets, Furniture used in Residential Rental Real Estate Activity	15.02
•	Class 79.0	Recreation	13.77
•	Unclassified	Qualified Rent-to-Own Property	15.17

Pool 3.

Machinery and equipment with economic depreciation rates greater than or equal to 6 percent but less than 12 percent, and personal property with no class life^c

Weighted Average Depreciation Rate			9.72
•	Class 00.11	Office Furniture, Fixtures, and Equipment	11.40
•	Class 00.21	Airplanes (not used for commercial transport) and Helicopters	7.88
•	Class 00.28	Vessels, Barges, Tugs and Similar Water Transportation Equipment	6.11
•	Class 10.0	Mining	9.78

Pool 3, continued

- Combination Oil and Gas Drilling 7.62
 - Class 13.0 Offshore Drilling
 - Class 13.1 Drilling of Oil and Gas Wells
- Class 13.2 Exploration for and Production of Petroleum and Natural Gas Deposits 7.50
- Class 13.3 Petroleum Refining 8.50
- Combination Manufacturing of Grain, Sugar, and Vegetable Oil Products 9.53
 - Class 20.1 Manufacture of Grain and Grain Mill Products
 - Class 20.2 Manufacture of Sugar and Sugar Products
 - Class 20.3 Manufacture of Vegetable Oils and Vegetable Oil Products
- Combination Manufacturing of Other Food, Beverage, and Tobacco Products 9.46
 - Class 20.4 Manufacture of Other Food and Kindred Products
 - Class 21.0 Manufacture of Tobacco and Tobacco Products
- Class 20.5 Manufacture of Food and Beverages—Special Handling Devices 8.16
- Combination Manufacturing of Knitted Goods, Carpets, and Textile Finishing 10.55
 - Class 22.1 Manufacture of Knitted Goods
 - Class 22.3³ Manufacture of Carpets
Dyeing, Finishing and Packaging of Textile Products
 - Class 22.4 Manufacture of Textile Yarns
- Combination Manufacturing of Other Textile Products 10.55
 - Class 22.2 Manufacture of Yarn, Thread, and Woven Fabric
 - Class 22.5 Manufacture of Nonwoven Fabrics
- Class 23.0 Manufacture of Apparel and Other Finished Products 11.38
- Combination Manufacturing of Paper Products 10.50
 - Class 26.1 Manufacture of Pulp and Paper
 - Class 26.2 Manufacture of Converted Paper, Paperboard, and Pulp Products
- Class 27.0 Printing, Publishing, and Allied Industries 11.30
- Class 28.0 Manufacture of Chemicals and Allied Products 11.29
- Combination Manufacturing of Plastic and Rubber Products—Special Tools 11.79
 - Class 30.11 Manufacture of Rubber Products—Special Tools and Devices
 - Class 30.21 Manufacture of Finished Plastic Products—Special Tools and Devices
- Class 31.0 Manufacture of Leather and Leather Products 11.38
- Class 32.1 Manufacture of Glass Products 9.95
- Class 32.11 Manufacture of Glass Products—Special Tools 8.68
- Class 32.2 Manufacture of Cement 9.56
- Class 32.3 Manufacture of Other Stone and Clay Products 9.56
- Class 33.2 Manufacture of Primary Nonferrous Metals 7.43
- Class 33.21 Manufacture of Primary Nonferrous Metals— Special Tools 6.11

Pool 3, continued

•	Combination	Manufacturing of Primary Ferrous Metals	7.34	
	○	Class 33.3	Manufacture of Foundry Products	
	○	Class 33.4	Manufacture of Primary Steel Mill Products	
•	Class 34.0	Manufacture of Fabricated Metal Products	8.33	
•	Class 34.01	Manufacture of Fabricated Metal Products—Special Tools	6.88	
•	Class 35.0	Manufacture of Electrical and Nonelectrical Machinery and Other Mechanical Products	8.09	
•	Class 37.12	Manufacture of Motor Vehicles—Special Tools	11.79	
•	Combination	Manufacturing of Other Transportation Equipment	11.38	
	○	Class 37.2	Manufacture of Aerospace Products	
	○	Class 37.41	Manufacture of Locomotives	
	○	Class 37.42	Manufacture of Railroad Cars	
•	Class 37.31	Ship and Boat Building Machinery and Equipment	11.43	
•	Class 37.33	Ship and Boat Building—Special Tools	9.71	
•	Class 39.0	Manufacture of Athletic, Jewelry, and Other Goods	11.81	
•	Combination	Air Transportation	6.88	
	○	Class 45.0	Air Transport	
	○	Class 45.1	Air Transport (restricted)	
•	Combination	Cable Television Communications Equipment	11.00	
	○	Class 48.43	Cable Television—Program Origination	
	○	Class 48.44	Cable Television—Service and Test	
	○	Class 48.45	Cable Television—Microwave Systems	
•	<i>Unclassified</i>	<i>Personal Property with no class life</i>	<i>14.63</i>	

Pool 4.

Machinery and equipment with economic depreciation rates of less than 6 percent, all asset classes that explicitly include grading or land improvements (but not real property), all Section 1245 real property with no class life (not otherwise assigned to pools 1-3 or to the real property group), and all asset classes primarily consisting of property used in the transmission and distribution of electricity or steam, and all asset classes primarily used in the transmission of telecommunication services

Weighted Average Depreciation Rate **3.57**

•	Class 00.25	Railroad Cars and Locomotives (except those owned by rail transport companies)	5.89
•	Class 00.3	Land Improvements	2.25
•	Class 00.4	Industrial Steam and Electric Generation and/or Distribution Systems	5.02
•	Class 37.32	Ship and Boat Building Dry Docks and Land Improvements	2.25
•	Class 40.3	Railroad Wharves and Docks	2.25

Pool 4, Continued

- Class 40.4 Railroad Tracks 2.49
- *Class 44 Water Transportation^e* 6.92
- Class 46 Pipeline Transportation 5.50
- Class 48.14 Telephone Distribution Equipment 2.37
- Combination Other Communications Distribution Systems 4.34
 - Class 48.31 TOCSC—Electric Power Generating and Distribution Systems
 - Class 48.33 TOCSC—Cable and Long-line Systems
- Class 48.36 TOCSC—Satellite Ground Segment Property 2.37
- Combination Cable Television Distribution Systems 2.71
 - Class 48.41 Cable Television—Headend
 - Class 48.42 Cable Television—Subscriber Connection and Distribution Systems
- *Class 49.14 Electric Utility Transmission and Distribution Plant* 6.66
- Combination Natural Gas Distribution and Steam Supply 2.85
 - Class 40.54 Railroad Steam, Compressed Air, and Other Power Plant Equipment
 - Class 49.21 Gas Utility Distribution Facilities
 - Class 49.4 Central Steam Utility Production and Distribution
- Class 49.24 Gas Utility Trunk Pipelines and Related Storage Facilities 2.37
- Combination Water Supply and Sewage Treatment 2.34
 - Class 49.3 Water Utilities
 - Class 51.0 Municipal Sewer
- Class 57.1 Distributive Trades and Services—Billboard, Service Station Buildings, and Petroleum Marketing Land Improvements 3.96
- Class 80.0 Theme and Amusement Parks 5.60
- Unclassified Wind and Solar Energy Structures 3.03
- Asset types explicitly placed in the pool for which no average depreciation rate could be calculated
 - Class 40.51 *Railroad Hydraulic Electric Generating Equipment*
 - Class 40.52 *Railroad Nuclear Electric Generating Equipment*
 - Class 40.53 *Railroad Steam Electric Generating Equipment*
 - *Unclassified Section 1245 Real Property with no class life*

Real Property

- Class 01.3 Farm Buildings
- Class 01.4 Other Single Purpose Agricultural or Horticultural Real Properties
- Class 40.2 Railroad Real Properties and Similar Improvements
- Class 48.11 Telephone Central Office Buildings
- Class 49.11 Electric Utility Hydraulic Production Plant
- Class 49.12 Electric Utility Nuclear Production Plant
- Class 49.13 Electric Utility Steam Production Plant

Real Property, Continued

- Class 49.15 Electric Utility Combustion Turbine Production Plant
 - Class 49.221 Gas Utility Manufactures Gas Production Plant
 - Class 49.222 Gas Utility Substitute Natural Gas Production Plant
 - Class 49.223 Substitute Natural Gas—Coal Gasification
 - Class 49.23 Natural Gas Production Plant
 - Class 49.25 Liquefied Natural Gas Plant
 - Class 49.5 Waste Reduction and Resource Recovery Plants
 - Class 50.0 Municipal Wastewater Treatment Plant
 - Unclassified Residential Rental Property
 - Unclassified Nonresidential Rental Property
 - Unclassified Cellulosic Biofuel Plant Property
-

Notes: The rates in this table are economic depreciation rates, not the adjusted recovery rates that would be used to determine the nominal depreciation amount in each year. The adjusted recovery rates, which account for inflation and the half-year convention (the assumption that an asset would be placed in service in the middle of the year), are displayed in Table 2.

The asset classes are defined in Revenue Procedures 87-56 and 88-22, issued by the Internal Revenue Service (IRS) and are summarized in Appendix B of IRS Publication 946 (www.irs.gov/pub/irs-pdf/p946.pdf). The U.S. Bureau of Economic Analysis (BEA) computes economic depreciation rates for most asset types, which occasionally vary by industry (see *BEA Depreciation Estimates*, 2004, www.bea.gov/national/FA2004/Tablecandtext.pdf). For asset types not covered in that document, CBO estimated economic depreciation rates by dividing the BEA's estimates of "Current Cost Depreciation" by its estimates of "Current Cost Net Stocks" for 2007 (available at www.bea.gov/National/FAweb/Details/Index.html).

The IRS's asset classes do not correspond to the asset types reported by BEA, so CBO, in consultation with the staff of the Joint Committee on Taxation, mapped the IRS asset classes into the BEA asset types and industries. That effort built on work done previously by CBO for the 2006 background paper *Computing Effective Tax Rates on Capital Income* (www.cbo.gov/publication/18259). That mapping was used to identify all of the economic depreciation rates associated with an asset class, and CBO calculated a weighted average of them for each. Asset values in each asset type/industry cell associated with the asset class served as the weights in that calculation. For most asset types and industries, CBO used BEA's estimates of "Current Cost Net Stocks" for 2007 as measures of their value. That information, however, was not available for all asset types. In such cases, CBO estimated the asset value using industry-level data on assets, capital expenditures, or gross receipts reported in the *2007 Economic Censuses* (available at www.census.gov/econ/census07/).

- a. The committee staff assigned certain types of assets to specific pools based on factors other than their rate of economic depreciation. Those asset classes are shown in italics in the table.
 - b. CBO estimated the average weighted depreciation rate for each of the four pools by weighting the economic depreciation rate for each asset class by the value of assets in that class.
 - c. "Personal property with no class life" refers to property that is not explicitly addressed by the Treasury Department regulations governing depreciation deductions (Revenue Procedures 87-56 and 88-22).
 - d. Class 22.3 includes "Manufacture of Medical and Dental Supplies" and "Manufacture of Carpets." In this table, those two categories were placed in Pools 2 and 3, respectively, based on their depreciation rates.
 - e. Includes land improvements.
-

Table 2.
Adjusted and Unadjusted Weighted Average Depreciation Rates by Pool
(Percent)

	Unadjusted	Adjusted for Inflation	Adjusted for Inflation and Half-Year Convention
Pool 1	37.75	46.02	38.14
Pool 2	14.73	19.54	17.69
Pool 3	9.72	13.15	12.21
Pool 4	3.57	4.94	4.76

Notes: The committee staff asked CBO to adjust the weighted average depreciation rates for inflation and the “half-year convention.” To account for inflation, CBO identified a depreciation rate that would yield the same present discounted value of depreciation deductions over time as the unadjusted weighted average depreciation rates would yield in the absence of inflation. (A present value is a single number that expresses a flow of current and future income, or payments, in terms of a lump sum received, or paid, today.) To incorporate the half-year convention—which reflects an assumption that assets are, on average, placed in service at midyear—CBO applied a downward adjustment to the depreciation rate so that the present value of depreciation deductions over time matched that yielded when using the unadjusted rates, but disallowing six months of depreciation in the first year.

The present value depends on the discount rate that is used to translate future cash flows into current dollars.

When computing present values, CBO used a real discount rate (that is, before inflation) of 5.01 percent. That represents a weighted average of projected rates of return on debt- and equity-financed investments by both incorporated and unincorporated businesses. The rate of return on debt-financed investments is based on the rate for Baa rated corporate bonds. The rate of return on equity-financed investments is based on the rate for 10-year Treasury bonds plus an equity premium. Debt-financing was assumed to account for 32 percent of corporate investment and 29 percent of noncorporate investment.

For inflation, CBO assumed a rate of 2.18 percent, which is the forecasted average change in the Consumer Price Index for All Urban Consumers (CPI-U) between 2013 and 2023 according to CBO’s baseline economic forecast from February 2013 (available at www.cbo.gov/publication/43902).