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U.S. Cost of Capital Model Methodology

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This paper provides a detailed description of Treasury's U.S. cost of capital model. U.S. effective marginal tax rates (EMTRs) for 2021 through 2031 are calculated for current law. These EMTRs take account of the extension and subsequent phase out of bonus depreciation with a methodology used by Cohen, Hansen, and Hassett (2002) to estimate the user cost of capital under a temporary bonus depreciation. The EMTRs also take account of several changes in current law over the 10-year period. Those changes include of the expiration (sunset) of most of the 2017 Tax Cut and Jobs Act's individual provisions at the end of calendar year 2025 and the replacement of expensing for research and experimentation (R&E) intangibles with amortization in 2022. They also include the switch in the limitation on interest deductions from earnings before interest, tax, depreciation, and amortization (EBITDA) definition of adjusted taxable income to an earnings before interest and tax (EBIT) definition in 2022.

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A U.S. cost of capital model is used to calculate U.S. effective marginal tax rates (EMTRs) on new domestic investment. The model is used to determine how uniformly and heavily the federal government taxes capital income under current law and how that taxation would be affected by changes in tax policy.

I. Current-law provisions modeled for budget period 2021 through 2030

The 2017 Tax Cuts and Jobs Act (TCJA) combines individual and business tax reform. EMTRs from the U.S. cost of capital model include many of the provisions comprising those reforms.

With respect to individual tax reform, the TCJA eliminates or modifies many deductions and exclusions, including the repeal of the home mortgage interest (HMI) deduction for interest on mortgage debt in excess of $750,000 and the state and local tax (SALT) deduction for state and local taxes (e.g., real estate taxes, state and local income taxes) exceeding $10,000. The TCJA also eliminates personal exemptions but nearly doubles the standard deduction for singles, married filing jointly, and heads of households. It revises the tax brackets, lowers statutory personal income tax rates for most brackets, and raises individual exemption amounts and phase-out thresholds for the individual alternative minimum tax (AMT). It allows for a 20-percent deduction of domestic, pass-through business income of individuals, subject to certain limitations. On balance, the TCJA lowers marginal tax rates on ordinary income but only through the end of calendar year 2025, when most of the provisions comprising the individual tax reform sunset and prior tax law is reinstated beginning in January 2026. The use of the chained consumer price index (CPI) for indexing tax parameters is one notable exception to the temporary nature of the changes to the individual income tax. The TCJA makes chained CPI indexing permanent.

With respect to the business tax reform, the TCJA permanently replaces the prior corporate income tax rate schedule with its top rate of 35 percent with a flat 21-percent corporate income tax rate. It also eliminates both the Domestic Production Activities Deduction and the corporate AMT. It seeks to encourage new investment with both a permanent increase in Section 179 expensing and an extension and expansion of bonus depreciation for qualified property, the same property to which bonus depreciation has applied under prior law.[1] One-hundred-percent expensing of qualified property applies for 2021 and 2022, after which it is phased out at a rate of 20 percentage points per year. The TCJA also replaces expensing of R&E intangibles with amortization over a 5-year period beginning in 2022 and limits interest deductions to 30 percent of adjusted taxable income for corporate and noncorporate debt. For 2021, adjusted taxable

[1] MACRS is the Modified Acceleration Cost Recovery System. For the purposes of bonus depreciation, qualified property (investment) includes property that is depreciable under MACRS and has a recovery period of 20 years or less, MACRS water utility property, and computer software depreciable over 3 years. Qualifying property under bonus depreciation is comparable to qualifying investment for purposes of Section 179. A bonus depreciation deduction is claimed on the basis of qualifying property after reduction for any Section 179 deductions. Under prior law Section 179, taxpayers could elect to expense qualifying property up to a maximum deduction of $500,000 (the limitation). The Section 179 deduction was phased out dollar-for-dollar if qualified investment exceeded $2 million (the phase out threshold). Under the TCJA, the maximum amount that a taxpayer may expense increases to $1 million and the phase-out threshold increases to $2.5 million. The Section 179 deduction is also limited by a taxpayer's taxable income.

income is calculated as earnings before interest, tax, depreciation, and amortization (EBITDA); beginning in 2022, it is computed as earnings before interest and tax (EBIT).

1. Extension and expansion of bonus depreciation for qualified property.

Under the TCJA, 100 percent of the basis of qualified property can be deducted in 2021 and 2022, 80 percent in 2023, 60 percent in 2024, 40 percent in 2025, and 20 percent in 2026. However, bonus depreciation is elective and the effective marginal tax rate calculations do not assume that the maximum amount that may be deducted is taken as a deduction. The percent of the basis that is deducted (the expensing percentage) can be approximated using data for 2002 through 2014 published in Kitchen and Knittel (2016).[2] We use the nonpublic IRS corporate and individual tax files to extend the data in Kitchen and Knittel (2016) through 2016.

A bonus depreciation expensing percentage for a given year is calculated by multiplying the bonus depreciation rate (e.g., 100 percent in 2022, 80 percent in 2023) by a bonus take-up percentage.[3] Table 4 in Kitchen and Knittel (2016) shows the data needed to calculate bonus take-up percentages for C-corporations. Similarly, Table 5 through Table 7 give the data needed to calculate bonus take-up percentages for pass-through businesses (S-corporations, partnerships, and individuals).[4] The bonus take-up percentage is the percent of the basis of qualified property on which bonus depreciation is claimed.[5] It is the grossed up bonus amount claimed divided by the total 'equipment and software' basis in Table 4 through Table 7 in Kitchen and Knittel (2016).[6] The gross up factor is the bonus depreciation rate. The average bonus take-up rate between 2012 and 2016 is 67 percent for C-corporations and 44 percent for pass-through entities. Between 2014 and 2016, the average bonus take-up rate is 64 percent for C-corporations[7] and 43 percent for pass-through entities.[8]

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[2] See Table 4 through Table 7 on pp. 21-24 in Kitchen and Knittel (2016). Table 4 through Table 7 give bonus take-up percentages for 2002 through 2014. John Kitchen and Matthew Knittel, 2016, 'Business Use of Section 179 Expensing and Bonus Depreciation, 2002-2014', Office of Tax Analysis Working Paper 110, October, available at https://home.treasury.gov/system/files/131/wp-110.pdf.

[3] Hence, the bonus depreciation expensing percentage is 100 percent for 2021 and 2022 if the take-up rate for bonus depreciation among businesses is 100 percent.

[4] Individuals include sole proprietors, farmers, and rental real estate.

[5] The calculation of the bonus take-up percentage in this paper differs slightly from Kitchen and Knittel (2016). In Table 4 through Table 7, Kitchen and Knittel (2016) use the total basis eligible for bonus in the denominator of the bonus take-up percentage and not the total 'equipment and software' basis. The total basis eligible for bonus has been adjusted for Section 179 allowances. However, the expensing percentages used in the cost of capital model include both bonus depreciation and Section 179 expensing. To add an expensing percentage for bonus depreciation to an expensing percentage for Section 179, the two expensing percentages need a common denominator. That common denominator is the total 'equipment and software' basis.

[6] The total 'equipment and software' basis is Kitchen and Knittel (2016) includes some National Income and Product Accounts (NIPA) structures. See Table 8 (p. 25) in Kitchen and Knittel (2016).

[7] Bonus take-up percentages vary from year to year. Between 2012 and 2016, the bonus depreciation rate was 50 percent in every year. However, the bonus take-up percentage for C-corporations was almost 76 percent in 2012 but between 63 percent and 66 percent between 2013 and 2016. An average rate of 64 percent is used in the cost of capital model.

[8] The bonus take-up rate for pass-through businesses was 47 percent in 2013 and approximately 43 percent in 2014 and 2016. An average rate of 43 percent is used in the cost of capital model.

The expensing percentages used in the cost of capital model take account of both bonus depreciation and Section 179 expensing. The expensing percentages assumed for Section 179 are not large because of low take-up rates, particularly for C-corporations.[9] The average Section 179 expensing percentage for C-corporations is 1.8 percent between 2012 and 2016 and 1.7 percent between 2014 and 2016. The average expensing percentage for pass-through businesses is 15.5 percent between 2012 and 2016 and 15.1 percent between 2014 and 2016. Experience suggests that businesses are less likely to use Section 179 when 100-percent bonus depreciation is available. For example, in 2011, the bonus depreciation rate was 100 percent, and the Section 179 expensing percentage was 1.5 percent for C-corporations and 15.2 percent for pass-through businesses. As a result, the effective marginal tax rate calculations are consistent with assuming a Section 179 expensing percentage of 1.7 percent for C-corporations and 15.1 percent for pass-through businesses.

Summing the Section 179 expensing percentage with the bonus depreciation expensing percentage gives the total expensing percentage used in the cost of capital model. The total expensing percentage is 65.7 percent for C-corporations and 58.1 percent for pass-through businesses in 2021 and 2022, implying that 65.7 percent of the C-corporation depreciation basis and 58.1 percent of the pass-through depreciation basis are being deducted immediately. The total expensing percentage drops in later years as bonus depreciation phases out. The percentage falls to 52.9 percent for C-corporations and 49.5 percent for pass-through businesses in 2023, to 40.1 percent for C-corporations and 40.9 percent for pass-through businesses in 2024, to 27.3 percent for C-corporations and 32.3 percent for pass-through businesses in 2025, and to 14.5 percent for C-corporations and 23.7 percent for pass-through businesses in 2026. For 2027, the total expensing percentage used in the cost of capital model includes only the Section 179 expensing percentage.

2. Limitation on interest deductions.

The TCJA limits deductions for interest expense to 30 percent of adjusted taxable income plus business interest. Broadly speaking, for 2021, the TCJA defines adjusted taxable income as taxable income computed without regard to deductions for interest, depreciation, amortization, and depletion (EBITDA). After 2021, the TCJA defines adjusted taxable income as taxable income computed without regard to deductions for interest (EBIT). Because it does not include deductions for depreciation, amortization, and depletion, adjusted taxable income defined using EBIT implies a larger reduction in the interest deduction than does an EBITDA-based definition of adjusted taxable income. In the cost of capital model, this means that there is an increase in the share of interest paid that cannot be deducted (the disallowance share) in 2022 as compared to the share of interest that cannot be deducted in 2021.

[9] In this paper, the Section 179 take-up percentage is calculated as the ratio of the total 179 deduction claimed and the total 'equipment and software' basis. In Kitchen and Knittel (2016), it is calculated as the ratio of the total 179 deduction claimed and the total basis eligible for Section 179. For C-corporations, the total basis eligible for Section 179 is a small fraction of the total 'equipment and software' basis. Hence, Table 4 of Kitchen and Knittel (2016) reports a '179 takeup percentage' for C-corporations in 2010 of 34 percent if calculated relative to eligible basis. The take-up percentage for C-corporations in 2010 is 1.8 percent if calculated relative to the total 'equipment and software' basis.

There are exceptions to TCJA's limitations on interest deductions. For example, the limitation on interest deductions does not apply to businesses with gross receipts that are less than or equal to $25 million.[10] The limitation on interest deductions does not apply to regulated public utilities.[11] For small businesses and regulated public utilities, the allowed interest deduction is the total interest paid. In addition, farms and real property trade and business (real estate) can elect out of the limitation on interest deductions.[12] However, farms that elect out of the limitation are required to use the Alternative Depreciation System (ADS) for property with a recovery period of 10 years or more and real property trade and business is required to use the ADS for real property.[13] The effective marginal tax rate calculations assume that farms and real property trade and business elect out of the limitation on interest deductions and use the ADS.[14]

Finally, business interest is interest income included in gross income that is properly allocable to a trade or business, i.e., business interest income does not include investment interest income.[15] The Internal Revenue Service (IRS) treats all interest includible in gross income by a C-corporation as business interest income for purposes of the limitation on interest deductions. However, for S-corporations, Regulated Investment Companies (RICs), and Real Estate Investment Trusts (REITs), the cost of capital model assumes that interest income is only business related in the case of finance and insurance businesses.[16] For non-C-corporation nonfinancial businesses, this means that the cost of capital model assumes that the allowed interest deduction is 30 percent of adjusted taxable income. For non-C-corporation finance and insurance businesses, it means that the allowed interest deduction is 30 percent of adjusted taxable income plus business interest.[17]

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[10] Specifically, average annual gross receipts over 3 tax years should be less than or equal to $25 million for the small business exception to apply.

[11] In the cost of capital model, the exception for regulated public utilities is assumed to apply to all of utilities (North American Industry Classification System (NAICS) code 22). The extension and expansion of bonus depreciation for qualified property does not apply to regulated public utility property.

[12] A real property trade or business is any real property development, redevelopment, construction, reconstruction, acquisition, conversion, rental, operation, management, leasing, or brokerage trade or business (26 U.S. Code Section 469(c)(7)(C)). In the cost of capital model, real property trade and business is identified as real estate (NAICS code 531).

[13] Under TCJA, the ADS recovery period for nonresidential buildings is 40 years while the ADS recovery period for tenant-occupied residential buildings is 30 years. The straight-line method is used with ADS recovery periods.

[14] The effective marginal tax rate calculations also assume that all farms elect to use the 150-percent declining balance method under the TCJA.

[15] Investment income is the gross income of property held for investment plus net capital gains from the disposition of property held for investment. Property held for investment includes property that produces interest, dividends, annuities, or royalties that are not derived in the ordinary course of trade or business and an interest held in an activity involving the conduct of trade or business which is not passive but with respect to which the taxpayer does not participate materially (26 U.S. Code Section 163(d)(5)(A)).

[16] For purposes of the limitation on interest deductions, finance and insurance businesses are defined as follows: credit intermediation (NAICS code 522); securities, commodity contracts, and other financial investments (NAICS code 523); insurance carriers (NAICS code 524); funds, trusts, and other financial vehicles (NAICS code 525); and bank holding companies (NAICS code 551111).

[17] Disallowance shares are calculated for the 54 industries that make up the cost of capital model using the variable for interest income on IRS Forms 1120, 1120-F, 1120-L, 1120-PC, 1120-REIT, 1120-RIC, and 1120S from the nonpublic IRS corporate study tax file.

The calculated disallowance shares vary by industry and sector, with the finance and insurance industries having some of the lowest shares.[18] For C-corporations for 2021, the average disallowance share for nonfinancial businesses (excluding utilities, farms, and real estate) is 16.6 percent compared to 1.3 percent for finance and insurance businesses. The average C-corporation disallowance share for all 54 industries is 9.2 percent. For C-corporations from 2022 to 2027, the average disallowance share for businesses classified as nonfinancial (excluding utilities, farms, and real estate) is 27.8 percent compared to 1.8 percent for finance and insurance businesses. The average C-corporation disallowance share for all 54 industries is 15.20 percent.[19] Disallowance shares for all 54 industries are generally lower for S-corporations, RICs, and REITs. For 2021, the average non-C-corporation disallowance share for all 54 industries is 5.4 percent. From 2022 to 2027, it is 8.6 percent.[20]

II. Model description

The U.S. cost of capital model[21] includes 76 depreciable assets (equipment, nonresidential structures, and tenant-occupied residential structures), land, inventories, and intangibles (research and development (R&D), artistic originals, and advertising) for 54 industries based on North American Industry Classification System (NAICS) codes.[22] Stock values for all categories of assets except land, inventories, and advertising are taken from the detailed fixed asset tables published by the U.S. Bureau of Economic Analysis (BEA).[23] These stock values are used to weight the user cost of capital by asset type and industry. EMTRs are typically calculated for a corporate (C-corporation) business sector, a pass-through business sector (S-corporations, RICs, REITs, partnerships, and sole proprietorships), and an owner-occupied housing sector using a

[18] For purposes of the cost of capital model, sector is defined in the next section.
[19] Industry categories correspond to the IRS industry classification, which generally follows NAICS. The classification of a corporation to an industry is based on its primary business activity. The determination for corporations filing a consolidated tax return is based on the primary business activity for the group as a whole, as determined by the Statistics of Income (SOI) division of the IRS.
[20] Average disallowance shares for S-corporations, Regulated Investment Companies (RICs), and Real Estate Investment Trusts (REITs) are higher if farms and real property trade and business are not assumed to elect out of the limitation on interest deductions. For 2021, the average non-C-corporation disallowance share for all 54 industries is 9.4 percent. For 2022 through 2027, it is 15.9 percent.
[21] For a description of the cost of capital methodology, see Fullerton, Gillette, and Mackie (1987), Gravelle (1994), and Ozanne and Burnham (2006). Don Fullerton, Robert Gillette, and James Mackie, James, 1987, 'Investment Incentives under the Tax Reform Act of 1986', in Office of Tax Analysis (eds), *Compendium of Tax Research 1987*, Washington, DC: Department of the Treasury, Office of Tax Policy, pp. 131-171; Jane G. Gravelle, 1994, *The Economic Effects of Taxing Capital Income*, Cambridge, MA: The MIT Press; and Larry Ozanne and Paul Burnham, 2006, 'Computing Effective Tax Rates on Capital Income', Congressional Budget Office Background Paper, December, available at https://www.cbo.gov/publication/18259.
[22] The cost of capital model includes 15 different types of research and development (R&D) and 5 different types of artistic originals. The artistic originals include theatrical movies, long-lived television programs, books, music, and other (theatrical plays, greeting cards, and stock photos). See the U.S. Bureau of Economic Analysis (BEA) detailed, current-cost estimates of the net stocks of nonresidential fixed assets at https://apps.bea.gov/national/FA2004/Details/Index.htm for a listing of the 15 different types of R&D.
[23] See the detailed, current-cost estimates of the net stocks of residential and nonresidential fixed assets at https://apps.bea.gov/national/FA2004/Details/Index.htm. BEA detailed fixed asset data for 2016 are used in the cost of capital model. Bureau of Labor Statistics (BLS) data are used to obtain the stock of wealth in land in the manufacturing, agricultural, and nonfarm nonmanufacturing sectors. NIPA data are used to provide values for inventories. Tax data for advertising deductions are used to obtain a net stock of advertising.

weighted-average user cost of capital.[24] For C-corporations, they are also calculated for new investment financed with debt and new investment financed with equity.

1. Corporate and pass-through businesses.

EMTRs on new investments are hypothetical tax rates showing the total fraction of capital costs, excluding economic depreciation, needed to pay taxes over the lifetime of a marginal investment. If applied to economic income, they summarize the impact of major tax provisions on the investment incentives of businesses and investors. All else being equal, a higher effective tax rate is consistent with a lower incentive to save and invest. The effective marginal tax rate including only firm-level taxes is

$$(1) \qquad EMTR' = (\rho - r')/\rho,$$

where ρ is the user cost of capital net of economic depreciation and r' is the real after-tax rate of return to the marginal investor.[25] The user cost of capital is the real before-tax rate of return that a marginal investment must earn to recover the cost of the investment, pay taxes, and pay an expected after-tax rate of return on marginal saving. For equipment, structures, and intangibles, the user cost of capital net of economic depreciation is

$$(2) \qquad \rho = \Big((r+\delta)\cdot\big(1-k-A(1-k)\big)\Big)/(1-\tau) - \delta,$$

where r is the firm's real discount rate, δ is the economic depreciation rate, k is an investment tax credit rate, and A is the present value of the tax benefit from depreciation allowances.[26] In equation (2),

$$(2a) \qquad A = \sum_{z=1}^{Y}(1+r)^{-z}\tau_z D_z,$$

where Y is the recovery period, τ is the federal business income tax rate, and D denotes the depreciation allowance per dollar of investment.[27] Omitting τ from equation (2a) gives the present value of depreciation for tax purposes. Depreciation allowances per dollar of investment for the tax recovery periods and methods listed in Table 2 are taken from Appendix A (pp. 67-94) of IRS (2019) Publication 946.[28] The depreciation rate tables included in Appendix A of IRS (2019) Publication 946 incorporate applicable convention (e.g., the half-year convention for depreciable equipment, the mid-month convention for depreciable structures) and depreciation methods. Allowing for bonus depreciation,

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[24] Both RICs and REITs are treated as pass-through businesses in the cost of capital model. RICs are included in NAICS code 525. REITs are included in NAICS code 525 (funds, trusts, and other financial vehicles) and NAICS code 531 (real estate).

[25] In equation (1), the real after-tax rate of return to the marginal investor is a weighted average of the required (pre-tax) real return on equity and a nominal market interest rate. It is identical to equations (3a) and (3b) if the share of business interest expenses that can be deducted is set to zero.

[26] In Table 1, k is the marginal effective investment tax credit rate on research and development.

[27] The present value of the tax benefit from depreciation allowances is calculated on a discrete basis to take account of the expiration of the 20-percent deduction of pass-through business income at the end of calendar year 2025.

[28] Internal Revenue Service, 2019, *Publication 946 How to Depreciate Property, for Use in Preparing 2018 Returns,* available at http://www.irs.gov/pub/irs-pdf/p946.pdf.

(2b) $A = x\tau_1 + (1-x)\sum_{z=1}^{Y}(1+r)^{-z}\tau_z D_z$,

where x is the expensing percentage discussed in the previous section.

In the cost of capital model, ρ is calculated by sector, industry, and asset type.[29] The user cost of capital for land and inventories excludes tax depreciation. The economic depreciation rate for land and inventories is set to zero. For inventories, the effective marginal tax rate is calculated using a cost of capital that is a weighted average of the cost of capital under last in, last out (LIFO) accounting and the cost of capital under first in, first out (FIFO) accounting.[30]

For a corporate business, the firm's real discount rate in equation (2) is the weighted average of a required (pre-tax) real return on equity (E_c) and a nominal market interest rate (i). Thus,

(3a) $r_c = f_c(i(1-\gamma_c\tau_c)-\pi) + (1-f_c)E_c$,

where f_c is the fraction of marginal corporate investment financed with debt and γ_c the share of corporate business interest expenses that can be deducted.[31] For a pass-through business, the firm's real discount rate is

(3b) $r_{pt} = f_{pt}\big(i\big(1-\gamma_{pt}\tau_{pt}\big)-\pi\big) + \big(1-f_{pt}\big)sce$,

where the after-tax rate of return on corporate equity (sce) replaces E_c in equation (3a). The after-tax rate of return on corporate equity is used so that pass-through business owners have no incentive to shift equity between their pass-through business and corporate equities to equalize marginal returns. The after-tax rate of return on corporate equity is a weighted average of the after-tax rate of return on corporate equity held in fully-taxable accounts $(sceft)$ (e.g., directly-held corporate stocks), temporarily-deferred accounts $(scetd)$ (e.g., annuities, whole-life insurance policies), and nontaxable accounts $(scent)$ (e.g., pension funds). Thus,

(4) $sce = \alpha_{ceft}\cdot sceft + \alpha_{cetd}\cdot scetd + \alpha_{cent}\cdot scent$.[32]

The after-tax rate of return on corporate equity in fully taxable accounts is a function of the share of after-tax profit retained by C-corporations, the federal tax rate on dividends, and the real

[29] The EMTRs by sector and broad asset type (e.g., equipment, structures, intangibles) in Table 4 and Table 5 are calculated using weighted-average values of ρ. Stock values for the 76 depreciable assets, land, inventories, and intangible assets comprising the cost of capital model are used as weights.

[30] We calculate the share of inventories using FIFO accounting using inventory variables on IRS Form 1125 from the nonpublic IRS corporate study tax file. The share of inventories using FIFO accounting varies by industry. For 33 industries, the share is 95 percent or higher. But for petroleum and coal products (NAICS code 324) it is 65.5 percent; for retail trade (NAICS code 44), it is 73.2 percent. The average share of inventories using FIFO accounting across all 54 cost-of-capital model industries is 85.4 percent. See pp. 23-24 of Ozanne and Burnham (2006) for the equations used to calculate the real before-tax rate of return to inventories under LIFO accounting and FIFO accounting.

[31] In equations (3a) and (3b), γ is 1 minus the disallowance share.

[32] For α_{cetd} and α_{cent}, see the shares of marginal saving (in corporate equity) that are deferred or exempted in Table 1. To obtain α_{ceft}, subtract α_{cetd} and α_{cent} from 1. The after-tax rate of return on corporate equity (sce) is less than E_c, implying that the real discount rate for the corporate business is generally greater than the real discount rate for the pass-through business.

return on retained earnings after the capital gains tax is paid.[33] The after-tax rate of return on temporarily-deferred accounts is a function of the federal tax rate on distributions from annuities and retirement saving.[34] The after-tax rate of return on nontaxable accounts equals E_c.

The difference between ρ and an overall after-tax rate of return to marginal saving (s) gives the tax wedge. Dividing that tax wedge by ρ gives

(5) $$EMTR = (\rho - s)/\rho,$$

or an effective marginal tax rate that includes both firm-level taxes and individual-level taxes. For corporate businesses, s in equation (5) is a weighted average of the after-tax rate of return on corporate equity and the after-tax rate of return on corporate debt.[35] As with the after-tax rate of return on corporate equity, the after-tax rate of return on corporate debt is a weighted average of the marginal saver's returns to corporate debt holdings in fully taxable accounts (e.g., directly-held corporate bonds, savings accounts), temporarily-deferred accounts, and nontaxable accounts. The after-tax rate of return on corporate debt in fully taxable accounts includes the federal marginal tax rate on interest income; the after-tax rate of return on corporate debt in temporarily-deferred accounts includes the federal marginal tax rate on distributions.

For pass-through businesses, s is also a weighted average of the after-tax rate of return on corporate equity and the after-tax rate of return on corporate debt. However, the weights applied are specific to marginal saving in the pass-through business sector. In general, for both corporate businesses and pass-through businesses, s for equity falls below the real return on equity E_c.

2. Owner-occupied housing.

The real before-tax return on owner-occupied housing is

(6) $$\rho = r_h - t_p \gamma_h \tau_h$$

if only federal-level tax provisions and state and local property taxes are considered.[36] In equation (6), r_h is the real discount rate for owner-occupied housing, t_p the property tax rate, γ_h the share of subnational real estate taxes and home mortgage interest deducted by home owners, and τ_h the federal tax rate applying to a marginal investment in owner-occupied housing.

Equation (6) reflects several differences in the tax treatment of owner-occupied housing. For example, income from an investment in owner-occupied housing is not taxed $(\tau = 0)$, but no depreciation deductions are permitted for owner-occupied housing $(A = 0)$. Homeowners who itemize can deduct property taxes. The value of the real estate tax deduction is given by $t_p \gamma_h \tau_h$.

[33] The real return on retained earnings after the capital gains tax is paid reflects several factors—the deferral of tax on real and inflationary gains until the asset is sold, different marginal tax rates on short-term capital gains and long-term capital gains, and the exemption from tax of capital gains held until death. See pp. 19-21 of Ozanne and Burnham (2006).

[34] See Table 1 for federal individual-level tax rates used in calculating sce.

[35] See the fraction of corporate marginal investment financed with debt in Table 1 for the weights used.

[36] Equation (6) is given by $\rho = r_h + t_p(1 - \gamma_h \tau_h)$ if the effective marginal tax rate calculations include both federal-level tax provisions and state and local property taxes.

Home owners who itemize can also deduct home mortgage interest expenses. Modifying equations (3a) and (3b) gives

$$(7) \qquad r_h = f_h(i(1-\gamma_h\tau_h)-\pi)+(1-f_h)E_h,$$

where f_h is the fraction of marginal investment in owner-occupied housing financed with debt and $f_h i\gamma_h t_h$ is the value of the home mortgage interest deduction.[37] In the cost of capital model, γ_h is calculated as the share of home mortgage interest that is deducted. Between 2021 and 2025, changes to the HMI and SALT deductions are assumed to reduce the value of γ_h below what is calculated using 2016 data. After 2025, γ_h is assumed to return to its value calculated using 2016 data.[38]

3. Phase out of bonus depreciation.

Under the TCJA, 100-percent bonus depreciation is phased out at a rate of 20 percentage points per year beginning in 2023. The phase out of bonus depreciation might be expected to pull investment forward, with the incentive effect being represented by lower EMTRs for new investment in qualified property in 2022 when compared to EMTRs in 2023 and later. However, the intertemporal substitution of investment may be diminished by the costs of adjusting the level of the capital stock. If adjustment costs are large, temporary bonus depreciation may have a smaller impact on current levels of investment. The cost of capital model takes account of temporary tax incentives and other provisions of the TCJA that change incentive effects for nonresidential investment between 2021 and 2027.

Auerbach and Hassett (1992) show that with adjustment costs the optimal level of investment at time t is a function of the weighted average of current and expected future user costs of capital, or

$$(8) \qquad c_t = \sum_{s\geq t} w_{s-t}\, c_s,$$

where c_s is the user cost of capital at s and w_{s-t} denotes weights that sum to one and vary with the marginal cost of adjustment.[39] With low adjustment costs, the weights applied to initial user costs are high, implying that investment is less affected by future user costs. With high adjustment costs, the weights applied to the initial user costs are small, implying that investment

[37] E_h in equation (7) equals the after-tax rate of return on corporate equity.
[38] Using 2016 data, γ_h equals 0.8582. It is calculated as the ratio of mortgage interest deductions to mortgage interest payments. The value of mortgage interest deductions is taken from Table 2.1 of Statistics of Income (2016). Statistics of Income, 2016, *Individual Income Tax Returns Publication 1304 2016,* available at https://www.irs.gov/statistics/soi-tax-stats-individual-income-tax-returns-publication-1304-complete-report. The value of mortgage interest payments is taken from line 16 (monetary interest paid by households for owner-occupied housing) of the July 30, 2019 release of U.S. BEA, NIPA Table 7.11 (Interest Paid and Received by Sector and Legal Form of Organization), available at https://apps.bea.gov/histdata/fileStructDisplay.cfm?HMI=7&DY=2019&DQ=Q2&DV=Advance&dNRD=July-30-2019. Between 2021 and 2025, the value of γ_h is assumed to be more than halved.
[39] Alan Auerbach and Kevin Hassett, 1992, 'Tax Policy and Business Fixed Investment in the United States', *Journal of Public Economics*, Vol. 47 Issue 2, pp. 141-170, available at http://www.nber.org/papers/w3619 (National Bureau of Economic Research Working Paper No. 3619).

is more affected by future user costs. Auerbach and Hassett (1992) also use a 'comprehensive' measure of the user cost of capital given by

$$(9) \qquad c_s = ((1 - \Gamma_s)/(1 - \tau_s))\big(r + \delta + ((\Gamma_{s+1} - \Gamma_s)/(1 - \Gamma_s))\big),$$

where

$$(10) \qquad \Gamma_s = k_s + A_s(1 - k_s).$$

Equations (9) and (10) make the user cost of capital in period s a function of a one-period change in the present value of the tax benefit from depreciation allowances.

Cohen, Hansen, and Hassett (2002)[40] use the framework established in Auerbach and Hassett (1992) to estimate the user cost of capital under a temporary (3-year) bonus depreciation included in the Job Creation and Worker Assistance Act of 2002.[41] Using the bracketed part of equation (2), the user cost of capital would be the same in each of the three years over which bonus depreciation is in place. Using equations (9) and (10), Cohen, Hansen, and Hassett (2002) obtain a user cost of capital that is lower in the final year of the temporary bonus depreciation (the transition year) than it is in the first two years because of the anticipated reduction in the present value of the tax benefit of depreciation allowances when bonus depreciation expires.[42]

Cohen, Hansen, and Hassett (2002) base the weights w_{s-t} used in equation (8) on a term Ω from Auerbach and Hassett (1992).[43] For equipment, Auerbach and Hassett (1992) estimate an Ω of around 0.5. For structures, they indicate that a much higher Ω is appropriate, perhaps on the order of 0.95. Cohen, Hansen, and Hassett (2002) specify the relationship between Ω and w_{s-t} as follows:

$$(11a) \quad w_0 = 1 - \Omega,$$

$$(11b) \quad w_{s-t} = w_{s-t-1} \cdot \Omega, \; s > t,$$

where $\sum_{s \geq t} w_{s-t} = 1$. This means that with $\Omega = 0.5$ in Cohen, Hansen, and Hassett (2002) the weights used in equation (8) are consistent with each successive year's cost of capital being half as important as the previous one.

The EMTRs in Table 4 and Table 5 are obtained using weights comparable to those used in Cohen, Hansen, and Hassett (2002). For all modified accelerated cost recovery system (MACRS) equipment and for nonresidential structures with recovery periods of 5 or 7 years, an Ω of 0.5 is

[40] Darrel Cohen, Dorthe-Pernille Hansen, and Kevin Hassett, 2002, 'The Effects of Temporary Partial Expensing on Investment Incentives in the United States,' *National Tax Journal*, Vol. LV No. 3, pp. 457-466, available at http://www.aei.org/wp-content/uploads/2011/10/20030121_rahass0209.pdf.

[41] The Job Creation and Worker Assistance Act of 2002 allowed 30 percent of the basis of qualifying property to be deducted in the first year if the qualifying property was acquired over a 3-year period beginning September 11, 2001 and ending September 11, 2004.

[42] Equation (9) is equivalent to equation (1a) in Cohen, Hansen, and Hassett (2002) if the bracketed part of equation (1a) is put in real terms and the same rate of inflation is assumed for both output prices and new capital goods prices.

[43] Cohen, Hansen, and Hassett (2002) calculate weighted-average user costs of capital for assets with 3-year, 5-year, and 7-year lives under three alternative values for Ω (0.3, 0.5, and 0.7). An $\Omega = 0.3$ corresponds to a low adjustment-cost case. An $\Omega = 0.7$ corresponds to a high adjustment-cost case. An $\Omega = 0.5$ is the mid-point case.

used.[44] For all other structures, including electric and gas utility facilities which are depreciated using the 150-percent declining balance method with recovery periods of 15 or 20 years, an Ω of 0.95 is used.[45] For intangibles, an Ω of 0.5 is assumed. This is because $1/\delta$ for the 15 different types of R&D intangibles in the cost of capital model implies service lives between 2.8 years (computer systems design and related services R&D) and 10 years (pharmaceutical and medicine manufacturing R&D). The weighted-average service life for all 15 types of R&D intangibles is 6.7 years.[46]

The EMTRs in Table 4 and Table 5 are obtained by first calculating period-by-period values for the user cost of capital using equations (9) and (10) and then substituting values for c_s into equation (8). EMTRs using the weighted-average user cost of capital net of economic depreciation are obtained using equation (5). These EMTRs show the impact on incentive effects of not only the phase out of bonus depreciation but also the expiration of the 20-percent deduction of domestic, non-service pass-through business income in 2025, the replacement of expensing for R&E intangibles with amortization in 2022, and the switch in the limitation on interest deductions from an EBITDA definition of adjusted taxable income to an EBIT definition in 2022. The expiration of the 20-percent deduction of pass-through business income generally increases the present value of the tax benefit from depreciation allowances. The switch from EBITDA definition of adjusted taxable income to an EBIT definition increases the real discount rate on debt-financed investment, which slightly lowers the present value of depreciation for tax purposes and, hence, the present value of the tax benefit of depreciation allowances.

4. Model parameters.

Some cost of capital model parameters are constant across all industries, sectors, and asset types (see Table 1). Those parameters include federal tax rates such as the statutory federal corporate income tax rate. They also include the inflation rate, the nominal interest rate, and the real return on corporate equity.[47]

[44] In the cost of capital model, some NIPA structures (e.g., wind and solar property, facilities used in the exploration for and production of natural gas and petroleum) are assumed to be depreciated using the 200-percent declining balance method with recovery periods of 5 or 7 years.
[45] An Ω of 0.95 is also assumed for investments in land by corporate and pass-through businesses.
[46] No adjustment costs ($\Omega = 0$) are assumed for owner-occupied housing, owner-occupied housing land, and inventories. The fixed-asset, weighted-average Ω for all structures is 0.43. The fixed-asset, weighted average Ω for total business (corporate, pass-through) investment is 0.73, for corporate business is 0.67, and for pass-through business is 0.82. The fixed-asset, weighted average Ω for total (corporate business, pass-through business, owner-occupied housing) investment is 0.44.
[47] The cost of capital model uses 10-year, budget-period averages for the nominal (prime lending) interest rate and the annualized percent change in the gross domestic product (GDP) deflator. The real return on corporate equity is a long-term (1926-2016) historical average (real) return to corporate stocks. It is calculated using annual returns to the S&P 500 downloaded from http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html and historic CPI-U data (Historical Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, all items, index averages; percent change from previous December) downloaded from https://www.bls.gov/cpi/tables/supplemental-files/home.htm. It is calculated as a geometric average.

a. Sector and industry specific parameters.

Some parameters are constant across all asset types but may vary by sector or industry. For example, income earned by a marginal investment flows through to individuals as marginal saving and accrues in fully taxable accounts, temporarily tax deferred accounts, and nontaxable accounts (e.g., equation (4)). The share of this marginal saving that is temporarily tax deferred or tax exempted is calculated for investments in corporate equity and corporate debt, pass-through business debt, and homeowner debt using a methodology described in Ozanne and Burnham (2006).[48] The average holding period (in years) for inventories is calculated by industry as the ratio of inventories to final sales. Industry-specific data on private inventories are taken from National Income and Products Accounts (NIPA) Table 5.8.5B (Private Inventories and Domestic Final Sales by Industry) and NIPA Underlying Detail Table 1BUC (End-of-Period Current-Dollar Manufacturing and Trade Inventories).[49] Data on total final sales of goods and structures by domestic business are also obtained from NIPA Table 5.8.5B.[50] The longest average holding periods are among the agricultural (NAICS code 11, 2.513 years) and manufacturing industries (NAICS codes 31-33, 0.821 years).[51] The shortest is in finance and insurance (NAICS code 52, 0.009 years).

The share of after-tax profit retained by C-corporations also varies by industry. Overall (industry-wide) dividend-payout ratios are first calculated for 2006 through 2016 using data from NIPA Table 6.19D (Corporate Profits After-Tax by Industry) and NIPA Table 6.20D (Net Corporate Dividend Payments by Industry) that have been scaled using detailed nonpublic corporate tax data to account for pass-through businesses filing an IRS Form 1120 (S-corporations, RICs, and REITs).[52] To obtain industry-specific dividend-payout ratios, nonpublic corporate tax data on after-tax profits and distributions are used to reallocate across industries the scaled NIPA totals for after-tax profits and net corporate dividends.

Dividing the resulting industry-specific distributions by industry-specific after-tax profits gives dividend-payout ratios for the cost of capital model's 54 industries for 2006 through 2016. The

[48] See pp. 49-64 in Ozanne and Burnham (2006). Data for 2016 from the June 6, 2019 release of the Board of Governors of the Federal Reserve System, Financial Accounts of the United States, https://www.federalreserve.gov/releases/z1/release-dates.htm, are used.

[49] The September 26, 2019 release of U.S. BEA, NIPA Table 5.8.5B (Private Inventories and Domestic Final Sales by Industry), https://apps.bea.gov/histdata/fileStructDisplay.cfm?HMI=7&DY=2019&DQ=Q2&DV=Third&dNRD=September-27-2019, and the September 26, 2019 release of U.S. BEA, NIPA Underlying Detail Table 1BUC (End-of-Period Current-Dollar Manufacturing and Trade Inventories), https://apps.bea.gov/histdata/fileStructDisplay.cfm?HMI=7&DY=2019&DQ=Q2&DV=Third&dNRD=September-27-2019, are used. Tax data on inventories by NAICS sector from the nonpublic IRS corporate tax file are used to disaggregate the NIPA data where industry detail is insufficient.

[50] The April 19, 2019 release of BEA GDP-by-industry (value added by industry), https://www.bea.gov/industry/gdpbyind-data data are used to disaggregate total final sales data where industry detail is insufficient.

[51] The average holding periods are GDP-by-industry weighted averages.

[52] The July 30, 2019 releases of U.S. BEA, NIPA Table 6.19D (Corporate Profits After-Tax by Industry) and NIPA Table 6.20D (Net Corporate Dividend Payments by Industry), https://apps.bea.gov/histdata/fileStructDisplay.cfm?HMI=7&DY=2019&DQ=Q2&DV=Advance&dNRD=July-30-2019, are used.

dividend-payout ratios used for the cost of capital model are averages over 2006 to 2016.[53] One minus the dividend-payout ratio gives the share of after-tax profit retained by C-corporations. The overall average share of after-tax profit retained by C-corporations is 66.3 percent. The share of after-tax profit retained by C-corporations in several manufacturing sectors (e.g., NAICS code 325, 43.5 percent) falls below this overall average. The share of after-tax profits retained by C-corporations in some of the service sectors (e.g., NAICS code 514, 93.2 percent; NAICS code 42, 79.5 percent) is above the overall average.

Finally, the share of investment financed with debt varies by sector and industry. The share of investment by C-corporations and noncorporate businesses financed with debt is calculated as a ratio of total debt to the sum of total debt and equity. Industry-specific values for total debt and equity are calculated in two steps.

First, a Compustat file is used to obtain data on total debt and stockholders' equity in firms in the cost of capital model's 54 industries. The Compustat file is the result of a match between Compustat data and corporate tax data not available to the public. The Compustat variable for equity that is used includes capital surplus, common stock, nonredeemable preferred stock, redeemable preferred stock, retained earnings, and Treasury stock (which reduces stockholder equity). The Compustat data are assumed to include only C-corporations. Comparable data for the debt and equity of pass-through (noncorporate) businesses are approximated by multiplying the Compustat value for C-corporations by the ratio of a tax-data proxy for all corporations (C-corporations, S-corporations, RICs, and REITs) and a tax-data proxy for C-corporations.[54]

Second, 2016 data from the Financial Accounts of the United States are used to obtain target values for the total debt and equity of financial and nonfinancial C-corporations, noncorporate farm businesses, and nonfarm financial and nonfinancial noncorporate businesses.[55] The targets for financial C-corporations and financial noncorporate businesses (NAICS code 52) are further subdivided into NAICS code 522 (credit intermediation and related activities), NAICS code 523 (securities, commodity contracts, and investments), and NAICS code 525 (funds, trusts, and other financial vehicles) using unpublished corporate tax data.[56] Target values are assigned to an industry in the cost of capital model where appropriate; otherwise, they are distributed across

[53] An average is taken because for some NAICS sectors in some years NIPA corporate after-tax profits are positive but smaller than net corporate dividend payments. Calculated C-corporation dividend-payout ratios exceed one, implying that C-corporations retain a negative share of after-tax profits.

[54] The tax-data proxy for total debt is the interest-paid deduction. The tax data proxy for total equity is the sum of capital stock liabilities, additional paid-in capital, and retained earnings (appropriated and unappropriated) minus the cost of treasury stock. Data for these variables are obtained from the nonpublic corporate tax data.

[55] The June 6, 2019 release of the Board of Governors of the Federal Reserve System, Financial Accounts of the United States, https://www.federalreserve.gov/releases/z1/release-dates.htm, is used. See pp. 46-47 of Ozanne and Burnham (2006) for a listing of the Financial Accounts data used. Nonpublic corporate tax data are used to impute the share of Financial Accounts corporate debt and equity attributable C-corporations and the share attributable to S-corporations, RICs, and REITs. As with the Compustat data, the tax-data proxy for total debt is the interest-paid deduction. The tax-data proxy for total equity is the sum of capital stock liabilities, additional paid-in capital, and retained earnings (appropriated and unappropriated) minus the cost of treasury stock.

[56] Target values for financial noncorporate businesses are the share of Financial Accounts financial corporate debt and equity attributable to S-corporations, RICs, and REITs. Target values for NAICS code 522, NAICS code 523, and NAICS code 525 are obtained using unpublished tax data.

industries using data on C-corporation debt and equity and S-corporation, RIC, and REIT debt and equity from the first step. The shares of investment financed with debt are then calculated for each of the 54 industries in the cost-of-capital model.

In general, the share of investment financed with debt is higher for C-corporations. Among C-corporations, the capital-weighted average share of investment financed with debt is 32.3 percent. The share of investment financed with debt is lower for the nonfinancial sectors (26.5 percent) and substantially higher for the financial sectors (NAICS codes 522, 523, and 525, 96.8 percent).[57]

b. Cost recovery parameters.

The cost recovery parameters, including economic depreciation rates and tax depreciation methods, vary by asset type and industry (see Table 2).[58] Assets are depreciated using MACRS. Under MACRS, a combination of the tax recovery period and tax recovery method determines the depreciation schedule for an asset. The cost of capital model assigns one of nine different tax lives to each depreciable asset—3, 5, 7, 10, 15, or 20 years for equipment and some nonresidential structures; 25 years for water utility property; 27.5 years for residential rental property; and 39 years for nonresidential real property.[59] It also assigns one of three different tax recovery methods to each depreciable asset—straight line (SL), 150-percent declining balance with a switch to straight line (DBSL (150)), and 200-percent declining balance with a switch to straight line (DBSL (200)).

Table 2 shows that several types of nonresidential equipment are assumed to be depreciated over 7 years using the DBSL (200) method while several types of nonresidential structures are assumed to be depreciated over 39 years using the SL method. Economic depreciation rates by asset type are taken from Hulten and Wykoff (1981)[60] and U.S. Bureau of Economic Analysis (2003).[61] IRS (2019) largely guides the assignment of recovery periods and tax recovery method by asset type. In general, for most types of equipment and nonresidential structures, the present

[57] The share of investment financed with debt in lower (between 70 percent and 80 percent) for the financial businesses if RICs and REITs are included with C-corporations. For example, Ozanne and Burnham (2006) include RICs and REITs with C-corporations. Only S-corporations are treated as pass-through businesses. They report that financial C-corporations finance about 73 percent of investment with debt.

[58] In a few cases, the tax life and tax recovery method assigned to an asset can vary by industry. For example, under the TCJA, 7-year farm property can be depreciated over 5 years rather than 7 years. In addition, farm businesses are assumed to depreciate 5-year property using the 150-percent declining balance method with a switch to the straight-line method. Table 2 gives the tax lives and tax recovery methods that the cost of capital model assigns to depreciable assets owned by nonfarm businesses.

[59] In the cost of capital model, water utility property includes the nonresidential structures water supply and sewage waste and disposal in Table 2. Fifteen-year property includes otherwise depreciable land improvements that are not specifically included in IRS asset classes. Examples include roads, sidewalks, and bridges. Any real property trade or business that elects out of the limitation on interest deductions is required to use ADS for real property with a recovery period is 40 years for nonresidential buildings and 30 years for tenant-occupied residential buildings.

[60] Charles R. Hulten and Frank C. Wykoff, ,1981, 'The Measurement of Economic Depreciation', in Charles R. Hulten (ed), *Depreciation, Inflation, and the Taxation of Capital Income*', Washington, DC: The Urban Institute, pp. 81-125.

[61] U.S. Bureau of Economic Analysis, 2003, 'Fixed Assets and Consumer Durable Goods in the United States, 1925-1997', September, available at https://www.bea.gov/node/24441. For an update of BEA's depreciation estimates, 'BEA Depreciation Estimates' at https://apps.bea.gov/national/pdf/BEA_depreciation_rates.pdf.

value of depreciation for tax purposes exceeds the present value of economic depreciation because allowances under MACRS are deducted sooner than are economic depreciation allowances (see Table 3). However, for some types of equipment and nonresidential structures, the present value of economic depreciation exceeds the present value of depreciation for tax purposes, implying that allowances under MACRS are less generous.

Differences in the present value of depreciation for tax purposes contribute to variation in effective marginal tax rates across asset types and can potentially contribute to an inefficient allocation of capital. If depreciation for tax purposes matches economic depreciation, the effective marginal tax rates on depreciable assets do not vary by asset type, and the effective marginal tax rate on new equity-financed investment including only firm-level taxes (equation (1)) equals the statutory federal business income tax rate.

5. Limitations of the cost of capital model.

The U.S. cost of capital model omits some features of the federal tax code that may influence domestic incentives to save and invest. For example, the effective marginal tax rate calculations exclude federal estate and gift taxes. They generally ignore special credits, deductions, rates, and other tax provisions intended to encourage investment in specific assets or industries. They generally assume that firms use all available deductions and credits when such deductions and credits are likely to be of little use to a firm in a loss position or with a stock of unused tax losses and credit carry-forwards. However, they can include taxation of capital income at both the federal level and at the state and local levels, taking into account the effects of state and local income taxes, sales taxes, and property taxes on investment incentives.[62]

The cost of capital model also assumes that all savers and investors are subject to federal taxes. However, foreign savers do not pay federal individual-level taxes. This means that preferential capital gains tax rates and dividend income tax rates, lower federal corporate income tax rates, and other tax measures intended to reduce U.S. EMTRs on new investment may have less influence in an economy that is open to international capital flows.

Finally, the cost of capital model summarizes tax incentives for marginal (break-even) investments. The resulting EMTRs are considered to reflect the impact of taxes on the scale of investment in the United States. However, the TCJA makes substantial changes in the taxation of U.S. and foreign controlled multinational corporations. Some of these changes shift the United States from a world-wide tax system toward a participation exemption system. Other changes are intended to limit the erosion of the U.S. corporate income tax base by imposing a new minimum tax. Analysis with the cost of capital model does not include these international provisions that could impact the discrete choice about whether to locate an investment in the United States.

[62] State and local income taxes and sales taxes are not included in this analysis.

Table 1. Key U.S. cost of capital model parameters

	Current Law		No Sunset	
Market Rates of Return (in percent)				
Inflation Rate[a]	2.01		2.01	
Nominal Interest Rate[a]	5.32		5.32	
Real Return on Equity[b]	6.33		6.33	
Federal Tax Rates (in percent)	2021-25	2026-30	2021-25	2026-30
Statutory Federal Corporate Income Tax Rate	21.00	21.00	21.00	21.00
Individual-Level Tax Rates on:[c]				
Dividend Income	18.13	19.35	18.13	18.51
Long-term Capital Gains	20.03	20.86	20.03	20.32
Short-term Capital Gains	30.80	33.33	30.80	31.56
Interest Income	27.29	29.87	27.27	28.34
Home Mortgage Interest and Real Estate Tax Deductions[d]	(14.22)	(20.30)	(14.22)	(13.22)
Pass-through Business Income	25.61	30.88	25.57	26.24
Distributions of Nonqualified Annuities	17.59	20.83	17.58	18.04
Marginal Effective ITC Rate on Total R&D	6.89	6.89	6.89	6.89
	Vary by Sector			
Shares of Marginal Saving Deferred or Exempted[e]				
Corporate Equity				
Temporarily Tax Deferred (α_{cetd})	0.045		0.045	
Nontaxable (α_{cent})	0.322		0.322	
Corporate Debt				
Temporarily Tax Deferred (α_{cdtd})	0.173		0.173	
Nontaxable (α_{cdnt})	0.291		0.291	
Pass-through Business Debt				
Temporarily Tax Deferred (α_{ndtd})	0.113		0.113	
Nontaxable (α_{ndnt})	0.148		0.148	
Homeowner Debt				
Temporarily Tax Deferred (α_{hdtd})	0.029		0.029	
Nontaxable (α_{hdnt})	0.078		0.078	
	Vary by Industry (industry averages shown)			
Share of Investment Financed with Debt[f]				
C-corporations	0.3226		0.3226	
Pass-through Business	0.2285		0.2285	
Owner-occupied Housing	0.4241		0.4241	
Share of After-tax Profit Retained by C-corporations[g]	0.6629		0.6629	
Average Holding Period (in years) for Inventories[h]	0.3657		0.3657	

Source: US Department of the Treasury, Office of Tax Analysis

Notes: TCJA = Tax Cuts and Jobs Act; ITC = investment tax credit; R&D = research and development.

a. Table 1 shows 10-year, budget-period (2021-2030) averages for both the inflation rate and the nominal interest rate.
b. The long-term (1926-2016) historical average (real) return to corporate stocks is calculated using annual returns to the S&P 500 downloaded from http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html and historic CPI-U data (Historical Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, all items, index averages; percent change from previous December) downloaded from https://www.bls.gov/cpi/tables/supplemental-files/home.htm. It is calculated as a geometric average.
c. Table 1 shows average income-weighted federal marginal tax rates from a microsimulation model of individual tax. The 'current-law' individual-level federal tax rates assume that the TCJA's individual provisions sunset in 2025. The 'no-sunset' individual-level federal tax rates assume that the TCJA's individual provisions do not sunset in 2025.
d. A blend of income-weighted federal marginal income tax rates calculated for the home mortgage interest deduction and the real estate taxes paid deduction.
e. Calculated using data for 2016 from the June 6, 2019 release of the Board of Governors of the Federal Reserve System, Financial Accounts of the United States, https://www.federalreserve.gov/releases/z1/release-dates.htm. The shares of marginal saving exempted or deferred are calculated using the methodology described on pp. 49-64 of Ozanne and Burnham (2006).
f. The share of investment financed with debt in C-corporations and pass-through businesses is calculated using nonpublic tax data and data from the June 6, 2019 release of the Financial Accounts of the United States. See pp. 46-47 of Ozanne and Burnham (2006) for a listing of the Financial Accounts data used. The share of investment in owner-occupied housing financed with debt is the ratio of household sector home mortgage liabilities (Financial Accounts of the United States, June 6, 2019, release, Table L.218, line 2) and value of household owner-occupied housing (Financial Accounts of the United States, June 6, 2019, release, Table B.101, line 4).
g. The share of after-tax profits retained by C-corporations is obtained by subtracting a dividend-payout ratio from one. Dividend payout ratios are calculated using data from the July 30, 2019 releases of U.S. BEA, National Income and Product Accounts (NIPA) Table 6.19D (Corporate Profits After-Tax by Industry) and NIPA Table 6.20D (Net Corporate Dividend Payments by Industry), https://apps.bea.gov/histdata/fileStructDisplay.cfm?HMI=7&DY=2019&DQ=Q2&DV=Advance&dNRD=July-30-2019, and data from the nonpublic IRS corporate tax file.
h. Calculated using data from September 26, 2019 releases of U.S. BEA, NIPA Table 5.8.5B (Private Inventories and Domestic Final Sales by Industry), https://apps.bea.gov/histdata/fileStructDisplay.cfm?HMI=7&DY=2019&DQ=Q2&DV=Third&dNRD=September-27-2019, and U.S. BEA, NIPA Underlying Detail Table 1BUC (End-of-Period Current-Dollar Manufacturing and Trade Inventories), https://apps.bea.gov/histdata/fileStructDisplay.cfm?HMI=7&DY=2019&DQ=Q2&DV=Third&dNRD=September-27-2019.

Table 2. Cost recovery parameters

Asset	Economic Depreciation Rate (δ)	Tax Depreciation Method	
		Recovery Period (Years)	Tax Recovery Method
Nonresidential Equipment			
Mainframes	0.4532	5	DBSL (200)
Personal Computers	0.4009	5	DBSL (200)
Printers	0.3656	5	DBSL (200)
Terminals	0.2341	5	DBSL (200)
Storage Devices	0.3896	5	DBSL (200)
Prepackaged Software	0.5500	3	SL
Custom Software	0.3300	1	EXP
Own-account Software	0.3300	1	EXP
Communications Equipment	0.1112	7	DBSL (200)
Nonelectro Medical Instruments	0.1350	7	DBSL (200)
Electro Medical Instruments	0.1834	7	DBSL (200)
Nonmedical Instruments	0.1350	7	DBSL (200)
Photocopy and Related Equipment	0.1800	5	DBSL (200)
Office and Accounting Equipment	0.3119	5	DBSL (200)
Nuclear Fuel	0.2672	5	DBSL (200)
Other Fabricated Metal Products	0.0917	7	DBSL (200)
Steam Engines	0.0516	15	DBSL (150)
Internal Combustion Engines	0.2063	7	DBSL (200)
Metal-working Machinery	0.1183	7	DBSL (200)
Special Industrial Machinery	0.0856	7	DBSL (200)
General Industrial Equipment	0.1052	7	DBSL (200)
Electric Transmission and Distribution	0.0500	15	DBSL (150)
Light Trucks	0.1925	5	DBSL (200)
Other Trucks, Buses, and Trailers	0.1911	5	DBSL (200)
Autos	0.3333	5	DBSL (200)
Aircraft	0.0782	5	DBSL (200)
Ships and Boats	0.0611	10	DBSL (200)
Railroad Equipment	0.0589	7	DBSL (200)
Household Furniture	0.1375	5	DBSL (200)
Other Furniture	0.1179	7	DBSL (200)
Other Agricultural Machinery	0.1179	7	DBSL (200)
Farm Tractors	0.1452	7	DBSL (200)
Other Construction Machinery	0.1550	7	DBSL (200)
Construction Tractors	0.1633	7	DBSL (200)
Mining and Oilfield Machinery	0.1500	7	DBSL (200)
Service Industry Machinery	0.1502	7	DBSL (200)
Household Appliances	0.1650	5	DBSL (200)
Other Electrical Equipment	0.1834	7	DBSL (200)
Other Nonresidential Equipment	0.1473	7	DBSL (200)
Residential Equipment	0.1500	5	DBSL (200)

Table 2. Cost recovery parameters, cont'd.

Asset	Economic Depreciation Rate (δ)	Tax Depreciation Method	
		Recovery Period (Years)	Tax Recovery Method
Nonresidential Structures			
Offices	0.0247	39	SL
Hospitals	0.0188	39	SL
Special Care	0.0188	39	SL
Medical Buildings	0.0247	39	SL
Multimerchandise Shopping	0.0262	39	SL
Food and Beverage Establishments	0.0262	39	SL
Warehouses	0.0222	39	SL
Mobile Structures	0.0556	39	SL
Other Commercial	0.0262	39	SL
Manufacturing	0.0314	39	SL
Electric Power Structures	0.0211	20/15[a]	DBSL (150)
Gas Structures	0.0237	15	DBSL (150)
Petroleum Pipelines	0.0237	15	DBSL (150)
Wind and Solar	0.0303	5	DBSL (200)
Communication	0.0237	15	DBSL (150)
Petroleum and Natural Gas	0.0751	5	DBSL (200)
Mining	0.0450	7	DBSL (200)
Educational and Vocational	0.0188	39	SL
Lodging	0.0281	39	SL
Amusement and Recreation	0.0300	7	DBSL (200)
Air Transportation	0.0237	39	SL
Other Transportation	0.0237	39	SL
Other Railroad	0.0176	20	DBSL (150)
Track Replacement	0.0249	7	DBSL (200)
Local Transit Structures	0.0237	39	SL
Other Land Transportation	0.0237	5	DBSL (200)
Farm	0.0239	20	DBSL (150)
Water Supply	0.0225	25	SL
Sewage and Waste Disposal	0.0225	25	SL
Public Safety	0.0237	15	SL
Highway and Conservation	0.0225	15	DBSL (150)
Residential Structures			
Owner-occupied Buildings	0.0151	NA	NA
Tenant-occupied Buildings	0.0168	27.5	SL
Intangibles			
Research and Development	0.1732	5	SL[b]
Artistic Originals	0.1360	15	SL
Advertising[c]	0.6000	1	EXP

Source: US Department of the Treasury, Office of Tax Analysis

Notes: TCJA = Tax Cuts and Jobs Act; DBSL (200) = 200-percent declining balance with a switch to straight line; DBSL (150) = 150-percent declining balance with a switch to straight line; SL = straight line; EXP = expensing; NA = not applicable.

The cost recovery parameters shown apply from 2027. However, under the TCJA, farms and real property trade and business can elect out of the limitation on interest deductions. If they do, farms are required to use the Alternative Depreciation System (ADS) for property with a recovery period of 10 years or more and real property trade and business is required to use ADS for real property. The ADS recovery period for nonresidential buildings is 40 years while the ADS recovery period for tenant-occupied residential buildings is 30 years. The straight-line method is used with ADS recovery periods.

a. In Table B-2 of IRS (2019), electric utility nuclear production plants have a tax life of 15 years while other electric utility production plants have a tax life of 20 years. In the cost of capital model, the present value (PV) of depreciation for tax purposes for electric power structures is a weighted average of the PV of depreciation for tax purposes assuming a 15-year tax life and the PV of depreciation for tax purposes assuming a 20-year tax life. Weights are calculated using data on net generation by energy source in Table 3.1.A of U.S. Energy Information Agency (2019). U.S. Energy Information Agency, 2019, *Electric Power Annual 2018*, October, available at https://www.eia.gov/electricity/annual/.
b. For 2021, all research and development intangibles are assumed to be fully expensed with one exception. The cost of capital model assumes that domestic C-corporation exploration and drilling expenses are deducted with a 30 percent reduction in the allowable deduction. The 30-percent reduction is amortized over 5 years. Beginning in 2022, all research and development intangibles are amortized over a 5-year period. The present value of tax depreciation in Table 3 reflects the treatment of research and development intangibles from 2022.
c. The economic depreciation rate for advertising is taken from p. 23 of Corado, Hulten, and Sichel (2004). Carol Corado, Charles Hulten, and Daniel Sichel, 2004, 'Measuring Capital and Technology: An Expanded Framework', 2004-65 Finance and Economic Discussion Series, Division of Research and Statistics and Monetary Affairs, Federal Reserve Board, available at http://www.federalreserve.gov/pubs/feds/2004/200465/200465pap.pdf

Table 3. Present value (PV) of economic and tax depreciation (corporate)

Asset	PV Economic Depreciation (per Dollar)	PV Tax Depreciation (per Dollar)	100∗PV Tax Depreciation/PV Economic Depreciation
Nonresidential Equipment			
Mainframes	0.8991	0.8408	93.5
Personal Computers	0.8874	0.8289	93.4
Printers	0.8779	0.8283	94.4
Terminals	0.8216	0.8295	101.0
Storage Devices	0.8846	0.8337	94.2
Prepackaged Software	0.9154	0.8507	92.9
Custom Software	0.8665	1.0000	115.4
Own-account Software	0.8665	1.0000	115.4
Communications Equipment	0.6861	0.7930	115.6
Nonelectro Medical Instruments	0.7264	0.8129	111.9
Electro Medical Instruments	0.7829	0.8118	103.7
Nonmedical Instruments	0.7264	0.7915	109.0
Photocopy and Related Equipment	0.7797	0.8294	106.4
Office and Accounting Equipment	0.8598	0.8433	98.1
Nuclear Fuel	0.8401	0.8352	99.4
Other Fabricated Metal Products	0.6433	0.7893	122.7
Steam Engines	0.5037	0.6268	124.4
Internal Combustion Engines	0.8023	0.7923	98.8
Metal-working Machinery	0.6994	0.7899	112.9
Special Industrial Machinery	0.6274	0.8055	128.4
General Industrial Equipment	0.6742	0.7851	116.4
Electric Transmission and Distribution	0.4958	0.5661	114.2
Light Trucks	0.7910	0.8582	108.5
Other Trucks, Buses, and Trailers	0.7899	0.8337	105.5
Autos	0.8676	0.8665	99.9
Aircraft	0.6059	0.8121	134.0
Ships and Boats	0.5458	0.7358	134.8
Railroad Equipment	0.5367	0.8195	152.7
Household Furniture	0.7300	0.8376	114.7
Other Furniture	0.6987	0.7955	113.9
Other Agricultural Machinery	0.6987	0.7928	113.5
Farm Tractors	0.7406	0.7898	106.6
Other Construction Machinery	0.7530	0.8065	107.1
Construction Tractors	0.7625	0.8099	106.2
Mining and Oilfield Machinery	0.7468	0.7845	105.0
Service Industry Machinery	0.7471	0.7915	105.9
Household Appliances	0.7644	0.8380	109.6
Other Electrical Equipment	0.7829	0.8058	102.9
Other Nonresidential Equipment	0.7434	0.8039	108.1
Residential Equipment	**0.7468**	**0.8329**	**111.5**

Asset	PV Economic Depreciation (per Dollar)	PV Tax Depreciation (per Dollar)	100∗PV Tax Depreciation/PV Economic Depreciation
Nonresidential Structures			
Offices	0.3269	0.3665	112.1
Hospitals	0.2699	0.3654	135.4
Special Care	0.2699	0.3692	136.8
Medical Buildings	0.3269	0.3808	116.5
Multimerchandise Shopping	0.3400	0.3424	100.7
Food and Beverage Establishments	0.3400	0.3390	99.7
Warehouses	0.3039	0.3265	107.4
Mobile Structures	0.5223	0.3357	64.3
Other Commercial	0.3400	0.3359	98.8
Manufacturing	0.3818	0.3271	85.7
Electric Power Structures	0.2933	0.5672	193.4
Gas Structures	0.3179	0.6180	194.4
Petroleum Pipelines	0.3179	0.6197	194.9
Wind and Solar	0.3734	0.8295	222.2
Communication	0.3179	0.6178	194.3
Petroleum and Natural Gas	0.5963	0.8243	138.2
Mining	0.4695	0.7817	166.5
Educational and Vocational	0.2699	0.3249	120.4
Lodging	0.3559	0.3594	101.0
Amusement and Recreation	0.3711	0.7969	214.8
Air Transportation	0.3179	0.3310	104.1
Other Transportation	0.3179	0.5625	176.9
Other Railroad	0.2571	0.5413	210.5
Track Replacement	0.3287	0.7885	239.9
Local Transit Structures	0.3179	0.3029	95.3
Other Land Transportation	0.3179	0.8270	260.1
Farm	0.3197	0.4485	140.3
Water Supply	0.3067	0.4592	149.7
Sewage and Waste Disposal	0.3067	0.4612	150.4
Public Safety	0.3179	0.6043	190.1
Highway and Conservation	0.3067	0.6144	200.3
Residential Structures			
Tenant-occupied Buildings	0.2489	0.4353	174.9
Intangibles			
Research and Development[b]	0.7516	0.8102	107.8
Artistic Originals	0.7150	0.6010	84.1
Advertising[c]	0.9219	1.0000	108.5

Source: US Department of the Treasury, Office of Tax Analysis

See notes to Table 2. Table 3 generally shows the PV of economic depreciation and the PV of depreciation for tax purposes from 2027.

III. Effective marginal tax rate calculations under current law and no sunset

Table 4 shows EMTRs assuming current law. Under current law, TCJA's individual provisions sunset in 2025 and prior law is reinstated in January 2026. Table 5 shows EMTRs assuming that TCJA's individual provisions do not sunset at the end of calendar year 2025.

Assuming that the TCJA's individual provisions sunset, the effective marginal tax rate on new business investment is 25.2 percent from 2027.[63] The effective marginal tax rate on new corporate business investment is slightly lower at 24.3 percent because the cut in the federal corporate income tax rate is permanent. The effective marginal tax rate on new pass-through business investment is slightly higher at 26.5 percent because the 20-percent deduction of domestic, pass-through income of individuals expires at the end of 2025 but the limitation on interest deductions is permanent. Assuming that the TCJA's individual provisions are made permanent, the effective marginal tax rate on new pass-through business investment is 22.9 percent from 2027.

The effective marginal tax rate on total investment (corporate business, pass-through business, and owner-occupied housing combined) is lower if the TCJA's individual provisions are assumed to sunset. This is because the expiration of the TCJA's limits on the HMI and SALT deductions (and the expiration of its increase in the standard deduction) reduce the effective marginal tax rate on owner-occupied housing from 6.8 percent in 2025 to -3.1 percent in 2026. Assuming no sunset of TCJA's individual provisions, the effective marginal tax rate on owner-occupied housing increases from 6.8 percent in 2025 to 7.8 percent in 2026. As a result, the effective marginal tax rate on total investment is 16.8 percent in 2027 under current law but 18.3 percent assuming no sunset.

Between 2021 and 2026, the EMTRs are with one exception generally lowest in transition years because of anticipated reductions in the present value of the tax benefit of depreciation allowances. Transition years where this is the case include the final year of expensing for R&E intangibles (2021) and the final year of 100-percent bonus depreciation (2022). The one exception in the effective marginal tax rate calculations occurs with the sunset of the 20-percent deduction of domestic, pass-through income of individuals. In Table 4, the EMTRs for new pass-through business investment in equipment and intangibles are highest in 2025. This is because the sunset of the 20-percent deduction and, hence, the increase in the federal tax rate on pass-through business income imply an anticipated increase in the present value of the tax benefits of depreciation allowances and amortization (in the case of R&E intangibles) after 2025.

Differences in asset mix also explain differences between corporate and pass-through EMTRs by asset type. For example, in the cost of capital model, almost 53 percent of corporate investment in structures is in structures to which bonus depreciation applies. Just 12 percent of pass-through investment in structures is in structures to which bonus depreciation applies. As a result, under current law, the effective marginal tax rate on new investment in structures by corporate businesses increases 6.8 percentage points between 2022 and 2027 (from 17.4 percent in 2022 to 24.1 percent in 2027) while the effective marginal tax rate on new investment in structures by

[63] The EMTRs in Table 4 and Table 5 are consistent with no changes in tax law from 2027.

pass-through businesses increases 3.8 percentage points (from 21.1 percent in 2022 to 24.8 percent in 2027). The gap between corporate and pass-through EMTRs for new investment in structures is larger if the TCJA's individual provisions are assumed not to sunset. In Table 5, the effective marginal tax rate on new investment in structures by corporate businesses increases 6.1 percentage points between 2022 and 2027 (from 17.4 percent in 2022 to 23.5 percent in 2027) while the effective marginal tax rate on new investment in structures by pass-through businesses increases only 1.6 percentage point (from 19.9 percent in 2022 to 21.5 percent in 2027).

The TCJA also does not eliminate differences between corporate and pass-through EMTRs by asset type because the real discount rate for pass-through businesses is less than the real discount rate for corporate businesses. The real discount rate for pass-through businesses is smaller because the after-tax rate of return on equity (sce) is less than the required (pre-tax) real return on equity (E_c) (see equation (3a) and equation (3b)). It is also smaller because a higher federal pass-through business income tax rate and a smaller pass-through disallowance share increase the value of the interest deduction for pass-through businesses. A lower real discount rate for pass-through businesses implies a higher present value of depreciation for tax purposes, a lower user cost of capital net of economic depreciation, and generally a lower effective marginal tax rate. The difference in real discount rates is one reason why EMTRs on new investment in equipment are consistently lower for pass-through businesses in Table 5.

Table 4. Detailed EMTRs on new investment assuming the TCJA's individual provisions sunset under current law (in percent)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business	19.8	20.9	21.7	22.4	23.3	24.4	25.2	25.2	25.2	25.2
Corporate Business	17.2	18.7	19.4	20.2	21.1	23.1	24.3	24.3	24.3	24.3
Asset Type										
Equipment[a]	11.1	7.5	9.6	11.9	14.5	18.8	23.3	23.3	23.3	23.3
Structures[b]	19.3	17.4	17.9	18.5	19.3	21.6	24.1	24.1	24.1	24.1
Land[c]	27.4	27.4	27.4	27.4	27.4	28.3	28.3	28.3	28.3	28.3
Inventories[c,d]	30.7	30.9	30.9	30.9	30.9	31.6	31.6	31.6	31.6	31.6
Intangibles[e]	-47.5	8.7	8.7	8.7	8.7	9.8	9.8	9.8	9.8	9.8
Financing										
Debt-financed	3.4	6.7	7.7	8.9	10.3	15.2	17.1	17.1	17.1	17.1
Equity-financed	19.2	20.4	21.1	21.8	22.6	24.2	25.3	25.3	25.3	25.3
Pass-through Business	23.4	24.0	24.6	25.2	25.7	26.2	26.5	26.5	26.5	26.5
Asset Type										
Equipment[a]	12.1	12.6	18.5	24.2	28.1	14.3	20.0	20.0	20.0	20.0
Structures[b]	20.8	21.1	21.7	22.8	24.7	24.2	24.8	24.8	24.8	24.8
Land[c]	27.8	27.9	28.1	28.2	28.4	29.5	29.5	29.5	29.5	29.5
Inventories[c,d]	30.3	30.5	30.5	30.5	30.5	35.8	35.8	35.8	35.8	35.8
Intangibles[e]	-33.7	11.3	13.0	17.4	26.1	6.3	6.3	6.3	6.3	6.3
Owner-occupied Housing	6.8	6.8	6.8	6.8	6.8	-3.1	-3.1	-3.1	-3.1	-3.1
Total	14.1	15.1	15.5	15.9	16.1	15.6	16.8	16.8	16.8	16.8

Source: U.S. Department of the Treasury, Office of Tax Analysis

Notes: LIFO = last in first out; FIFO = first in first out; EMTRs = effective marginal tax rates; TCJA = Tax Cut and Jobs Act.

The effective marginal tax rates shown include firm-level taxes and individual-level taxes. They also include Section 179 expensing, the Research and Experimentation (R&E) credit, and bonus depreciation. The individual-level taxes used to calculate the EMTRs are budget-period (2021-30) averages obtained from OTA's Individual Tax Model. The inflation rate and the nominal interest rate used are also budget-period averages. They are taken from the Administration's fiscal-year 2021 baseline forecast.

a. Equipment includes both nonresidential and residential equipment.
b. Structures include nonresidential, tenant-occupied, and owner-occupied structures.
c. The economic depreciation rate is set to zero and no tax depreciation is included when calculating EMTRs.
d. For inventories, the effective marginal tax rate is calculated using a cost of capital that is a weighted average of the cost of capital under LIFO accounting and the cost of capital under FIFO accounting.
e. Intangible assets include research and development (R&D), artistic originals, and advertising. Advertising is assumed to be expensed. Artistic originals are assumed to be depreciated over 15 years using the straight-line method. R&D is assumed to be expensed in 2021 and amortized over 5 years beginning in 2022.
f. The EMTRs assume that most of TCJA's individual provisions sunset at the end of calendar year 2025 and that prior tax law is reinstated in January 2026. Other changes in tax law over the 10-year budget period are as follows: (i) The TCJA replaces expensing of R&E intangibles with amortization over 5 years beginning in 2022. (ii) The TCJA limits interest deductions to 30 percent of adjusted taxable income for corporate and noncorporate debt. In 2021, adjusted taxable income is calculated as earnings before interest, tax, depreciation, and amortization (EBITDA). From 2022, it is calculated as earnings before interest and tax (EBIT). (iii). One-hundred percent expensing of qualified property applies in 2021. Beginning in 2022, it phases out at a rate of 20 percentage points per year.

Table 5. Detailed EMTRs on new investment assuming the TCJA's individual provisions do not sunset (in percent)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business	19.0	20.0	20.5	21.1	21.7	22.6	23.4	23.4	23.4	23.4
Corporate Business	17.2	18.7	19.4	20.2	21.1	22.4	23.7	23.7	23.7	23.7
Asset Type										
Equipment[a]	11.1	7.5	9.6	11.9	14.5	18.1	22.6	22.6	22.6	22.6
Structures[b]	19.3	17.4	17.9	18.5	19.3	21.0	23.5	23.5	23.5	23.5
Land[c]	27.4	27.4	27.4	27.4	27.4	27.7	27.7	27.7	27.7	27.7
Inventories[c,d]	30.7	30.9	30.9	30.9	30.9	31.1	31.1	31.1	31.1	31.1
Intangibles[e]	-47.5	8.7	8.7	8.7	8.7	9.1	9.1	9.1	9.1	9.1
Financing										
Debt-financed	3.4	6.7	7.7	8.9	10.3	13.1	15.1	15.1	15.1	15.1
Equity-financed	19.2	20.4	21.1	21.8	22.6	23.8	24.9	24.9	24.9	24.9
Pass-through Business	21.2	21.5	21.7	22.0	22.2	22.7	22.9	22.9	22.9	22.9
Asset Type										
Equipment[a]	5.9	2.7	5.6	8.6	11.5	12.4	17.3	17.3	17.3	17.3
Structures[b]	20.0	19.9	20.1	20.3	20.7	21.0	21.5	21.5	21.5	21.5
Land[c]	25.2	25.3	25.3	25.3	25.3	25.7	25.7	25.7	25.7	25.7
Inventories[c,d]	30.3	30.5	30.5	30.5	30.5	31.3	31.3	31.3	31.3	31.3
Intangibles[e]	-51.9	3.4	3.6	4.3	5.9	2.8	2.8	2.8	2.8	2.8
Owner-occupied Housing	6.8	6.8	6.8	6.8	6.8	7.8	7.8	7.8	7.8	7.8
Total	13.9	14.8	15.2	15.6	16.1	17.2	18.3	18.3	18.3	18.3

Source: U.S. Department of the Treasury, Office of Tax Analysis

Notes: LIFO = last in first out; FIFO = first in first out; EMTRs = effective marginal tax rates; TCJA = Tax Cut and Jobs Act.

The EMTRs in Table 5 assume that most of TCJA's individual provisions do not sunset at the end of calendar year 2025. See notes to Table 4.