TAX POLICY CENTER
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TAX POLICY CENTER INTERNATIONAL INVESTMENT AND CAPITAL MODEL: CORPORATE INCOME TAX PROJECT TECHNICAL BRIEF

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ABSTRACT

This technical brief describes the Tax Policy Center's international investment and capital model (IICM) of cross-border tax rates. The Devereux-Griffith effective tax rate model underlying the IICM is explained in detail, and preliminary model outputs—effective marginal and average tax rates on US investment by country and industry—are presented and interpreted. Model applications and avenues for extension are also delineated.

In June 2020, the Urban-Brookings Tax Policy Center (TPC) extended its investment and capital model (ICM) to model cross-border investment and outlined a dissemination strategy. This brief documents the model extension in detail, including its motivation and planned research uses.

Foreign investment in the US is an important component of the economy and one that has been relatively underinvestigated in recent years. According the US Bureau of Economic Analysis (BEA), foreign-owned companies account for 16.3 percent of US private business capital investment, 15.2 percent of research and development, 7 percent of business value added, and 6 percent of private-sector employment.[1] According to data reported by the Internal Revenue Service's Statistics of Income Division, foreign-owned corporations also account for 14.6 percent of corporate income tax revenue. [2]

Incentives for cross-border investment depend on effective average (rather than marginal) tax rates. Previous TPC modeling produced estimates of only marginal rates, which determine the scope of investment but not market entry. The model extensions described in this brief allow TPC for the first time to calculate effective average tax rates for foreign and domestic businesses.[3] This change enables us, for example, to calculate the impact of the Tax Cuts and Jobs Act of 2017 (TCJA) on incentives for foreign investment in the US. TPC's estimates show that the TCJA greatly increased incentives for foreign (as well as domestic) investment in the US. These incentives increased more for countries with bilateral tax treaties (such as France and Germany) than it did for those without treaties.

In the near term, TPC will use the model to analyze the effect of TCJA on the level and composition of foreign investment in the US. To the best of TPC's knowledge, this would be the first formal empirical study of the impact of the TCJA on inbound cross-border investment. To ensure the highest-quality methodology and data, the forthcoming study using this model will be coauthored with international tax experts at the US Department of the Treasury's Office of Tax Analysis and the International Monetary Fund.

In future work, TPC will continue to expand and improve its business modeling capabilities, such as by estimating effective tax rates on inbound foreign investment in special tax regimes as well as on outbound US investment in foreign countries.

MARGINAL VERSUS AVERAGE EFFECTIVE TAX RATES

Investment decisions on market entry, such as the decision by a multinational enterprise on where to locate a particular investment project, respond to different tax incentives than decisions on the optimal size of an investment. Effective marginal tax rates (EMTRs) measure the effective tax rate on the return to an additional dollar of investment. Businesses facing a declining marginal productivity of capital expand investment until the last project undertaken just covers a normal return on capital, depreciation, and income tax liability. The EMTR thus measures the effect of business income taxes on the scope of investment, or "intensive margin."

By contrast, discrete investment choices over whether to invest in a particular jurisdiction respond to not only marginal but also average tax rates, or the share of total profits taken as income tax. Even a business income tax with an EMTR of zero, which does not burden the normal return to capital, may deter market entry if it takes a larger share of total profits than taxes in alternative jurisdictions. To gauge the effect of business income taxes on market entry, or the "extensive margin," a different measure than the EMTR is needed.

Market entry, including cross-border investment, depends not on EMTRs but on effective average tax rates (EATRs), or the present value of taxes as a share of corporate profits. The classic model of tax incentives for discrete investment decisions by Devereux and Griffith (1998, 2003) shows that the EATR constitutes a weighted average of the EMTR and the statutory corporate income tax rate (adjusted for investor-level taxes). The relevant weights depend on the profitability of the investment project in question: Marginal investments, which are highly sensitive to incentives such as depreciation allowances and interest deductibility, depend only on the EMTR. But as profitability increases, a larger share of returns are subject only to the statutory tax rate, whose weight therefore increases. In the extreme case of a project earning pure rent, or income without investment (as in the case of cross-border profit shifting), the EATR is the statutory rate itself.

The Devereux-Griffith model is the basis of TPC's international ICM (IICM) as described in the next section.[4] We initially calibrate the IICM to explore the incentives for foreign investment into the US. To this end, the model builds upon the detailed asset-by-industry US investment stock data from the BEA that underlies the ICM.[5] The BEA also publishes country-by-industry-by-finance method data on inbound foreign direct investment that will be used in conjunction with the EATRs measured by the model to investigate the impact of the TCJA on foreign investment in the US.

THE DEVEREUX-GRIFFITH MODEL

The Devereux-Griffith model builds upon the classic Hall and Jorgenson (1967) model that underlies the ICM. Both models are based on the standard financial model positing that in capital market equilibrium, the value of a firm equals the present discounted value of all future net dividend distributions:

$$V_t = \sum_{s=0}^{\infty} \frac{\alpha D_{t+s} - N_{t+s}}{(1+\beta)^s} \qquad (1)$$

where V_t is the value of the firm in period t, D_t is the value of dividends issued, and N_t is the value of new shares issues. Two parameters in equation (1) capture the effect of shareholder-level taxes on firm valuation: α is the ratio of after-tax dividend income to after-tax capital gains: $\frac{(1-\tau_{div})}{(1-\tau_{cg})}$, where τ_{div} is the investor-level dividend tax rate and τ_{cg} is the accrual-equivalent capital gains tax rate;[6] β is the investor-level discount rate, which equals $i\frac{(1-\tau_{int})}{(1-\tau_{cg})}$, where i is the nominal interest rate and τ_{int} is the investor-level tax on interest income. Given (1), the economic rent (R) from

an investment equals the change it induces in the firm's market value, which equals the present discounted value of all future changes in distributions:

$$R = dV_t = \sum_{s=0}^{\infty} \frac{\alpha dD_{t+s} - dN_{t+s}}{(1+\beta)^s} \qquad (2)$$

Dividends are related to investment by the firm's one-period financial budget constraint:

$$D_t = Q(K_{t-1})(1-\tau) - [I_t - \tau\phi(I_t + K_{t-1}^T)] + (B_t - B_{t-1}) - i(1-\tau)B_{t-1} + N_t \qquad (3)$$

where Q(K) is output, which depends on the previous-period capital stock; τ is the statutory coporate income tax (CIT) rate; I is investment; B is bond issuance; ϕ is the rate of tax depreciation; and K^T is the value of the capital stock net of cumulative tax depreciation allowances. Equation (3) shows that dividends equal the net difference of the firm's other investment and financing flows, which from left to right are: after-tax income from output (+), investment cost net of investment tax allowances (–), net bond issuance (+), after-tax interest expense (–), and new share issues (+).

To model a marginal investment, meaning one that just covers its cost of finance and depreciation after taxes, R is set equal to zero, and equation (2) can then be solved for the optimal capital stock.

To model an investment that yields profit in excess of the normal return, Devereux and Griffith (1998, 2003) consider a one-period perturbation of the capital stock that is reversed in the subsequent period.[7] The cost of both the investment good and output are normalized to unity. A one-unit increase in investment, $dI_t = 1$, entails a divestment in the following period of $dI_{t+1} = -(1 - \delta)*(1 + \pi)$, where δ is the economic depreciation (capital consumption) rate and π is the general rate of inflation. The resulting change in output in period t+1 is $dQ_{t+1} = p + \delta$, where p is the real financial return to the investment.

The rents generated by the investment depend upon the method of finance and can be decomposed into the return on an investment financed out of retained earnings plus the additional cost of external finance: $R = R_{re} + F$. In all cases, the return from the investment is assumed to be distributed as a dividend. For an investment financed with retained earnings, the post-tax economic rent is

$$R_{re} = \alpha\left\{-(1-A) + \left[\frac{(1+\pi)}{(1+\beta)}\right][(p+\delta)(1-\tau) + (1-\delta)(1-A)]\right\} \qquad (4)$$

where A is the presented discounted value of tax depreciation allowances multiplied by the corporate tax rate. The first term on the right-hand side of equation (4) captures the cost of the investment, which is reduced below unity by depreciation allowances. The second term captures the after-tax value of the investment's yield, and the third term captures the residual value of the capital stock. All terms are reduced by α because of taxation of the rent's distribution, and the second-period values are subject to inflation and discounting.

Where the investment is financed by borrowing or new share issuance, the additional costs are:

$$F = dB_t\alpha\left[1 - \frac{1+i(1-\tau)}{(1+\beta)}\right] + dN_t(\alpha - 1)\left(1 - \frac{1}{(1+\beta)}\right) \qquad (5)$$

The first term of the right-hand side of equation (5) reflects a unit of borrowing, which is repaid with tax-deductible interest in the next period. The second term reflects a unit of share issuance, which is paid back at par in the second period. With debt finance, the distribution of the resulting rent is fully taxed at the investor level and is therefore reduced by α, as it is for retained earnings. For new equity finance, the term $(\alpha - 1)$ reflects the dilution from the new share issuance, which has a value of unity; this reduces firm value (as well as financing cost) in the first period and is then reversed (with discounting) when the shares are repurchased in the second period, which for tax purposes is treated as a return of capital.

Setting R equal to zero, equations (4) and (5) can be used to solve for the marginal cost of capital, $\tilde{p}$:

$$\tilde{p} = \frac{(1-A)}{(1-\tau)(1+\pi)}(\beta + \delta(1+\pi) - \pi) - \delta - F\frac{(1+\beta)}{\alpha(1-\tau)(1+\pi)} \qquad (6)$$

Setting investor level taxes to zero (i.e., looking only at corporate-level taxes), the first two terms of equation (6) reduce to $\frac{(1-A)(r+\delta)}{(1-\tau)} - \delta$. This is the familiar King-Fullerton cost of capital, where r equals the real interest rate.[8] The third terms capture the effect of alternative means of financing. Since in the absence of taxes the firm's financing cost is the real interest rate, the corresponding tax-inclusive EMTR is $\frac{\tilde{p}-r}{\tilde{p}}$.

The EATR measures the tax wedge in the presence of post-tax economic rents and is therefore defined for $p \geq \tilde{p}$. To calculate the corresponding EATR requires a measure of rents in the absence of taxes:

$$R^* = -1 + \frac{1}{(1+i)}[(1+\pi)(p+\delta) + (1+\pi)(1-\delta)] \qquad (7)$$

One unit of investment yields a gross return in the following period of $p + \delta$, with a residual capital value of $1 - \delta$. Equation (7) reduces to $\frac{(p-r)}{(1+r)}$.

To construct the EATR, the difference between rents in the presence and absence of taxes, R* - R, is scaled by the net present value of the total profits stream, net of depreciation: $\frac{p}{(1+r)}$. Thus,

$$EATR = \frac{(R^* - R)}{\left[\frac{p}{(1+r)}\right]} \qquad (8)$$

Rewriting this in terms of the model parameters yields

$$EATR = \frac{\tilde{p}}{p}EMTR + \left(1 - \frac{\tilde{p}}{p}\right)T \qquad (9)$$

where $T = 1 - \frac{\alpha(1-\tau)(1+i)}{(1+\beta)}$ is the combined statutory tax rate on corporate income. (In the absence of investor-level taxes, T collapses to the statutory corporate income tax rate.) The effective average tax rate is thus a weighted average of the EMTR and the statutory CIT rate adjusted for investor-level capital income tax, where the weights depend on the level of corporate profitability. As profitability increases, the significance of marginal tax incentives such as investment allowances diminishes, and the EATR tends toward the statutory tax rate. In the extreme case of profit without investment—such as cross-border profit shifting—the tax share simply equals the statutory tax rate.

MODEL CALIBRATION

The general parameters of the IICM are set in line with average values drawn from the relevant literature. The nominal interest rate (i) is assumed to be 6 percent and inflation (π) is assumed to be 2 percent; the real interest rate (r) is accordingly 3.9 percent.[9] The MNE profit rate (p) is assumed to be 20 percent of the investment's original cost or book value.

Thus far, the IICM has been calibrated to reflect the standard tax regime for US investment introduced by the TCJA, which came into effect January 1, 2018, as well as the standard system that prevailed prior to that date. The standard CIT rate (τ) prior to 2018 was 35 percent, and the current rate is 21 percent.[10]

The US Internal Revenue Code (IRC) section 163(j) imposes earnings stripping rules limiting interest deductibility that affect the debt financing term in F. Prior to 2018, earnings stripping rules applied only to cross-border interest payments where the US payor had a debt-to-equity ratio exceeding 1.5 to 1 and its net interest expense exceeded 50 percent of adjusted taxable income plus net interest expense, net operating loss carryforwards, and depreciation, amortization and depletion. TCJA tightened these rules to apply to any interest expense, cross-border or domestic, that exceeded 30 percent of earnings before income taxes, interest expense and depreciation, amortization and depletion.[11] Beginning in 2022, this restriction will further tighten to 30 percent of earnings before income taxes and interest expense.

To account for these limitations on interest expense, IICM modifies the specification of F for debt financing (the first term on the right-hand side of equation 5) in the following manner:

$$F = dB_t\alpha\left[1 - \frac{1 + i(1 - \lambda_\tau)}{(1 + \beta)}\right] \qquad (10)$$

where λ is the fraction of interest that remains deductible after application of the 163(j) rules. The US Department of the Treasury's Office of Tax Analysis provided values for λ based on the share of total interest expense disallowed before and after 2018. For domestic corporations, the average value of λ for 2014 to 2017 is 1, and the 2018 value is 93 percent, while for foreign-owned corporations in the US, the corresponding ratios are 95 percent and 80 percent, respectively.

Finally, investor-level taxes for inbound foreign direct investment must be specified. Because share ownership of large, publicly owned companies is internationally diversified, this study does not attempt to incorporate individual shareholder-level dividend and interest tax rates. However, the model does incorporate taxes paid by the foreign parent company, including cross-border withholding taxes and income tax on interest inclusions, which vary according to the parent company's jurisdiction.

For dividend payments, the cross-border withholding tax depends on whether the parent company's jurisdiction exempts foreign earnings (a so-called "territorial" regime) or subjects them to domestic corporate income tax with a foreign tax credit (a so-called "worldwide" regime). In the former case, the cross-border withholding tax is limited to the US cross-border dividend withholding tax (WHT), as specified either by US

domestic law or by bilateral tax treaty, where applicable. In the latter case, the cross-border withholding tax is the cross-border dividend WHT plus any excess of the foreign jurisdiction's CIT rate over the combined US CIT and cross-border dividend tax rates. Most foreign countries currently exempt active foreign earnings.

Since interest payments are deductible by the payor (subject to 163(j)) but taxable to the parent, the parent-level interest tax rate is the greater of its domestic CIT rate and the applicable US cross-border WHT on interest. The US domestic law cross-border WHT rate for both interest and dividends is 30 percent, but this rate is often substantially lowered for countries with bilateral tax treaties.[12] Table 1 shows the applicable cross-border tax rates for jurisdictions detailed in the BEA inbound foreign direct investment data.

Cross-border WHT or parent-jurisdiction CIT rates are incorporate into the model's α and β parameters to calculate bilateral effective tax rates on inbound investment. The tax rate on capital gains, which applies to investment financed out of retained earnings, is presumed to be zero; therefore, α equals one minus the dividend WHT, and β equals one minus the greater of the interest WHT or the parent-company CIT rate, multiplied by the nominal interest rate.

TABLE 1

Cross-Border Withholding Tax and Corporate Income Tax Rates, 2018

Country	Dividend	Interest	CIT
Australia	5%	10%	30%
Austria	5%	0%	25%
Belgium	5%	0%	29%
Bermuda[a]	30%	30%	0%
Brazil[a]	30%	30%	34%
Canada	5%	0%	15%
China	10%	10%	25%
Curaçao[a]	30%	30%	22%
Denmark	5%	0%	22%
Finland	5%	0%	20%
France	5%	0%	34%
Germany	5%	0%	16%
Hong Kong[a]	30%	30%	17%
India	15%	15%	35%
Ireland	5%	0%	13%
Israel	13%	17%	23%
Italy	5%	10%	24%
Japan	5%	10%	23%
Kuwait[a]	30%	30%	15%
Lebanon[a]	30%	30%	15%
Luxembourg	5%	0%	19%
Malaysia[a]	30%	30%	24%
Mexico	5%	15%	30%
Netherlands	5%	0%	25%
New Zealand	5%	10%	28%
Norway	15%	0%	23%
Panama[a]	30%	30%	25%
Saudi Arabia[a]	30%	30%	20%
Singapore[a]	30%	30%	17%
South Africa	5%	0%	28%
South Korea	10%	12%	25%
Spain	10%	10%	25%
Sweden	5%	0%	22%
Switzerland	5%	0%	9%
Taiwan[a]	30%	30%	20%
United Arab Emirates[a]	30%	30%	0%
United Kingdom	5%	0%	19%
Venezuela	5%	10%	34%

Source: Tax Policy Center International Investment and Capital Model.

Notes:

[a]Country does not have bilateral tax treaty with the United States.

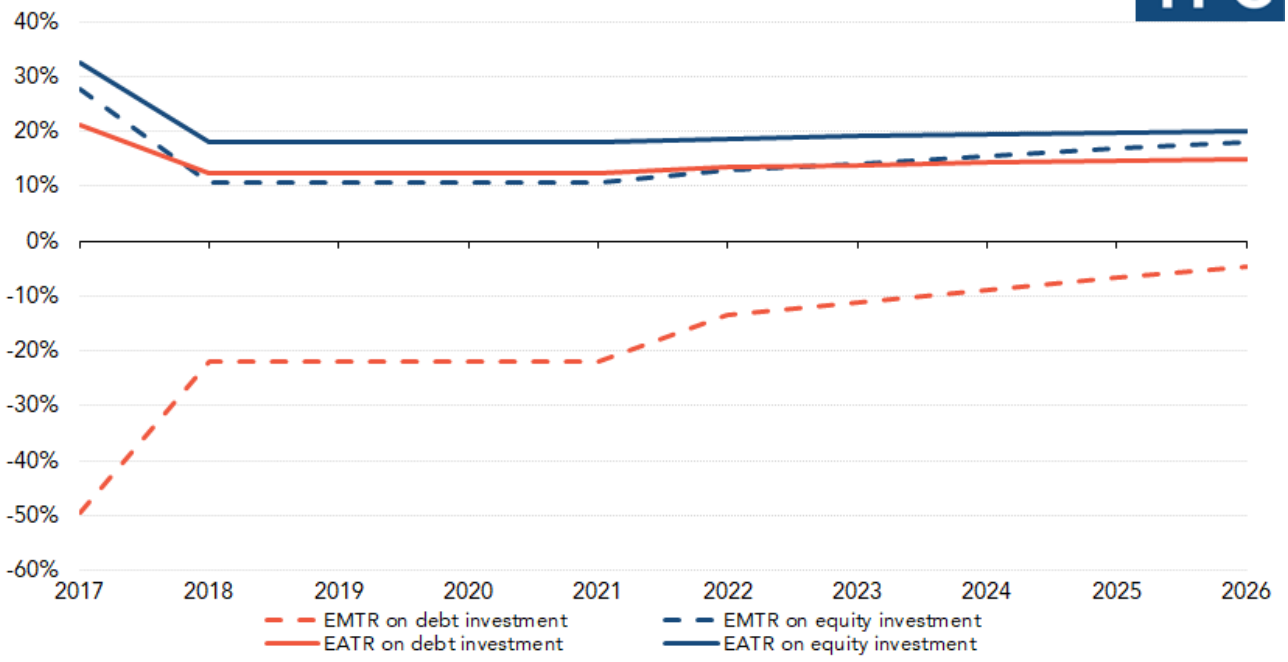
INTERNATIONAL INVESTMENT AND CAPITAL MODEL OUTPUTS

The TCJA has profoundly affected corporate-level effective tax ratesnot only because of its 14 percentage-point cut in the statutory rate but also because of its changes in the depreciation regime for equipment and intangibles. In addition to reducing the headline CIT rate from 35 percent to 21 percent, the TCJA increased bonus depreciation from 50 percent to 100 percent. However, bonus depreciation is scheduled to phase out completely at a rate of 20 percent a year between 2022 and 2026. And research and development expenditures, which have historically been expensed, will become subject to straight-line amortization over five years beginning in 2022. These factors, together with the abovementioned tightening of earnings stripping rules (which limit interest deductions), imply an increase in effective tax rates after 2021.

Before 2018, the 35 percent statutory CIT rate drove a sharp wedge between the EMTRs on debt and equity financed investment, because the value of interest deductibility increases with the CIT rate (figure 1). The 2018 rate reduction to 21 percent narrowed this difference by more than 40 percentage points as the EMTR on equity financed investment declined and the EMTR on debt financed investment rose.[13]

FIGURE 1

Corporate-Level Effective Tax Rates

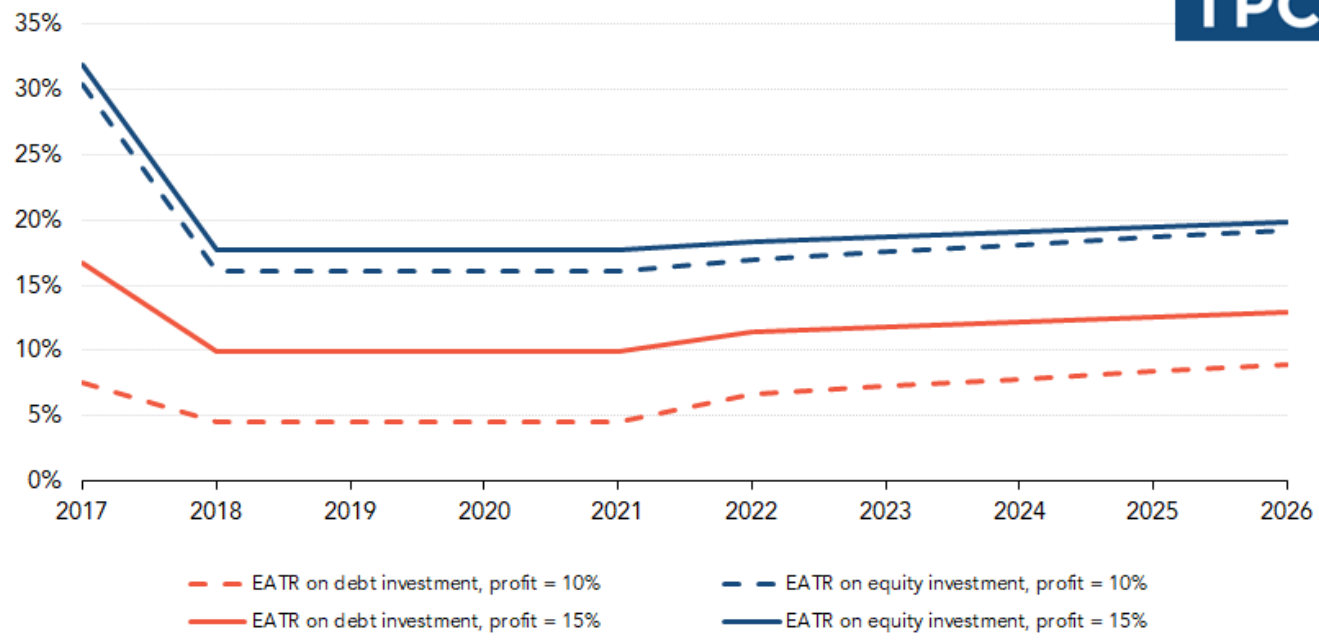


Source: Tax Policy Center International Investment and Capital Model.

By contrast, EATRs for debt and equity are far less divergent, because at a 20 percent profit rate, the majority of the corporate tax burden falls on rents for both methods of finance. Reducing the level of assumed rents to 15 or 10 percent creates a deeper divergence between EATRs on equity and debt (figure 2), but of course this does not affect EMTRs.

FIGURE 2

Effective Average Tax Rates for Varying Profit Levels

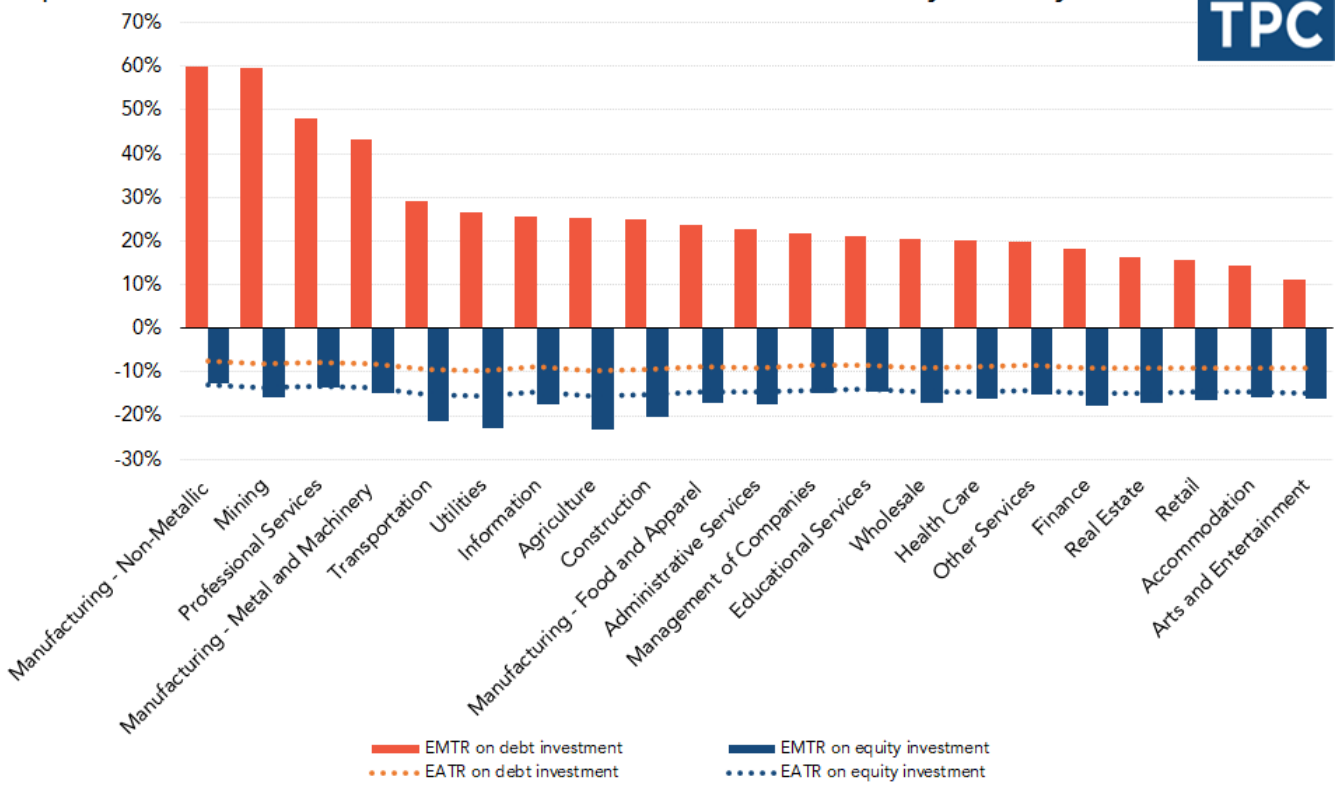


Source: Tax Policy Center International Investment and Capital Model.

Effective tax rates vary at the industry level because of differences in capital stock composition (figure 3).[14] Industries that invest heavily in intellectual property and structures (such as heavy manufacturing) and professional services, experienced a sharper increase in the effective tax rate on debt-financed investment. Unlike shorter-lived assets, intellectual property and structures did not benefit from an acceleration of depreciation under TCJA. By contrast, EATRs for both debt and equity-financed investments fell for all industries because of the effect of TCJA's rate cut on the assumed high level of profits.

FIGURE 3

Impact of the Tax Cuts and Jobs Act on Effective Tax Rates by Industry



Source: Tax Policy Center International Investment and Capital Model.

All countries experienced a reduction in their EATRs on US investment because of the TCJA (table 2).[15] The minimum decline in the equity EATR was 10.4 percent, and the minimum decline in the debt EATR was 6.4 percent. Countries that saw the largest decline in EATRs because of the TCJA were those with low dividend tax rates (because of bilateral tax treaties) and high interest tax rates because of their domestic CIT (because the maximum of the cross-border WHT and the domestic CIT was applied).[16] These countries include Venezuela, Australia, Mexico, New Zealand, and South Africa.

TABLE 2

Change in Cross-Border Effective Average Tax Rates, 2017-2018

Country	Change in Debt EATR	Change in Equity EATR	Country	Change in Debt EATR	Change in Equity EATR
Australia	-8.7%	-14.1%	Lebanon[a]	-6.4%	-10.4%
Austria	-8.6%	-14.0%	Luxembourg	-8.6%	-13.6%
Belgium	-8.7%	-12.8%	Malaysia[a]	-6.4%	-10.4%
Bermuda[a]	-6.4%	-10.4%	Mexico	-8.7%	-14.1%
Brazil[a]	-6.4%	-10.5%	Netherlands	-8.6%	-14.0%
Canada	-8.5%	-13.9%	New Zealand	-8.6%	-14.1%
China	-8.1%	-13.3%	Norway	-7.7%	-12.2%
Curaçao[a]	-6.4%	-10.4%	Panama[a]	-6.4%	-10.4%
Denmark	-8.6%	-14.0%	Saudi Arabia[a]	-6.4%	-10.4%
Finland	-8.5%	-14.0%	Singapore[a]	-6.4%	-10.4%
France	-8.9%	-10.9%	South Africa	-8.6%	-14.1%
Germany	-8.5%	-13.9%	South Korea	-8.1%	-14.3%
Hong Kong[a]	-6.4%	-10.4%	Spain	-8.1%	-13.3%
India	-7.8%	-12.8%	Sweden	-8.6%	-14.0%
Ireland	-8.5%	-13.8%	Switzerland	-8.4%	-13.8%
Israel	-7.9%	-12.6%	Taiwan[a]	-6.4%	-10.4%
Italy	-8.6%	-14.0%	United Arab Emirates[a]	-6.4%	-10.4%
Japan	-8.6%	-13.9%	United Kingdom	-8.5%	-13.9%
Kuwait[a]	-6.4%	-10.4%	Venezuela	-8.7%	-14.2%

Source: Tax Policy Center International Investment and Capital Model.
Notes:
[a]Country does not have a bilateral tax treaty with the United States.

Countries that saw the smallest decline in EATRs because of the TCJA were those without US bilateral tax treaties. These countries (Bermuda, Brazil, Curacao, Hong Kong, Kuwait, Lebanon, Malaysia, Panama, Saudi Arabia, Singapore, Taiwan, and the United Arab Emirates) have high cross-border withholding tax rates of 30 percent on both interest and dividends. Their EATR on debt-financed investment fell 6.4 percentage points in response to the TCJA, while their EATR on equity-financed investment fell 10.4 percentage points.

A small number of countries' EATRs were affected by changes to their domestic CIT rates between 2017 and 2018: France reduced its rate sharply from 44 percent to 34 percent, Belgium cut its rate from 33 percent to 29 percent, and South Korea increased its rate from 22 percent to 25 percent. As a result, France and Belgium's EATRs on debt-financed investment fell disproportionately relative to their EATRs on equity-financed investment; the reverse was true for South Korea.

FUTURE MODEL EXTENSIONS

The current IICM and related study focus on the standard corporate income tax regime for US inbound investment. Future extensions of the model will cover special inbound investment regimes, such as the base

erosion antiabuse tax (BEAT) and foreign derived intangible income (FDII) regime. Modelling the BEAT, an alternative minimum tax that disallows related-party payments such as royalties and service fees, will require modifying the cost of capital model, which reflects only depreciation and interest deductions.

The IICM will also be extended to cover the prevailing US tax regime on outbound investment, the global intangible low-income (GILTI) tax, as well as possible alternatives, such as President Biden's proposed foreign minimum tax. Extending the model to outbound investment will require collecting data on depreciation regimes in foreign host countries, to which end TPC will continue to partner with international organizations such as the International Monetary Fund.

By extending its business tax model to calculate EATRs as well as EMTRs, TPC broadens the scope of analysis that it can perform, looking not only at intensive but also extensive investment decisions. EATRs, which are broadly used by European scholars and policymakers to evaluate cross-border investment incentives, are less familiar in the United States. Hopefully, research enabled by TPC's IICM can help popularize the use of EATRs in US tax policy research.

TABLE A1

Effective Tax Rates by Industry

Industry	EMTRs				EATRs			
	Debt		Equity		Debt		Equity	
	2017	2018	2017	2018	2017	2018	2017	2018
All industries	-49.4%	-21.9%	27.8%	10.6%	21.2%	12.4%	32.6%	18.2%
Agriculture	-66.1%	-40.7%	24.1%	0.9%	20.1%	10.2%	31.5%	16.0%
Mining	-97.4%	-37.7%	18.2%	2.5%	18.6%	10.6%	30.0%	16.3%
Utilities	-67.0%	-40.4%	24.0%	1.1%	20.0%	10.3%	31.4%	16.1%
Construction	-55.4%	-30.4%	26.5%	6.2%	20.7%	11.3%	32.2%	17.1%
Manufacturing - Food and Apparel	-42.4%	-18.8%	29.5%	12.3%	21.7%	12.8%	33.1%	18.6%
Manufacturing - Non-Metallic	-88.3%	-28.6%	19.8%	7.1%	18.9%	11.6%	30.4%	17.3%
Manufacturing - Metal and Machinery	-68.7%	-25.3%	23.6%	8.8%	19.9%	11.9%	31.3%	17.7%
Wholesale	-36.4%	-15.9%	31.0%	13.9%	22.2%	13.2%	33.6%	19.0%
Retail	-24.7%	-9.0%	34.1%	17.8%	23.3%	14.3%	34.7%	20.0%
Transportation	-65.6%	-36.5%	24.2%	3.0%	20.1%	10.7%	31.5%	16.5%
Information	-47.0%	-21.6%	28.4%	10.8%	21.3%	12.4%	32.7%	18.2%
Finance	-34.6%	-16.3%	31.5%	13.7%	22.3%	13.1%	33.7%	18.9%
Real Estate	-28.1%	-11.9%	33.2%	16.2%	22.9%	13.8%	34.3%	19.6%
Professional Services	-72.8%	-24.7%	22.8%	9.2%	19.7%	12.0%	31.1%	17.8%
Management of Companies	-31.4%	-9.6%	32.3%	17.5%	22.6%	14.2%	34.0%	19.9%
Administrative Services	-42.4%	-19.6%	29.5%	11.9%	21.7%	12.7%	33.1%	18.5%
Educational Services	-28.8%	-7.6%	33.0%	18.6%	22.9%	14.5%	34.3%	20.3%
Health Care	-32.2%	-12.2%	32.1%	16.0%	22.5%	13.7%	33.9%	19.5%
Arts and Entertainment	-15.0%	-3.8%	36.9%	20.8%	24.3%	15.1%	35.8%	20.9%
Accommodation	-20.4%	-6.0%	35.4%	19.5%	23.7%	14.8%	35.1%	20.5%
Other services	-28.8%	-8.9%	33.0%	17.9%	22.9%	14.3%	34.3%	20.1%

Source: Tax Policy Center International Investment and Capital Model.
Note: Like Figures 1 and 2, this table shows only US corporate-level effective tax rates.

TABLE A2

Effective Average Tax Rates on Cross-Border Investment by Method of Finance

Country	2017			2018		
	Debt	Equity	Earnings	Debt	Equity	Earnings
Australia	24.3%	26.6%	25.4%	15.7%	12.5%	11.3%
Austria	24.2%	28.3%	27.0%	15.6%	14.3%	12.9%
Belgium	24.4%	25.6%	24.5%	15.7%	12.9%	11.6%
Bermuda	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
Brazil	37.9%	44.6%	37.7%	31.4%	34.2%	27.2%
Canada	24.1%	31.6%	30.1%	15.6%	17.7%	16.2%
China	26.9%	32.1%	29.5%	18.8%	18.9%	16.2%
Curaçao	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
Denmark	24.2%	29.3%	27.9%	15.6%	15.3%	13.9%
Finland	24.2%	29.9%	28.5%	15.6%	16.0%	14.6%
France	24.6%	21.9%	20.9%	15.7%	11.0%	9.8%
Germany	24.1%	31.3%	29.8%	15.6%	17.4%	15.9%
Hong Kong	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
India	29.8%	32.8%	29.4%	22.0%	20.0%	16.6%
Ireland	24.0%	32.4%	30.9%	15.6%	18.5%	17.0%
Israel	28.3%	34.4%	31.1%	20.4%	21.8%	18.5%
Italy	24.2%	28.6%	27.3%	15.6%	14.6%	13.3%
Japan	24.2%	28.8%	27.5%	15.6%	14.9%	13.5%
Kuwait	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
Lebanon	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
Luxembourg	24.2%	29.8%	28.4%	15.6%	16.2%	14.8%
Malaysia	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
Mexico	24.3%	26.6%	25.4%	15.7%	12.5%	11.3%
Netherlands	24.2%	28.3%	27.0%	15.6%	14.3%	12.9%
New Zealand	24.3%	27.3%	26.0%	15.7%	13.2%	12.0%
Norway	29.6%	36.3%	32.4%	21.9%	24.1%	20.1%
Panama	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
Saudi Arabia	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
Singapore	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
South Africa	24.3%	27.3%	26.0%	15.7%	13.2%	12.0%
South Korea	26.9%	33.1%	30.4%	18.8%	18.9%	16.2%
Spain	26.9%	32.1%	29.5%	18.8%	18.9%	16.2%
Sweden	24.2%	29.3%	27.9%	15.6%	15.3%	13.9%
Switzerland	24.0%	33.7%	32.1%	15.6%	19.9%	18.3%
Taiwan	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
United Arab Emirates	37.8%	45.9%	38.6%	31.4%	35.5%	28.2%
United Kingdom	24.1%	30.3%	28.8%	15.6%	16.3%	14.9%
Venezuela	24.4%	25.3%	24.2%	15.7%	11.1%	10.0%

Source: Tax Policy Center International Investment and Capital Model.

NOTES

[1] "Activities of U.S. Affiliates of Foreign Multinational Enterprises, 2018," news release 20-57, Bureau of Economic Analysis, November 13, 2020. https://www.bea.gov/news/2020/activities-us-affiliates-foreign-multinational-enterprises-2018

[2] "SOI Tax States – Foreign-Controlled Domestic Corporations," Internal Revenue Service, last reviewed Augus 12, 2020, https://www.irs.gov/statistics/soi-tax-stats-foreign-controlled-domestic-corporations

[3] Market entry is an issue for both multinational enterprises choosing whether to enter the US and domestic businesses choosing which state to locate in.

[4] Devereux and Griffith's EATR should not be confused with the corporate average tax rate. The latter, the empirical ratio of corporate income tax revenues to corporate profits, is a backward-looking measure of the average corporate income tax burden; by contrast, EATRs, which are based on statutory provisions, are forward-looking measures of investment incentives. Although average tax rates measure the average tax burden on past investment decisions, EATRs gauge the expected tax burden on new investment.

[5] "Fixed Assets," Bureau of Economic Analysis, accessed March 22, 2021,https://apps.bea.gov/iTable/index_FA.cfm

[6] An increase in the capital gains tax raises the relative value of dividend distributions by taxing the alternative distribution method (capital gains) more heavily. Because capital gains are taxed only upon realization, the accrual-equivalent capital gains tax rate is generally below the nominal investor-level tax rate on capital gains. If dividends and capital gains are subject to the same nominal tax rate (as is currently the case for long-term capital gains and qualifying dividends in the US), the value of α will be less than one.

[7] Klemm (2012) extends the Devereux-Griffith model to reflect a permanent investment.

[8] King and Fullerton (1984) define r as $i - \pi$, an approximation, while Devereux and Griffith define it more precisely as $(i - \pi)/(1 + \pi)$. For moderate rates of inflation, the two measures are very close. The IICM uses the Devereux-Griffith definition.

[9] $0.039 \approx (.06 - .02)/(1 + .02)$.

[10] The model is also being used to estimate the cross-border investment effects of Biden's corporate tax proposals.

[11] For details, see "Basic Questions and Answers about the Limitation on the Deduction for Business Interest Expense," Internal Revenue Service, last reviewed September 24, 2020,https://www.irs.gov/newsroom/basic-questions-and-answers-about-the-limitation-on-the-deduction-for-business-interest-expense.

[12] Countries in table 1 with tax treaties are thus those with dividend or interest WHTs below 30 percent.

[13] This is because the reduction in the value of the interest deduction, together with new limitations on that deduction, outweighed the reduction in the CIT.

[14] For details see table A.1.

[15] Although estimates of the EATR on investment financed with new shares and retained earnings differ, the amount by which the two EATRs change from 2017 to 2018 does not; therefore, the change in equity EATRs represents both finance methods.

[16] The interest tax rate has a negative influence on the EATR in part because of its positive effect on the present value of depreciation allowances, because it reduces the investor's discount rate.

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