



## Report Card on Effective Corporate Tax Rates: United States Gets an F

By Kevin A. Hassett and Aparna Mathur

*At 35 percent, the US statutory corporate tax rate is the highest among all the countries in the Organization for Economic Cooperation and Development (OECD). Since the 1980s, other OECD economies have been steadily lowering their tax rates, but the United States has not cut its top statutory rate since 1993. In the OECD, the United States also has higher-than-average effective average and effective marginal tax rates, which are the best indicators for capital investors of their true tax liability. Policymakers seeking to understand why some companies are moving plants abroad should consider the impact of tax rates on competitiveness. The Obama administration and the 112th Congress should lower effective tax rates so the United States can compete in the global economy.*

The White House and congressional Republicans are moving toward a consensus that the US corporate tax code needs a broad overhaul. President Barack Obama called on Congress to lower the corporate tax rate in his State of the Union speech on January 25,<sup>1</sup> and key congressional committees are addressing the issue. House Ways and Means Committee chairman Dave Camp (R-MI) held his first hearing in January on a corporate tax overhaul, and the Senate Finance Committee, led by Senator Max Baucus (D-MT), has also held hearings on broad-based tax changes. Treasury Secretary Timothy Geithner has hinted that the proposed changes may include lowering the top corporate tax rate, which currently stands at 35 percent. However, in an attempt to remain revenue neutral, the cut in the rate would be accompanied by base-broadening measures and the elimination of certain loopholes and deductions under the current system.

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While there is broad consensus that the high statutory corporate tax rate in the United States makes investments here uncompetitive relative to those in other OECD economies, some question the extent to which *effective* taxes paid by corporations are equally high. This *Outlook* examines relative tax rates in the United States and OECD

### Key points in this *Outlook*:

- Effective corporate tax rates are a better measure of competitiveness than statutory rates. Even by this measure, the United States does much worse than the other OECD countries.
- Corporate tax revenue in the United States is consistently lower than revenues in other OECD countries, despite higher US corporate tax rates.
- To bring investment and jobs back to the United States, policymakers should cut effective tax rates as part of an overhaul of the US corporate tax code.

### KEY DEFINITIONS

The **statutory corporate tax rate** is the headline rate imposed by law on corporate profits.

The **effective average tax rate** measures the average rate a firm might expect to face on an investment project over the possible distribution of profitability. The EATR informs location choices.

The **effective marginal tax rate** measures the tax liability incurred on an additional dollar of investment. The EMTR informs scaling choices, conditional on the location.

economies, with a special focus on effective average and effective marginal tax rates. Unfortunately, even by these indicators, the United States competes poorly in the global economy.

### Statutory Tax Rates

The statutory corporate tax rate is imposed by law on the earnings of capital in the corporate sector of the economy. Many countries, including the United States, apply statutory tax rates to taxable corporate income according to a schedule—that is, they tax different portions of taxable income at different rates. We have limited our comparisons to the top corporate tax rates in those schedules, as these apply to a majority share of corporate income. An international comparison of intermediate statutory corporate tax rates, for example, would add little information about investment incentives because most corporate investment is undertaken by corporations that face the highest statutory rates. In addition to national taxes, many subnational governments impose corporate income taxes. These are deductible from the central government rates in some countries.

The top national statutory corporate tax rates in 2010 among the thirty-one members of the OECD ranged from 8.5 percent in Switzerland to 35 percent in the United States (see table 1). Hence, within the OECD countries, the United States has the highest statutory tax rate at the national level. The picture changes only slightly when we add subnational corporate tax rates to the top national rate. In the United States, the average top statutory rate imposed by states in 2010 added just over 4 percent (after accounting for the fact that state taxes are deducted from federal taxable income) for a combined top statutory rate of 39.2 percent. Among all OECD countries in 2010, the

TABLE 1  
2010 TOP STATUTORY CORPORATE INCOME TAX RATES

Country	Central Government	Combined
Australia	30.0	30.00
Austria	25.0	25.00
Belgium	33.0	33.99
Canada	18.0	29.52
Chile	17.0	17.00
Czech Republic	19.0	19.00
Denmark	25.0	25.00
Finland	26.0	26.00
France	34.43	34.43
Germany	15.83	30.18
Greece	24.0	24.00
Hungary	19.0	19.00
Iceland	15.0	15.00
Ireland	12.5	12.50
Italy	27.5	27.50
Japan	30.0	39.54
Korea	22.0	24.20
Luxembourg	21.84	28.59
Mexico	30.0	30.00
Netherlands	25.5	25.50
New Zealand	30.0	30.00
Norway	28.0	28.00
Poland	19.0	19.00
Portugal	25.0	26.50
Slovak Republic	19.0	19.00
Spain	30.0	30.00
Sweden	26.3	26.30
Switzerland	8.5	21.17
Turkey	20.0	20.00
United Kingdom	28.0	28.00
United States	35.0	39.21

SOURCE: OECD Tax Database, "2010 Top Statutory Rate Table," table II.1, [www.oecd.org/dataoecd/26/56/33717459.xls](http://www.oecd.org/dataoecd/26/56/33717459.xls) (accessed February 8, 2011).

United States had the second-highest top statutory combined corporate tax rate, after Japan's rate of 39.5 percent. In 2011, the United States will have the highest national and combined corporate tax rates in the world when Japan introduces a planned 5-percentage-point reduction to its top rate.<sup>2</sup>

Top combined statutory rates among OECD countries, excluding the United States, have fallen from an average of about 48 percent in the early 1980s to 25.5 percent in 2010 (see figure 1). The main wave of reforms occurred in

the mid- to late-1980s but has continued in the 1990s and through the 2000s. In fact, the OECD average fell almost 9 percent from 2000 to 2010. The United States, however, has not reduced its top statutory rate since 1993.

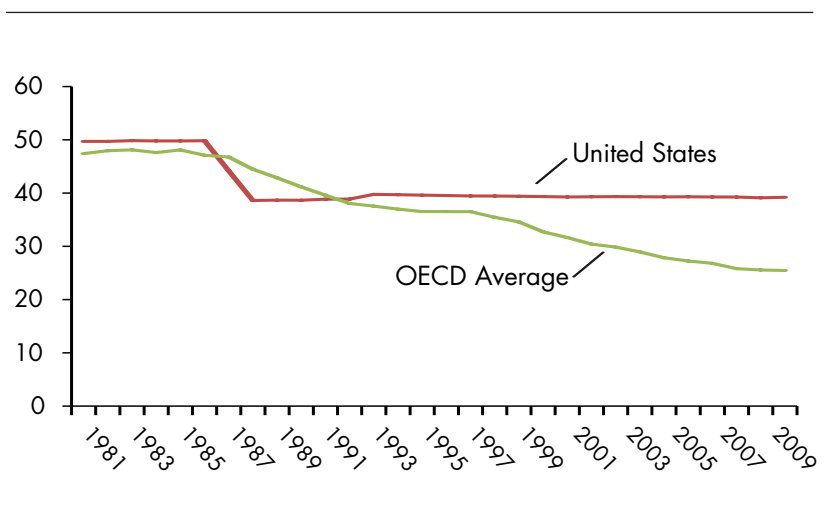
If we look at the frequency distribution of countries (using a kernel estimator) at different tax rates in 1981, 1996, and 2010, we see a striking change in the US position relative to other OECD countries (see figure 2). In 1981, the bulk of OECD countries had an average combined tax rate of slightly above 47 percent. The US rate was about 3 percentage points higher than that, at 50 percent. In 1996, the US tax rate was close to the average for OECD countries, at approximately 39 percent. However, in 2010, with no change in the top rate since the 1990s, the United States was among only four other OECD countries that had tax rates above 30 percent. Thus, the competitive gap between US and OECD corporate tax rates has opened up since the 1990s primarily because of widespread and substantial rate reductions abroad, rather than any significant corporate tax increase in the United States.

### Effective Tax Rates

The statutory tax rate is an imperfect measure of tax competitiveness because it does not take into account the breadth of the tax base.<sup>3</sup> This causes countries with high rates and a narrow base, such as the United States, to appear less competitive. “Effective” tax rates resolve this issue by taking into account tax offsets, the present value of depreciations, and other deductions that narrow the base.

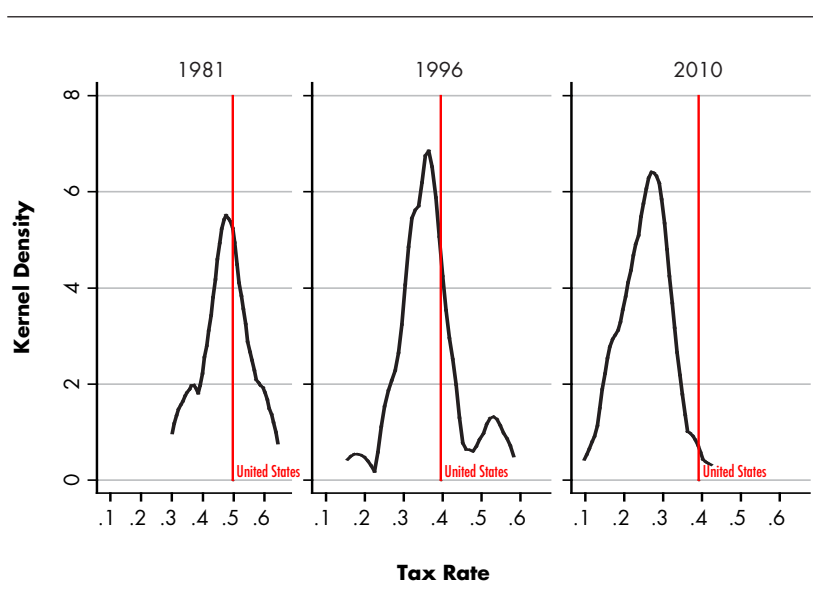
Effective tax rates can be measured using an approach outlined in a 1999 paper by economists Michael Devereux and Rachel Griffith. Extending a literature that dates back to the early 1960s, they propose that effective rates be explored using two main measures. The first is the effective marginal tax rate (EMTR), which applies to marginal investment projects in which the last unit invested provides just enough pretax return to cause the project to

FIGURE 1  
TOP STATUTORY CORPORATE TAX RATES, COMBINED



SOURCE: Authors' calculations based on the OECD Tax Database.

FIGURE 2  
DISTRIBUTION OF TOP STATUTORY CORPORATE TAX RATES IN THE OECD



SOURCE: Authors' calculations based on the OECD Tax Database.

break even after taxes. In other words, the marginal investment equates the net present value of the income stream to the net present value of the investment costs.

The EMTR would always be applicable under the assumption that “all potential investment projects that earn at least the cost of capital will be undertaken.”<sup>4</sup> However, in the real world there are many cases when an investor must make a choice between two projects that each earn more than the minimal return required to

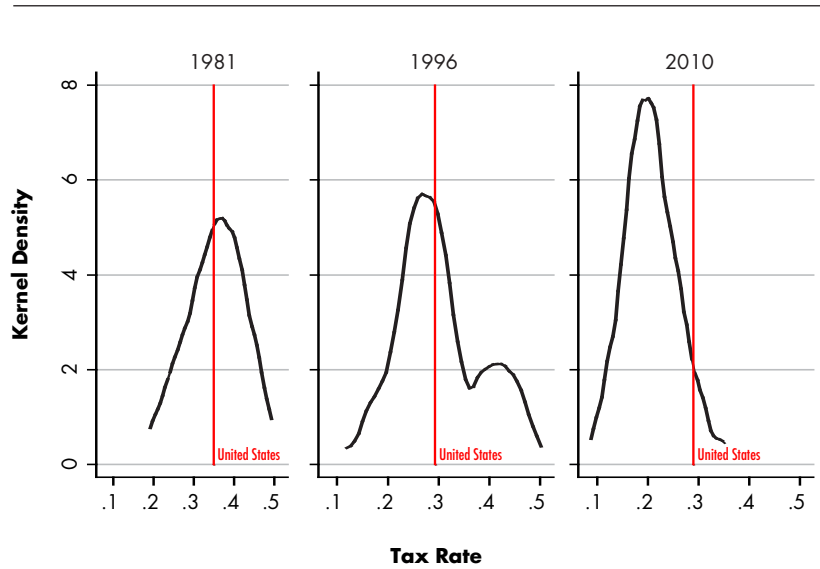
make the project worthwhile. The effective average tax rate (EATR) summarizes the distribution of tax rates for an investment project over the range of possible profitability levels. When deciding between mutually exclusive projects in which the net present value of the income streams is *greater* than the pretax net present value of the investment costs, the EATR will inform the decision.<sup>5</sup> That is, the EATR is likely the right rate to consider when exploring whether taxes are inducing companies to locate plants abroad. Conditional on that decision, the EMTR will inform the scaling of the project. If the concern is the observation that many profitable plants have been moved abroad, then the right effective rate to inspect is the EATR.

We computed the EATR and the EMTR for all countries in the sample and for each time period using the methodology outlined by Devereux and Griffith, assuming fixed parameter values for the economic depreciation rate, the inflation rate, and the annual discount rate. A detailed discussion of the methodology is in the appendix.

**Effective Average Tax Rates.** Our analysis finds that the United States' performance in the global economy does not look much better when scored with EATRs than when scored with the top statutory tax rates. The kernel densities show that the United States has moved far to the right of the mode of the OECD distribution. Or, more accurately, the OECD has moved to the left (see figure 3). In 1996, the United States' EATR was slightly below the OECD average, 29.2 versus 30.2. In later years, the OECD average improved by almost 10 percentage points to 20.6 while the United States' EATR remained relatively unchanged. In 2010, the US EATR was 29 percent. Table 2 shows our calculation of the EATRs for the OECD countries.

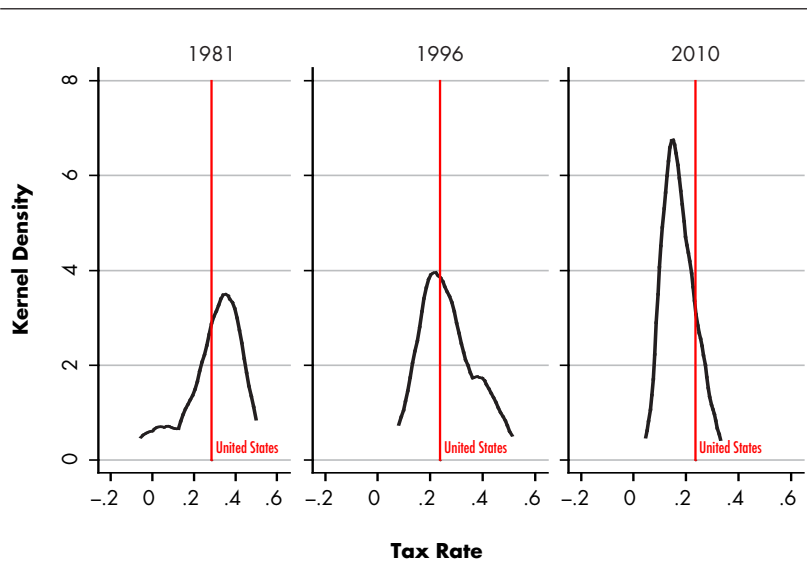
**Effective Marginal Tax Rates.** The United States compares slightly more favorably to other OECD countries on the EMTR. However, even its EMTR is significantly

FIGURE 3  
DISTRIBUTION OF EFFECTIVE AVERAGE CORPORATE  
TAX RATES IN THE OECD



SOURCE: AEI International Tax Database and authors' calculations.

FIGURE 4  
DISTRIBUTION OF EFFECTIVE MARGINAL CORPORATE  
TAX RATES IN THE OECD



SOURCE: AEI International Tax Database and authors' calculations.

higher than the OECD average. According to the distribution charts, in 1981 the United States was left of the mode; however, in the intervening years the rates in other countries declined, leaving the United States with one of the highest EMTRs (see figure 4). In 2010, the US EMTR was 23.6 percent, relative to the non-US OECD average

of 17.3 percent. All the rates are available in table 2.

A criticism of our methodology might be that we are unable to calculate effective tax rates for all countries using actual data on tax liabilities expressed as a fraction of profits. The lack of internationally comparable data for such an exercise is clearly a constraint. The World Bank approximates the effective rate using an alternative methodology.<sup>6</sup> This approach considers a representative company in a typical year of operation and computes the taxes it would pay if located in different countries as a percentage of its financial income using standardized financial accounting (a “book” measure of effective tax rates). Table 2 shows the effective rates computed by the World Bank using the book method. While the actual value of the rates computed varies under our methodology relative to the World Bank methodology, as we may expect, there is little improvement in the US position relative to other countries.

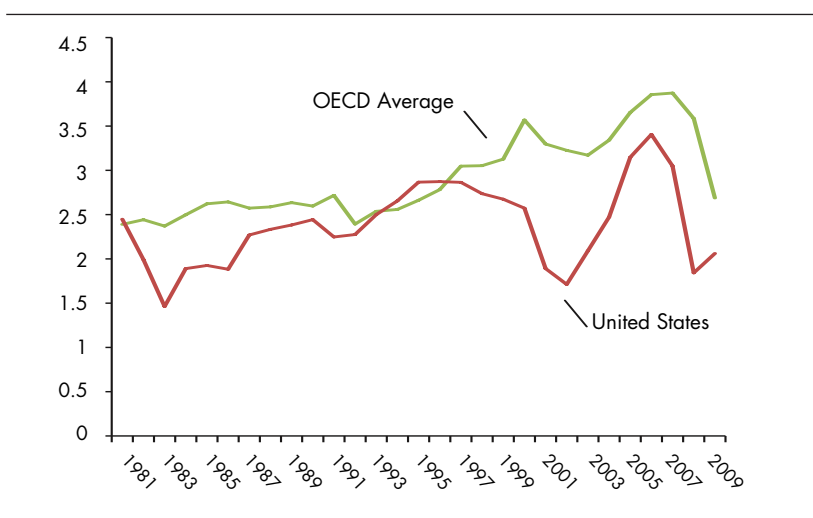
### Tax Revenues

Any discussion of tax rates is incomplete without an analysis of trends in corporate tax revenues. With the US corporate tax rates so high, one might expect the share of revenues from corporate capital to be higher in the United States than in other OECD economies. This is not the case, however. As figure 5 clearly shows, except for a brief period in the 1990s, US corporate tax revenues have been consistently lower than those of the OECD economies.

In 1981, the United States raised about 2.3 percent of GDP from corporate tax revenues, but between 2000 and 2004, it raised between 1.7 and 1.9 percent. The number in 2005 was slightly higher than in 1981, leading to the upward spike in figure 5. The figure also shows that for the United States, revenues dipped substantially below the OECD average in 1983 and 1987 and surpassed it in 1995.

For the average OECD country, corporate income tax revenues relative to GDP increased between 1981 and 2008 from about 2.4 percent to 3.9 percent, before declining precipitously in the aftermath of the Great Recession. For the United States, however, revenues

FIGURE 5  
CORPORATE INCOME TAX REVENUE AS A SHARE OF GDP



SOURCE: AEI International Tax Database and authors' calculations.

have shown a slight uptick in recent years, narrowing some of the revenue gap with the OECD economies. The glaring result from comparing the relative tax position of the United States to its relative revenue position is that despite (or perhaps because of) its relatively higher corporate tax rates, the United States earns less federal revenue from corporate income as a percentage of GDP than the average OECD economy.

This pattern is consistent with the literature that explores the responses of tax revenue to changes in the corporate tax rate. Alex Brill and Kevin A. Hassett found significant evidence that a reduction of the corporate tax rate in the United States would increase corporate tax revenue.<sup>7</sup>

### Discussion and Conclusion

The United States is currently underperforming in global tax comparisons. The United States' top statutory tax rates will soon be the highest in the OECD, and the US effective average and effective marginal tax rates are far above the OECD average. Any effort at corporate tax reform is therefore incomplete without a push toward addressing not only the high statutory rates, but also the relatively high effective average and marginal rates. These rates are the best indicators for capital investors of their true tax liability—much more so than the statutory rates. By our calculation, the US statutory rate is nearly 10 percentage points higher than the effective average rate and nearly

TABLE 2  
TAX RATES OF OECD COUNTRIES, 2009 AND 2010

	2010 EATR	2010 EMTR	2010 Statutory Combined	2009 EATR	2009 World Bank EATR Estimate
Australia	22.2%	17.0%	30.0%	22.2%	25.9%
Austria	20.8%	18.2%	25.0%	20.8%	15.7%
Belgium	22.3%	13.9%	34.0%	22.3%	4.8%
Canada	25.5%	23.4%	29.5%	27.1%	9.8%
Chile	13.9%	11.5%	17.0%	13.9%	—
Czech Republic	18.4%	18.1%	19.0%	19.4%	7.4%
Denmark	19.9%	16.5%	25.0%	19.9%	21.9%
Finland	20.7%	17.3%	26.0%	20.7%	15.9%
France	27.5%	23.8%	34.4%	27.5%	8.2%
Germany	24.2%	20.7%	30.2%	24.2%	22.9%
Greece	17.9%	13.4%	24.0%	18.6%	13.9%
Hungary	15.7%	13.4%	19.0%	16.6%	16.7%
Iceland	—	—	15.0%	—	6.9%
Ireland	10.9%	9.7%	12.5%	10.9%	11.9%
Italy	24.3%	22.6%	27.5%	24.3%	22.8%
Japan	33.0%	30.5%	39.5%	33.0%	27.9%
Korea	18.1%	13.6%	24.2%	18.1%	15.3%
Luxembourg	20.1%	13.9%	28.6%	20.1%	4.1%
Mexico	28.4%	27.7%	30.0%	26.5%	—
Netherlands	19.4%	15.1%	25.5%	19.4%	20.9%
New Zealand	—	—	30.0%	—	30.4%
Norway	24.2%	22.1%	28.0%	24.2%	24.4%
Poland	16.2%	14.1%	19.0%	16.2%	17.7%
Portugal	18.3%	12.2%	26.5%	18.3%	14.9%
Slovak Republic	19.2%	19.3%	19.0%	19.2%	7.0%
Spain	27.5%	26.3%	30.0%	27.5%	20.9%
Sweden	18.5%	12.6%	26.3%	18.5%	16.4%
Switzerland	15.4%	10.9%	21.2%	15.4%	8.9%
Turkey	13.1%	7.3%	20.0%	13.1%	8.9%
United Kingdom	22.3%	18.8%	28.0%	22.3%	23.2%
United States	29.0%	23.6%	39.2%	28.9%	27.6%
Average Excluding United States	20.5%	17.2%	25.5%	20.6%	15.9%

SOURCES: AEI International Tax Database and authors' calculations; OECD Tax Database; and World Bank, *Doing Business 2011: Making a Difference for Entrepreneurs* (Washington, DC, November 4, 2010), [www.doingbusiness.org/reports/doing-business/doing-business-2011](http://www.doingbusiness.org/reports/doing-business/doing-business-2011) (accessed February 2, 2011).

NOTE: For two countries in our sample, Iceland and New Zealand, we did not have enough information on depreciation allowances to be able to compute the effective rates.

17 percentage points higher than the effective marginal tax rate. Relative to other OECD countries, the United States is one of the worst performers on this score. The effective average tax rate for all OECD countries excluding the United States is 20.6 percent, while the effective marginal tax rate is 17.3 percent. The

corresponding values for the United States are 29 percent and 23.6 percent. Therefore, while much media attention has been focused on the statutory rates, policymakers should address the urgent need to reform effective rates as well.

*Matthew Jensen provided excellent research assistance for this Outlook.*

## Notes

1. White House, "Remarks by the President in the State of the Union Address," news release, January 25, 2011, [www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address](http://www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address) (accessed February 2, 2011).

2. Kosaku Narioka, "Japan Economy Minister Expects 5% Corp Tax Cut to Help Growth," Dow Jones, December 22, 2010.

3. See Jane G. Gravelle and Thomas L. Hungerford, "Corporate Tax Reform: Should We Really Believe the Research?" *Tax Notes* (October 27, 2008): 419; and Aviva Aron-Dine, "Fiscally Responsible Corp. Tax Reform Could Benefit the Economy," *Tax Notes* (August 18, 2008): 691.

4. *Ibid.*

5. Many examples of mutually exclusive projects arise when each project depends on economies of scale. Fixed costs involved in undertaking both projects can make it more profitable to undertake only one.

6. According to the World Bank *Doing Business 2011* report, the US book effective tax rate in 2009 was quite high by global standards, ranking 162nd out of 183 countries (89th percentile), and was also high compared to OECD member countries, ranking 3rd highest out of 30 (90th percentile). The book effective rate places the United States a little better than the statutory rate does, but not much.

Another way to calculate effective rates is to divide the actual amount of corporate income tax paid by the pretax profit. See World Bank, *Doing Business 2011: Making a Difference for Entrepreneurs* (Wash-

ington, DC, November 4, 2010), [www.doingbusiness.org/reports/doing-business/doing-business-2011](http://www.doingbusiness.org/reports/doing-business/doing-business-2011) (accessed February 2, 2011).

7. Kevin A. Hassett and Alex Brill, "Revenue-Maximizing Corporate Income Taxes: The Laffer Curve in OECD Countries" (AEI Working Paper 137, Washington, DC, July 31, 2007), [www.aei.org/paper/26577](http://www.aei.org/paper/26577).

## Appendix

### Data

The main sources of information for the data compiled in the AEI International Tax Database are: (1) Price-waterhouseCoopers, “Corporate Taxes—Worldwide Summaries” and “Individual Taxes—Worldwide Summaries”; (2) Coopers and Lybrand, “International Tax Summaries”; (3) Ernst and Young, “Worldwide Corporate Tax Guide 2001”; (4) International Bureau for Fiscal Documentation, Loose-Leaf Services; and (5) embassies and ministries of taxation in individual countries. Historical information was gathered from Georgetown Law Library and the Library of Congress. The revenue data have been obtained from the OECD.

### Methodology

The effective average tax rate (EATR) can be computed as the difference between the pretax and posttax economic rent scaled by the net present value of the pretax income stream  $Y_i^*$  associated with investment strategy  $i$ . Conceptually, the EATR can be expressed as follows,

$$\zeta_i = \frac{(R_i^* - R_i)}{Y_i^*}$$

where  $R_i^* = Y_i^* - F_i$  is the pretax economic rent and  $F_i$  equals the fixed cost.  $R_i = (1 - \tau_i)Y_i^* - (1 - A_i)F_i$  is the posttax economic rent calculated as the net present value of the income stream posttax minus the net cost of the investment.  $A_i$  is the net present value of tax allowances per unit of investment and  $\tau_i$  is the combined statutory tax rate.

We find  $\tau$ , the combined national and subnational top statutory tax rate, in the OECD tax database. It accounts for the national deductibility of subnational tax payments where applicable.

We calculate  $A$ , the net present value of allowances per unit of investment divided by  $\tau$ , using depreciation allowance data from the AEI International Tax Database. In particular, the database provides a measure for  $\Phi$ , the rate at which capital expenditure can be offset against tax. We also take assumptions for the real annual discount rate,  $r = 10\%$ , and the expected annual inflation rate,  $\pi = 3.5\%$ , from Michael Devereux, Rachel Griffith, and Alexander Klemm, “Corporate Income Tax Reforms and

International Tax Competition,” *Economic Policy* 17, no. 35 (October 2002): 451–95.

Assuming away interest taxation at the shareholder level, we calculate the shareholder’s nominal discount rate,  $\rho = (1 + r)^*(1 + \pi) - 1 = 13.85\%$ . Using these inputs, we calculate  $A$  for several cases based on requirements that vary by country:

Straight line depreciation is required and there is one off-set rate for all years.

$$A = (\Phi^*(1 + \rho)/\rho)^*(1 - (1/((1 + \rho)^{(1/\Phi)})))$$

Declining balance depreciation is required and there is one offset rate for all years.

$$A = \Phi^*(1 + \rho)/(\rho + \Phi)$$

Straight line depreciation is required and there is a different offset rate for subsequent years.

$$A = \Phi_1 + (\Phi_2^*(1 + \rho)/\rho)^*(1 - (1/((1 + \rho)^{(((1 - \Phi_1)/\Phi_2) + 1)}))) - \Phi_2$$

Declining balance depreciation is required and there is a different offset rate for subsequent years.

$$A = \Phi_1 + (\Phi_2^*(1 - \Phi_1)^*(1 + \rho)/((1 + \rho)^*(\rho + \Phi_2)))$$

Straight line depreciation or declining balance depreciation may be chosen, but the method must be consistent for all years. There is one rate for all years.

$$A_1 = (\Phi^*(1 + \rho)/\rho)^*(1 - (1/((1 + \rho)^{(1/\Phi)})))$$

$$A_2 = \Phi^*(1 + \rho)/(\rho + \Phi)$$

$$A = \max(A_1, A_2)$$

Straight line depreciation or declining balance depreciation may be chosen, but the method must be consistent for all years. There is a different offset rate for subsequent years.

$$A_1 = \Phi_1 + (\Phi_2^*(1 + \rho)/\rho)^*(1 - (1/((1 + \rho)^{(((1 - \Phi_1)/\Phi_2) + 1)}))) - \Phi_2$$

$$A_2 = \Phi_1 + (\Phi_2^*(1 - \Phi_1)^*(1 + \rho)/((1 + \rho)^*(\rho + \Phi_2)))$$

$$A = \max(A_1, A_2)$$

Instances where straight line depreciation or declining balance depreciation may be chosen and the method need not be consistent for all years are calculated ad hoc. Additionally, depreciation data were not available after 2007, so  $A$  values for 2008–2010 are set equal to values in 2007.

Allowances change very infrequently, so this assumption is unlikely to bias the results.

Taking the further assumption that the economic depreciation rate is  $\delta = 12.25\%$  from Devereux, Griffith, and Klemm, we can calculate the effective marginal tax rate.

$$EMTR = ((\delta + r) * (\tau - \tau * A)) / ((\delta + r) * (1 - \tau * A) - (\delta * (1 - \tau)))$$

Before deriving the effective average tax rate, we must calculate the net present value of the economic rent generated,  $R_t$ , and the net present value of the pretax economic rent  $R_t^*$ . We assume that the financial return,  $p$ , is 20%.

$$R_t = - (1 - (A * \tau)) + (1 / (1 + \rho)) * ((1 + \pi) * (p + \delta) * (1 - \tau) + (1 + \pi) * (1 - \delta) * (1 - (A * \tau)))$$

$$R_t^* = (p - r) / (1 + r)$$

Then we obtain the EATR by dividing the difference of the pretax and posttax economic rent by the net present value of the pretax income stream, net of depreciation  $p / (1 + r)$ .

$$EATR = (R_t^* - R_t) / (p / (1 + r))$$

Author calculations are available upon request.

## Example

Canada's tax policy in the late 1980s provides a good example of how depreciation allowances can affect the effective average corporate tax rate. In 1986, Canada provided a 33 percent depreciation allowance and required depreciation to be calculated with the straight line method. In 1987, Canada undertook base-broadening tax reform and lowered its depreciation allowance to 20 percent calculated with the declining balance method. The large allowance cut corresponded with a 24 percent drop in  $A$ , the net present value of allowances over  $\tau$ .  $A$  fell from 0.88 to 0.67. At the same time, though, Canada cut its combined top statutory tax rate from 49.8 percent in 1986 to 48.5 percent in 1987. The net effect on Canada's effective average corporate tax rate was a large increase, from 31.4 percent to 42.0 percent. Large allowance cuts overwhelmed smaller statutory rate cuts.