

Macroeconomic analysis of a revenue-neutral reduction in the corporate income tax rate financed by an across-the-board limitation on corporate interest expenses

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working world

Executive Summary

Study:

- ▶ Estimation of the long-run macroeconomic impact on the US economy from a revenue-neutral reduction in the corporate income tax (CIT) rate financed by an across-the-board limitation on corporate interest expenses*
 - ▶ Specifically, a 25% across-the-board limitation on corporate interest expenses and the approximately 1.5 percentage-point reduction in the CIT rate it could finance are analyzed

Findings:

- ▶ The net effect of this policy change would adversely affect the US economy in the long-run**
 - ▶ Output is estimated to fall by 0.2% in the long-run (\$33.6 billion in today's economy)
 - ▶ Investment is estimated to fall by 0.3% (\$6.0 billion in today's economy)
 - ▶ Economic welfare, measured by the value of households' consumption and their leisure, is estimated to fall by 0.4%
 - ▶ Total employee compensation is estimated to fall by 0.05% (\$4.7 billion in today's economy), although employment is estimated to rise by 0.05% (0.06 million full-time equivalent employees in today's economy) due primarily to the higher cost of investment

* For models of this type, roughly two-thirds to three-quarters of the long-run effect is generally reached within a decade.

** Estimates are long-run effects shown in relation to the size of US economy in 2013. Industry and by-state estimates are provided in Appendix A.

Executive Summary (cont.)

- ▶ The negative impact of the limitation on corporate interest expenses more than offsets the positive impact of the reduction in the CIT rate
 - ▶ The increase in the cost of investment from the limitation on corporate interest expenses more than offsets the combined benefit of the reduction in the CIT rate and the improved economic efficiency from the more even tax treatment by source of financing
- ▶ The additional taxation from the net effect of the policy would increase the cost of investment and decrease the return to new investment (e.g., an investment would need to earn significantly higher returns to remain profitable)
 - ▶ In the corporate sector, the return to new investment would be, on average, 9.6% lower
 - ▶ In the business sector as a whole, the return to new investment would be, on average, 6.2% lower

Model:

- ▶ The EY General Equilibrium Model of the US Economy is used to estimate the policy impact on key macroeconomic variables in the long-run

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A limitation on corporate interest expenses has been included in several tax reform plans

- ▶ This analysis considers the impact of a revenue-neutral reduction in the corporate income tax rate financed by a 25% across-the-board limitation on corporate interest expenses
- ▶ A limitation on the deductibility of corporate interest expenses has been identified as a possible source of additional revenue to help finance a reduction in the corporate income tax (CIT) rate in several tax reform plans*
 - ▶ The Wyden-Coats tax plan proposed limiting the deductibility of corporate interest to its noninflationary (real) component, a proposal equivalent to a 25% across-the-board limit on interest deductibility (April 2011)
 - ▶ The President's *Framework for Business Tax Reform* identified reducing the tax bias toward debt financing as one of four key elements for business tax reform (February 2012)

* The Bipartisan Tax Fairness and Simplification Act of 2011, S. 727, 112th Cong., 1st Sess. (2011) and White House, *President's Framework for Business Tax Reform*, February 2012.

The bias for debt financing under the current tax system is not due to the deductibility of interest, but primarily other features of the US tax code

- ▶ The general deductibility of corporate interest expenses applies long-standing income tax principles that allow interest expenses to be deducted as a legitimate business expense dating back to the inception of the corporate income tax in 1909
- ▶ The bias for debt financing under the current system is not due to the deductibility of interest, but primarily other features of the US tax code:
 - ▶ The double tax on corporate profits. The double tax increases the tax on equity-financed investments first subject to the CIT and then to shareholder level taxation on dividends or capital gains. The double tax creates a tax bias against equity-financed investments, and thus a tax bias for debt.
 - ▶ Tax-exempt investments. In pursuit of various policy objectives, Congress has chosen to exclude or lightly tax a significant share of interest income. Such policies include not taxing income from interest on debt held within retirement savings accounts and pension funds to encourage retirement savings, and allowing nonprofit organizations (e.g., university endowments) to hold debt and other investments that are largely untaxed to provide support to the activities of this sector.
 - ▶ Foreign investors. Investment returns received by foreign investors are generally the subject to tax treaties negotiated between the United States and other countries and ratified by the Congress. These treaties generally subject investment returns, including debt financed investments, to relatively low withholding tax rates.

EY analysis of lower CIT rate and Wyden-Coats across-the-board limitation on corporate interest expenses

- ▶ This analysis estimates the long-run macroeconomic impact on the US economy from a revenue-neutral reduction in the CIT rate financed by an across-the-board limitation on corporate interest expenses*
- ▶ In particular, the across-the-board limitation on corporate interest expenses as proposed by the Wyden-Coats tax plan is analyzed:
 - ▶ This provision would limit the deductibility of corporate interest to its noninflationary (real) component
 - ▶ Based on the historical relationship of interest rates and inflation over the past two decades, this proposal is found to be equivalent to a roughly 25% limit on interest deductibility
 - ▶ The Joint Committee on Taxation (JCT) estimated that this provision would raise \$162.7 billion in revenue over ten years**
 - ▶ This is an amount of revenue sufficient to reduce the CIT rate by roughly 1.5 percentage points within the ten-year budget window

* For models of this type, roughly two-thirds to three-quarters of the long-run effect is reached within a decade.

** Joint Committee on Taxation, "Estimated revenue effects of S. 3018, The Bipartisan Tax Fairness and Simplification Act of 2010," November 2, 2010. Note that these estimates are for the earlier Wyden-Gregg tax plan, which included an identical limitation on the deductibility of interest expenses.

Policy change increases the marginal effective tax rate (METR) on new corporate investment

- ▶ A revenue-neutral reduction in the CIT rate financed by an across-the-board limitation on corporate interest expenses has been found to discourage investment through a higher METR – a measure of the additional economic profit needed for a new investment to cover taxes over its life – on investment*
- ▶ The METR is a standard measure used to analyze investment incentives across investment types, by source of financing and on the overall level of investment and is frequently used to inform tax policy discussions:
 - ▶ For example, see President’s *Framework for Business Tax Reform* (2012), Congressional Research Service (2011), Treasury Competitiveness Report (2007), Congressional Budget Office (2005), 2005 Bush Tax Panel, 2000 Treasury Depreciation Study and 1986 Tax Reform Act analyses**

* Robert Carroll and Tom Neubig, *Business Tax Reform and the Tax Treatment of Debt: Revenue neutral rate reduction financed by an across-the-board interest deduction limit would deter investment*, An Ernst & Young LLP report prepared on behalf of the PEGCC, May 2012.

** White House, *President’s Framework for Business Tax Reform*, February 2012; Jane G. Gravelle and Donald J. Marples, *Tax Rates and Economic Growth*, December 5, 2011; US Department of the Treasury, *Approaches to Improve the Competitiveness of the U.S. Business Tax System for the 21st Century*, December 20, 2007; Congressional Budget Office, *Taxing Capital Income: Effective Rates and Approaches to Reform*, October 1, 2005; The President’s Advisory Panel on Federal Tax Reform, *Simple, Fair, & Pro-Growth: Proposals to Fix America’s Tax System*, November 1, 2005; US Department of the Treasury, *Report to the Congress on Depreciation Recovery Periods and Methods*, July 2000; James B. Mackie, (2002), “Unfinished Business of the 1986 Tax Reform Act: An Effective Tax Rate Analysis of Current Issues in the Taxation of Capital Income,” *National Tax Journal*, Vol. 45(2), June, pp. 293-337.

CIT rate reduction and across-the-board limitation on corporate interest expenses impacts US economy in two ways

- ▶ The net effect of the policy change in 2013 would be to increase the marginal effective tax rate (METR) for new investment in the corporate sector by 9.6% and in the business sector as a whole by 6.2%, thus discouraging investment
 - ▶ This METR implies that the return to a new investment in the corporate sector would be, on average, 9.6% lower and in the business sector as a whole, on average, 6.2% lower due to the additional taxation from the net effect of the policy
- ▶ A revenue-neutral reduction in the CIT tax rate financed by a limitation on corporate interest expenses promotes a more efficient allocation of capital in the US economy by moving toward a more level tax playing field between debt and equity
 - ▶ The METR for a debt-financed investment would rise from 0.4% to 17.7%, but would remain largely unchanged for an equity-financed investment (falling from 38.8% to 37.6%)
- ▶ This policy also further discourages investment in the corporate sector
 - ▶ The METR for new corporate investment would increase from 29.2% to 32.0%, but would remain unchanged at 24.8% for noncorporate investment*

* The noncorporate sector is defined here to include businesses organized as partnerships, S corporations, limited liability companies, and sole proprietorships.

Effect of CIT rate reduction and across-the-board limitation on corporate interest expenses on METRs in 2013

	<u>Current law</u>	<u>Proposal</u>	<u>% change</u>
Business sector	27.6%	29.3%	6.2%
Corporate sector	29.2%	32.0%	9.6%
Equipment	20.0%	23.7%	18.5%
Structures	25.8%	29.0%	12.4%
Land	39.7%	41.8%	5.3%
Inventories	37.8%	39.3%	4.0%
Debt finance	0.4%	17.7%	N/A
Equity finance	38.8%	37.6%	-3.1%
Noncorporate sector	24.8%	24.8%	0.0%
Equipment	14.4%	14.4%	0.0%
Structures	20.6%	20.6%	0.0%
Land	37.1%	37.1%	0.0%
Inventories	34.3%	34.3%	0.0%
Owner-occupied housing	-2.4%	-2.4%	0.0%
Economy-wide	20.0%	21.3%	6.5%

Source: Ernst & Young LLP.

EY General Equilibrium Model of the US Economy

- ▶ The EY General Equilibrium Model of the US Economy is used to analyze the long-run impact of this revenue-neutral policy change on the US economy*
- ▶ The macroeconomic impacts are measured by changes in:
 - ▶ Output, investment, capital stock, labor supply, employment and after-tax wages, as well as industry-specific effects
- ▶ The impact of the policy change throughout US economy is estimated
 - ▶ The policy change initially affects the METR for new investment in the corporate sector
 - ▶ This change ripples throughout the economy until after-tax returns are equalized
- ▶ This policy change is revenue neutral and, as a result, there is no need for a countervailing change in fiscal policy (e.g., a change in government spending or revenues)

* For models of this type, roughly two-thirds to three-quarters of the long-run effect is generally reached within a decade.

Net effect of interest limitation and lower CIT rate would adversely affect the US economy in the long-run

- ▶ This analysis finds that, on net, a revenue-neutral reduction in the CIT rate financed by an across-the-board limitation on corporate interest expenses would adversely affect the US economy in the long-run*
 - ▶ Output is estimated to fall by 0.2% in the long-run (\$33.6 billion in today's economy)
 - ▶ Investment is estimated to fall by 0.3% (\$6.0 billion in today's economy)
 - ▶ Economic welfare, measured by the value of households' consumption and their leisure, is estimated to fall by 0.4%
 - ▶ Total employee compensation is estimated to fall by 0.05% (\$4.7 billion in today's economy), although employment is estimated to rise by 0.05% (0.06 million full-time equivalent employees in today's economy) due primarily to the higher cost of investment
- ▶ The increase in the cost of investment from the limitation on corporate interest expenses more than offsets the combined benefit of the reduction in CIT rate and the efficiency benefit from a more even tax treatment by source of financing

* Estimates are long-run effects shown in relation to the size of US economy in 2013. These estimates are available by industry and by state in Appendix A.

Long-term macroeconomic impact

Long-term macroeconomic impacts of a revenue-neutral reduction in the CIT rate financed by a 25% across-the-board limit on corporate interest deductions

	% change from current law	Change from current law (\$billions at 2013 levels)*
Output	-0.21%	-\$33.6
Consumption	-0.20%	-\$23.0
Investment	-0.28%	-\$6.0
Capital stock	-0.85%	-\$421.4
Employee compensation	-0.05%	-\$4.7
Employment (1,000s)	0.05%	60
Total welfare	-0.41%	N/A

* Amounts are the estimated long-run impacts, but expressed at 2013 levels. Generally, in models of this type, roughly two-thirds to three-quarters of the long-run effect is generally reached within a decade. The estimated employment effects are positive because of the substitution of labor for capital associated with the higher cost of investment.

Long-term macroeconomic impact (cont.)

- ▶ The revenue-neutral tax policy change of a lower CIT rate financed by a 25% across-the-board limitation on corporate interest deductions results in a 0.21% decrease in the long-run US output*
- ▶ Due to the decrease in the relative price of labor to capital, this tax policy change results in an increase in labor intensity throughout the US economy
 - ▶ This substitution of labor for capital results in an increase in long-run employment of 0.05%, but a 0.05% decrease in long-run after-tax compensation due to a lower long-run after-tax wage (i.e., more hours are worked for a lower wage)
- ▶ Total welfare, an abstract measure of the well-being of US households equivalent to the value of their consumption and leisure, is estimated to fall by 0.4%

* For models of this type, roughly two-thirds to three-quarters of the long-run effect is generally reached within a decade.

Assumptions and limitations of analysis

Any modeling effort is only a rough approximation to reality, and the modeling in this report is no exception. Although many caveats might be added to the analysis, several are particularly noteworthy:

- ▶ **Estimates based on stylized depiction of the US economy.** The general equilibrium model used for this analysis is, by its very nature, a highly stylized depiction of the US economy intended to capture key details important to the effects of a tax policy change
- ▶ **US on a fiscally sustainable path.** The model assumes the United States is on a fiscally sustainable path under current law and remains on a fiscally sustainable path after the policy change, when neither may necessarily be the case
- ▶ **Wyden-Coats interest limitation depicted by historical relationship.** The Wyden-Coats across-the-board corporate interest limitation is approximated by the historical relationship of inflation and interest rates. The actual limitation would depend on the future trends in both inflation and interest rates
- ▶ **Estimates limited by calibration.** This model is calibrated to the recent US economy and, because any particular year contains unique events, no particular baseline year is completely generalizable
- ▶ **Based on preliminary JCT revenue estimate.** The revenue-neutral policy change in the CIT rate and the across-the-board limitation on corporate interest expenses is based on preliminary revenues estimates of these provisions by the JCT

Sensitivity of the results

- ▶ The results reported above depend, in part, upon how sensitive households and businesses are to changes in tax policy, in particular the degree to which tax policy influences the decision to save or spend and the decision between labor or leisure
- ▶ Because there is some degree of uncertainty in exactly what household parameter values should be used, a base case suggested by the economic literature was utilized and scenarios with lower and higher responsiveness were assumed to show the sensitivity of the results to the underlying assumptions

	% change from current law		
	Base	Low	High
Output	-0.21%	-0.20%	-0.21%
Consumption	-0.20%	-0.20%	-0.21%
Investment	-0.28%	-0.26%	-0.31%
Capital stock	-0.85%	-0.83%	-0.86%
Employee compensation	-0.05%	-0.05%	-0.06%
Employment	0.05%	0.05%	0.04%
Total welfare	-0.41%	-0.39%	-0.42%

Note: Parameter values used in the base, low and high responsiveness scenarios are provided in Appendix B.

Appendix



Appendix A: Industry-specific macroeconomic output effects

	Long-run change in output (%)	Long-run change in output (\$million)
Agriculture, forestry, fishing and hunting	-0.13%	-\$250
Mining, quarrying and oil and gas extraction	-0.13%	-400
Utilities	-0.01%	-30
Construction	-0.26%	-1,470
Manufacturing	-0.19%	-3,760
Wholesale and retail trade	-0.25%	-4,830
Transportation and warehousing	-0.21%	-980
Information	-0.10%	-720
Finance, insurance and real estate	-0.01%	-270
Business services	-0.25%	-5,130
Non-business services	-0.25%	-6,110
Total change in business sector output:		-\$23,950

Note: Estimates are long-run effects shown in relation to the size of US economy in 2013.

Appendix A: Industry-specific macroeconomic compensation effects

	Long-run change in compensation (%)	Long-run change in compensation (\$million)
Agriculture, forestry, fishing and hunting	-0.01%	-\$10
Mining, quarrying and oil and gas extraction	0.07%	60
Utilities	0.13%	110
Construction	-0.13%	-510
Manufacturing	0.01%	130
Wholesale and retail trade	-0.11%	-1,080
Transportation and warehousing	-0.07%	-190
Information	0.07%	190
Finance, insurance and real estate	0.22%	1,420
Business services	-0.09%	-1,260
Non-business services	-0.09%	-1,560
Total change in business sector compensation:		-\$2,710

Note: Estimates are long-run effects shown in relation to the size of US economy in 2013.

Appendix A: Long-run state-by-state output effects

	\$million		\$million
United States	-\$33,620	Missouri	-570
Alabama	-400	Montana	-90
Alaska	-110	Nebraska	-210
Arizona	-580	Nevada	-290
Arkansas	-240	New Hampshire	-140
California	-4,360	New Jersey	-1,100
Colorado	-590	New Mexico	-180
Connecticut	-490	New York	-2,490
Delaware	-130	North Carolina	-980
District of Columbia	-270	North Dakota	-90
Florida	-1,730	Ohio	-1,100
Georgia	-950	Oklahoma	-350
Hawaii	-160	Oregon	-440
Idaho	-130	Pennsylvania	-1,310
Illinois	-1,510	Rhode Island	-110
Indiana	-620	South Carolina	-390
Iowa	-320	South Dakota	-90
Kansas	-290	Tennessee	-630
Kentucky	-380	Texas	-2,880
Louisiana	-540	Utah	-280
Maine	-120	Vermont	-60
Maryland	-700	Virginia	-1,000
Massachusetts	-880	Washington	-800
Michigan	-880	West Virginia	-150
Minnesota	-630	Wisconsin	-570
Mississippi	-230	Wyoming	-80

Note: Estimates are long-run effects shown in relation to the size of US economy in 2013. Figures may not sum due to rounding.

Appendix A: Long-run state-by-state compensation effects

	\$million		\$million
United States	-\$4,700	Missouri	-90
Alabama	-60	Montana	-10
Alaska	-20	Nebraska	-30
Arizona	-90	Nevada	-50
Arkansas	-40	New Hampshire	-20
California	-600	New Jersey	-150
Colorado	-90	New Mexico	-30
Connecticut	-40	New York	-190
Delaware	-10	North Carolina	-140
District of Columbia	-70	North Dakota	-10
Florida	-270	Ohio	-170
Georgia	-140	Oklahoma	-50
Hawaii	-30	Oregon	-60
Idaho	-20	Pennsylvania	-190
Illinois	-200	Rhode Island	-20
Indiana	-80	South Carolina	-60
Iowa	-30	South Dakota	-10
Kansas	-40	Tennessee	-90
Kentucky	-60	Texas	-370
Louisiana	-70	Utah	-40
Maine	-20	Vermont	-10
Maryland	-130	Virginia	-190
Massachusetts	-120	Washington	-120
Michigan	-130	West Virginia	-20
Minnesota	-80	Wisconsin	-70
Mississippi	-40	Wyoming	-10

Note: Estimates are long-run effects shown in relation to the size of US economy in 2013. Figures may not sum due to rounding.

Appendix B: Overview of the EY General Equilibrium Model of US Economy

- ▶ Tax policy affects the incentives to work, to save and invest, to allocate capital and labor among competing uses and for households to consume different mixes of consumption goods
- ▶ Industries can substitute between capital and labor, and in an open economy, international capital flows between the US economy and the rest of the world
- ▶ Capital responds to differences in the after-tax return to capital by substituting between sectors (i.e., corporate, noncorporate), industries, and type of financing (i.e., debt, equity)
- ▶ Model includes 4 sectors (corporate, noncorporate, owner-occupied housing and government), 13 industries and 76 asset types

Appendix B: Overview of the EY General Equilibrium Model of US Economy (cont.)

- ▶ Differences between industries are explicitly modeled
 - ▶ Treatment under the tax code such as through the treatment of inventories (i.e., LIFO and FIFO) and the domestic production deduction
 - ▶ Types of assets (i.e., different mixes of equipment, structures, inventories and land) and their treatment in regard to tax depreciation deductions
 - ▶ Mix of capital and labor across industries
 - ▶ The concentration of corporate and noncorporate legal forms across industries
 - ▶ The varying role of debt and equity in financing investments across industries
 - ▶ Elasticity of substitution between capital and labor
 - ▶ Industry output required in final use consumption goods
- ▶ The model generally follows the framework of Ballard, Fullerton, Shoven and Whalley (1985) and Fullerton and Henderson (1989)

Appendix B: Debt and equity in the EY General Equilibrium Model of US Economy

- ▶ There is an extensive economic literature on capital structures which note that, while there is a deduction for interest, there is not a deduction for dividends or retained earnings
- ▶ An International Monetary Fund (2011) working paper performed a meta analysis of this literature to provide a “consensus estimate” of this effect based on 267 estimates across 19 different studies
 - ▶ The IMF paper reports a tax elasticity of debt between 0.5 and 0.7 (i.e., a one percentage point increase in the CIT rate will result in a 0.5 to 0.7 percent increase in leverage)
- ▶ In this model, each of the 13 industries tradeoff between the use of debt and equity to finance investments based on an elasticity of 0.6

* Ruud A. de Mooij, (2011), “The Tax Elasticity of Corporate Debt: A Synthesis of Size and Variations,” International Monetary Fund, Working Paper, WP-11-95.

Appendix B: Structure of EY General Equilibrium Model of the US Economy

- ▶ The EY General Equilibrium Model of the US Economy works through a nested utility function with eight distinct layers
 - ▶ (1) Households choose between present consumption and future consumption (i.e., savings). Savings become real capital in the next time period of the model
 - ▶ (2) Households choose what portion of their labor endowment is used for work (and thereafter spent on consumption goods) and what portion to consume as leisure
 - ▶ (3) Households choose what mix of 15 consumption goods to purchase with the income earned from working
 - ▶ (4) Each consumption good is a fixed coefficient mix of 13 industry, owner-occupied housing and government outputs (i.e., producer goods)
 - ▶ (5) The producer goods are a fixed proportion of value added and intermediate goods

Appendix B: Structure of EY General Equilibrium Model of the US Economy (cont.)

- ▶ (6) Value added within each industry is an endogenous mix of capital and labor
 - ▶ (7) Industries choose an endogenous mix of the corporate and noncorporate legal forms subject to their preferences and cost minimization
 - ▶ (8) Within each legal form, industries choose an endogenous mix of debt-financed investment and equity-financed investment subject to their preferences and cost minimization
-
- ▶ A general equilibrium framework solves for equilibrium prices in factor (i.e., capital and labor) and goods markets while simultaneously taking into account the behavioral responses of individuals and businesses to the changes in tax policy
 - ▶ That is, each of these 8 nests are solved simultaneously
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- ▶ Key parameter values are provided in the table below

Appendix B: Key model parameters

	Sensitivity		
	Base	Low	High
Household present consumption versus savings decision			
Elasticity of substitution (CES)	1.70	1.50	1.90
Present consumption weight	0.75	0.60	0.90
Household labor versus leisure decision			
Elasticity of substitution (CES)	0.80	0.70	0.90
Leisure weight*	0.10	0.14	0.07
Industry elasticity of substitution between debt and equity	0.60	0.50	0.70
Baseline financing of business investment by source			
Debt-financed investment	35%	35%	35%
Equity-financed investment	65%	65%	65%
Retained earnings	65%	65%	65%
New shares	35%	35%	35%
Corporate investment	63%	63%	63%
Noncorporate investment	37%	37%	37%
Industry capital-labor elasticity of substitution			
Maximum elasticity	0.80	0.80	0.80
Minimum elasticity	0.50	0.50	0.50

* This parameter is adjusted such that the baseline factor markets are comparable across the base, low and high scenarios.