

CORPORATE TAX REFORM: A MACROECONOMIC PERSPECTIVE

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There has been considerable recent interest in reducing the corporate tax rate. As a first step toward analyzing the macroeconomic consequences of such a reform, we consider a rate reduction from the current statutory rate of 35 to 30 percent. We present the results under differing assumptions about how the rate cut is paid for, as well as some sensitivity analysis of the impact of differing assumptions about Federal Reserve policy and differing assumptions about corporate finance.

Keywords: corporate tax reform, tax expenditures, fiscal policy

JEL Codes: E27, E32, H25, H32

1. INTRODUCTION

Economists have for many years argued that the corporate tax system is ripe for reform, in part because of the various economic distortions caused by the interaction of the corporate and individual income tax systems. Among these distortions are asymmetric tax treatments of debt versus equity, capital-intensive versus non-capital-intensive firms, domestic versus foreign income, and pass-through entities versus those in corporate form.¹

Interest in reducing the federal corporate tax rate from its current statutory level of 35 percent for most corporations has been building for several years. In 2007, House Ways and Means Committee Chairman Charles Rangel introduced the Tax Reduction and Reform Act of 2007 which reduced the top statutory tax rate on corporate income

¹ A detailed discussion of these issues is beyond the scope of this paper, but is provided by Gravelle (1994) and Auerbach (2002).

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to 30.5 percent and paid for that change with the repeal of the domestic manufacturing deduction, changes in the treatment of foreign source income, and modifications of inventory accounting rules including elimination of last-in, first-out accounting. In 2010, several proposals to overhaul the corporate income tax were put forward, including: (1) a proposal by Senator Ron Wyden and Senator Judd Gregg to establish a single corporate tax rate of 24 percent; (2) a proposal by co-chairs Erskine Bowles and former Senator Alan Simpson of the National Commission on Fiscal Responsibility and Reform to reduce the corporate rate to between 23 and 29 percent and eliminate all other corporate tax expenditures; and (3) a proposal by former Senator Peter Domenici and Alice Rivlin to reduce the corporate rate to 27 percent. In 2011, Ways and Means Committee Chairman Dave Camp, House Budget Committee Chairman Paul Ryan, and President Barack Obama have expressed an interest in reducing the corporate tax rate. President Obama announced his desire for a lower tax rate on January 25, 2011 in his State of Union address, in which he argued legislation should be enacted to, “Get rid of the loopholes. Level the playing field. And use the savings to lower the corporate tax rate for the first time in 25 years — without adding to our deficit.”

As indicated by President Obama in the quote above, a key component of most of these corporate reform plans is that they would reform corporate taxation on a revenue-neutral basis. Most of the plans argue that this should be done by eliminating provisions in the corporate income tax that provide special tax treatment for specific industries or types of corporate activity. Essentially the idea is to lower corporate statutory tax rates and broaden the corporate tax base, ideally reducing marginal tax rates on corporations, in order to increase incentives for investment in U.S.-based corporations by increasing their after-tax rate of return on investment.

The staff of the Joint Committee on Taxation (JCT) and the Office of Tax Analysis of the U.S. Department of Treasury prepare annual lists of estimates of corporate tax expenditures, pursuant to the Congressional Budget and Impoundment Control Act of 1974. Tax expenditures are defined in that act as “revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability.”² These tax expenditures provide a logical starting place for identifying base broadening opportunities. However, most of the largest corporate tax expenditures affect marginal incentives, either by affecting the corporate effective marginal tax rate or by affecting the cost of capital through accelerated depreciation and expensing provisions. Only a few of the largest corporate tax expenditures can be categorized as infra-marginal and thus possible base broadeners, and these provisions have their own limitations as reform measures. The economic incentives posed by the largest corporate tax expenditures are discussed in more detail in section II.B. below.

² Congressional Budget and Impoundment Control Act of 1974 (Public Law No. 93-344, section 3(3)).

We analyze the macroeconomic effects of reducing the corporate rate to 30 percent.³ We consider three ways of paying for such a corporate rate cut. First, we consider the macroeconomic effects of a rate reduction that is paid for by increased borrowing. Second, we consider a rate reduction that is paid for by “idealized” base broadening. We do not specify any particular policy, but assume that tax expenditures can be eliminated in such a way as to completely pay for the marginal rate cut on a year-by-year basis, without affecting marginal investment incentives. Third, taking account of the possibility that idealized base broadening may be difficult to achieve, we consider a reform that is paid for by eliminating a tax expenditure that affects marginal incentives, a partial repeal of the Modified Accelerated Cost Recovery System (MACRS).⁴ By partial repeal of MACRS, we assume that MACRS depreciation lives are lengthened proportionately such that the revenue raised over the budget horizon equals the revenue lost from the corporate rate cut. Before presenting the results of our modeling, we first provide some context by examining briefly corporate taxes, corporate tax expenditures, and their incentive effects on growth.

II. A (SIMPLIFIED) THEORY OF CORPORATE INVESTMENT

Long-term economic growth is determined by an economy’s ability to increase its productive capacity by adding to its supply of labor, capital, and technology. The effects of corporate reform on the economy will be determined by how the reform influences decisions to add to the stock of capital, that is, to increase investment. Investment decisions are based on the investor’s expected after-tax return on investment. In calculating the after-tax expected rate of return on a corporate investment, the investor will take into account not only the individual income taxes he expects to pay directly on his income from the corporation (capital gains taxes and dividend taxes), but also how the corporate tax system will impact net corporate profits, which impact his own future wealth and receipts from his investment. In addition to considering the expected gross return on assets purchased by the corporation, the investor takes into account such things as the corporate tax rate, the tax treatment of depreciation, and any applicable tax credits associated with the investment.

The theoretical framework that describes this decision-making process is often referred to as “user cost of capital” analysis, and has been the subject of an extensive literature.⁵ A key feature of this framework is that it takes into account the net present

³ We assume the corporate AMT is unchanged. We deliberately model a fairly small rate change. In the face of a large rate change, there would be many potential behavioral effects, such as incentives to shift from pass-through form to corporate, incentives to shift from debt-financing to equity financing, and incentives to operate firms in the U.S. versus abroad. By considering only a small rate change, it is reasonable to treat these incentives as small enough to be ignored.

⁴ Repeal of MACRS is also considered in the Wyden-Gregg and Domenici-Rivlin tax reform proposals.

⁵ Jorgenson (1963) formalized this framework in a way that still provides a starting point for economic modeling purposes. Hall and Jorgenson (1967) added taxation to the analysis.

value of the streams of costs and revenues associated with the use of capital throughout its economic life. The tax depreciation of capital is an important component of this calculation. Because partial repeal of MACRS is one of the methods for financing the corporate tax cut analyzed in this paper, we provide a brief discussion of recent evidence about the influence of changes in tax depreciation on investment decisions.

Changes to federal tax law on the deductibility of capital investment have provided economists with several natural experiments to measure the responsiveness of capital investment to taxation. In 2002, “bonus depreciation” was first enacted. In general, it allowed current year expensing for 30 percent of expenditures on qualified capital with a MACRS life of 20 years or less. This provision was temporary — to be in effect for three years starting on September 11, 2001 and ending on September 10, 2004. In 2003, the expensing portion was increased to 50 percent, and the eligible period was extended through the end of 2004.⁶ House and Shapiro (2008) found a very high level of responsiveness to these policies.

Bond and Xing (2010) analyzed the effects of changes in corporate taxation on corporate investment using panel data for the United States, Japan, Australia, and 10 European Union countries from 1982–2007. Employing a user cost of capital framework, they find a very strong influence of taxation on investment, particularly investment in equipment.

Edgerton (2011) took a slightly different approach to analyzing the effects of tax incentives on investment. He hypothesized that corporate investment may be less sensitive to changes in tax depreciation than would be implied by the user cost framework because investors have more information about the financial accounting treatment of the cost of capital than the timing of tax payments. He compared the effects of tax incentives for a policy where tax treatment and accounting treatment are the same (investment tax credits) to policies where they differ (bonus depreciation). He found that while both policies resulted in increased investment, there was a larger response to investment tax credits than to bonus depreciation.

One special topic in this literature is the role of dividends. For corporations for which the amount of dividend issuance is not affected by after-tax profits, the dividend tax rate would not be included in the user cost of capital; this is referred to as “new view” analysis of the cost of capital. In contrast, the traditional, or “old view,” analysis incorporates dividends in the user cost, implicitly assuming that firms base dividend issuance on after-tax profits.⁷ Empirical evidence on how firms determine dividend issuance has generally shown about half to be traditional and about half to be “new view,” so our baseline assumptions assume that firms are evenly split between these two types.⁸ There is some recent evidence that firms are more likely to be in the “new view” camp (Hassett and Newmark, 2008). Thus, we show how some of our results are affected by varying the share of traditional and new view firms.

⁶ Bonus depreciation also was enacted in 2008, and has been extended through 2012. But there has been limited empirical examination of these more recent effects.

⁷ Auerbach (2002) provides an overview of the corporate finance literature.

⁸ Auerbach and Hassett (2003) present evidence supporting this assumption.

A. Corporate Taxes

In 2007, corporations paid a total of \$370.2 billion in federal taxes, representing approximately 14.4 percent of total tax receipts.⁹ The Federal corporate income tax has four statutory rates that apply to corporate taxable income: a 15 percent rate on the first \$50,000; a 25 percent rate on the next \$25,000 of income; a 34 percent rate on income in excess of \$75,000 and less than \$10 million; and finally a 35 percent rate on income in excess of \$10 million. The three lower rates are phased out for corporations in higher income ranges. While the statutory rate for most corporations is 35 percent, the average rate paid by active corporations in 2007 was approximately 26 percent.¹⁰

Corporate receipts have varied quite a bit over time and are smaller relative to gross domestic product (GDP) than they have been in the past. Figure 1 shows corporate profits and tax receipts as a percentage of GDP from 1946–2008. Corporate receipts peaked in 1952 at 5.9 percent of GDP. Since 1978 corporate receipts as a percentage of GDP have varied between 1 and 2.6 percent. Corporate profits as a share of GDP peaked in 1950 at 14.7 percent, and reached their lowest level in 1986 at 5.7 percent. Recently, corporate profits as a share of GDP surged to 13.6 percent in 2006.

Figure 2 compares corporate income taxes among the Organisation for Economic Co-operation and Development (OECD) countries in 2007. The left hand vertical axis shows corporate income tax receipts as a percentage of GDP. The right hand vertical axis shows the top statutory federal corporate tax rates adjusted for local tax deductions. In 2007, the United States collected slightly less than the unweighted average amount collected by OECD countries of 3.8 percent of GDP. However, the United States had one of the highest top statutory rates. Many have interpreted information such as that provided in Figure 2 as suggesting that compared to other OECD countries, the United States could potentially broaden its tax base and lower statutory corporate rates without sacrificing significant revenues.

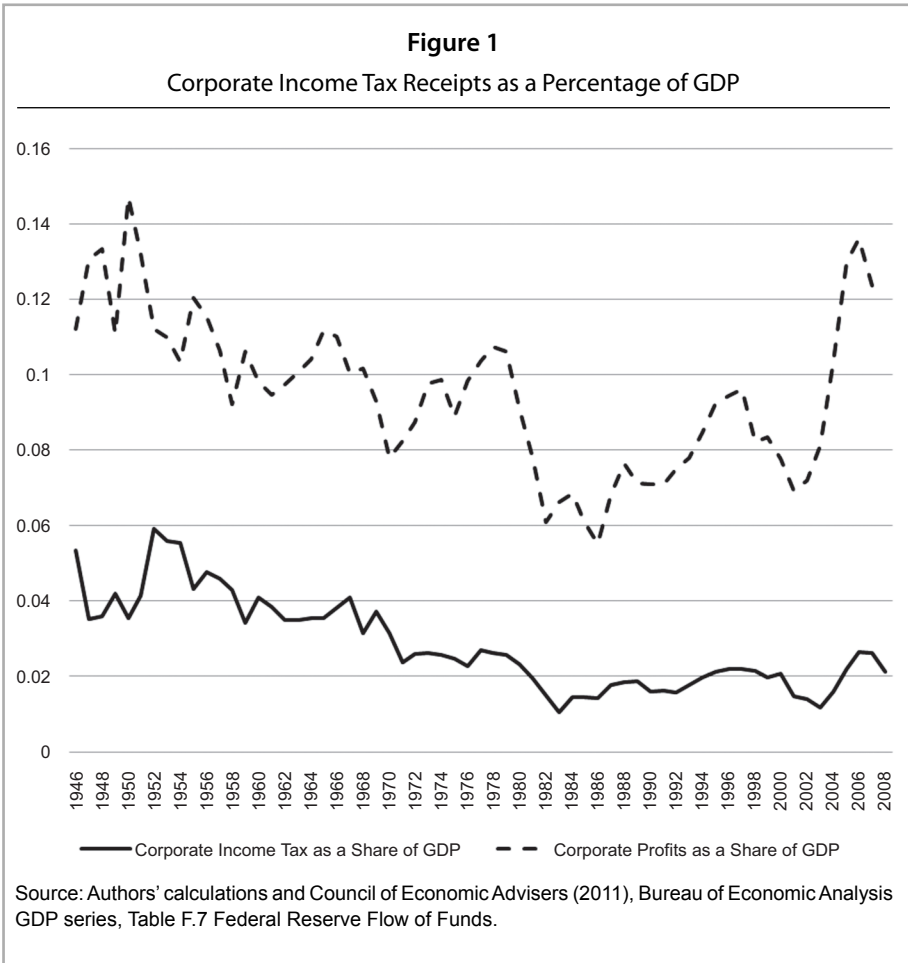
B. Corporate Tax Expenditures

As noted above, corporate tax expenditures are a convenient place to start in identifying ways to broaden the tax base to cover the cost of any rate reduction.

There are a number of deductions and credits that corporations can take advantage of to reduce their tax liability. JCT (2010) lists 146 tax expenditures that benefit corporations. Many of these tax expenditures are tiny; for instance the tax credit for the cost of carrying tax-paid distilled spirits in wholesale inventories has a tax expenditure totaling \$0.1 billion over 5 years. Table 1 shows the 10 largest corporate tax expenditures. These

⁹ See Table B-80 in Council of Economic Advisers (2011).

¹⁰ In 2007, returns of active non-pass through corporations had approximately \$1.2 trillion in taxable income after carry-forward of net operating losses and \$330 billion in tax liability as shown in Table 12 of Internal Revenue Service (2010). Total income tax before credits was \$436 billion.

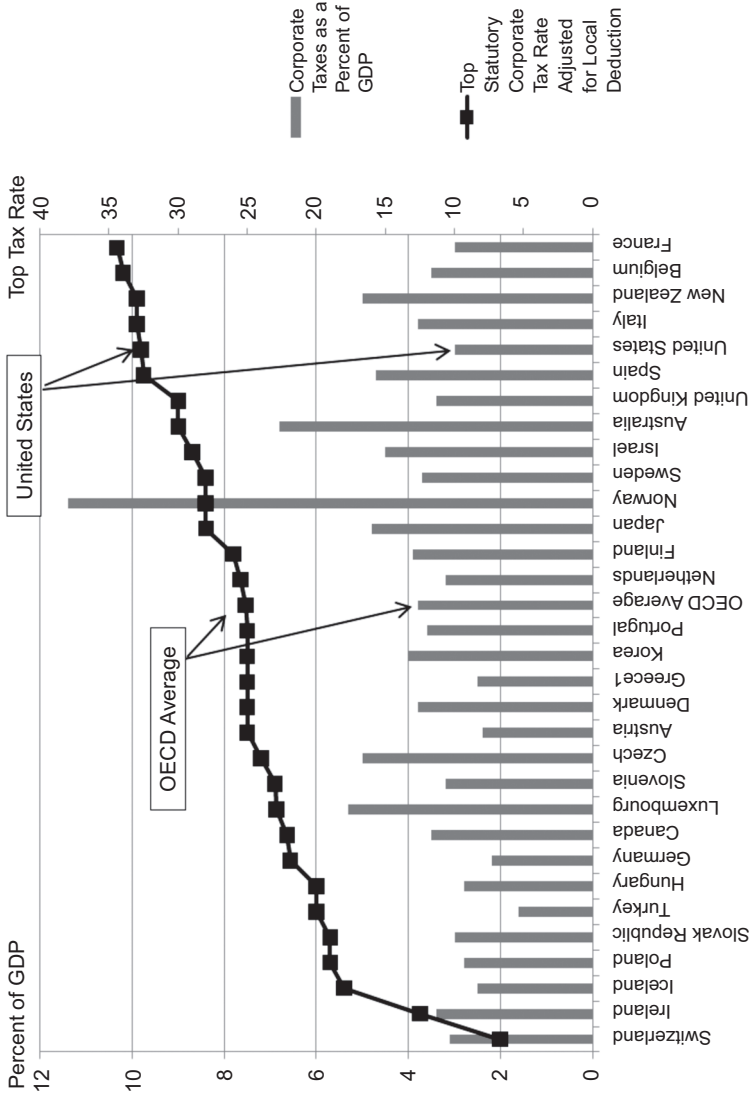


10 tax expenditures represent over two-thirds of total corporate tax expenditures.¹¹ In order for repeal of a corporate tax expenditure to increase tax revenues without affecting the effective marginal tax rate on corporations, the tax expenditure must be infra-marginal — that is, it would not change if corporate profits increased.

The largest corporate tax expenditure is the deferral of active income of controlled foreign corporations. There is substantial uncertainty about the effects of the tax provi-

¹¹ The Section 41 research credit which has an estimated corporate tax expenditure of \$12.0 billion would be ranked as the 13th largest tax expenditure. Notwithstanding that the Section 41 credit was in fact extended at the end of 2010, with a revenue cost of \$13.3 billion for the one year extension through 2011, the 2010 tax expenditure estimate assumed expiration at the end of 2010.

Figure 2
Corporate Income Taxes as a Percent of GDP in 2007 for OECD Countries



Source: Table 12 from OECD (2010) and Table II.1, corporate income tax rate from OECD (2011).

Table 1
10 Largest Corporate Tax Expenditures
(\$Billions)

Corporate Tax Expenditure and Function	2010	2011	2012	2013	2014	Total 2010–2014
Deferral of active income of controlled foreign corporation	12.5	13.3	14.1	14.9	15.8	70.6
Exclusion of interest on public purpose State and local government bonds	7.5	8.5	9.0	9.9	10.4	45.3
Deduction for income attributable to domestic production activities	7.0	8.4	8.8	9.2	9.8	43.2
Inventory property sales source rule exception	7.2	7.4	7.6	7.8	8.0	38.0
Depreciation of equipment in excess of the alternative depreciation system	24.1	6.5	–5.0	0.8	10.7	37.1
Inclusion of income arising from business indebtedness discharged by the reacquisition of a debt instrument	21.1	6.9	0.5	0.3	(1)	28.8
Credit for low-income housing	4.9	5.1	5.3	5.6	6.1	27.0
Expensing of research and experimental expenditures	4.3	4.2	4.4	5.8	6.9	25.6
Inventory methods and valuation: Last in first out	3.6	3.8	4.0	4.2	4.4	20.0
Reduced rates on first \$10,000,000 of corporate taxable income	3.2	3.2	3.2	3.1	3.1	15.9

Note: (1) Indicates a positive tax expenditure of less than \$50 million

Source: JCT (2010)

sions affecting foreign source income on U.S. corporate tax revenues and incentives to invest in the United States. Some suggest that repeal of deferral would effectively increase the worldwide corporate rate (both average and marginal) for U.S. multinational corporations.¹² The extent to which this would increase U.S. tax revenues depends on the ability of firms to avoid the tax consequences, which will depend in part on the extent to which they can relocate their tax address without disrupting their operations. Depending on how repeal of deferral is combined with repeal of other tax expenditures affecting multinational corporations, the increase in effective tax rates on U.S. corporations could provide an incentive for relocation of actual economic activities.

The second largest corporate tax expenditure is the exclusion of interest on public purpose state and local government bonds. Despite the fact that this tax expenditure is likely to be infra-marginal and is the second largest, repeal of the exclusion for corporations is unlikely to result in a significant increase in total tax receipts. Corporations hold a small portion of tax-exempt bonds, and reducing after-tax returns for corporate holders of these bonds would likely induce a shift in the ownership of these bonds to high-tax individuals, with little effect on revenue.

The sixth largest corporate tax expenditure, inclusion of income arising from business indebtedness discharged by the reacquisition of a debt instrument, has already expired, eliminating it as a potential revenue source.

The remaining seven large corporate tax expenditures are marginal in nature on an on-going basis. The third largest tax expenditure is the domestic production activities deduction in Sec. 199 of the Internal Revenue Code (hereafter, the section 199 deduction). The section 199 deduction is essentially a marginal rate reduction of 9 percent for qualifying manufacturers.¹³ Accelerated depreciation is the fifth largest expenditure and acts to reduce the marginal cost of capital.¹⁴ Repeal of the low income housing tax credit would increase the cost of capital in the housing sector. Similar to accelerated depreciation, expensing of research and experimental expenditures affects the marginal cost of investment. As of the writing of this paper, it is set to expire after December 31, 2011. And finally, because the reduced rates for smaller corporations are mostly phased out for larger corporations, repeal of the reduced rates would directly increase marginal rates for smaller corporations.

The two tax expenditures affecting deductions for inventory, the inventory property sales source rule exception and the last in, first out inventory method could be structured to raise significant revenues in the short-run without affecting investment incentives. These rules currently permit taxpayers to value inventory for deduction purposes as if the inventory were purchased/created at an earlier date when costs were much lower than the current acquisition price. Reversal of these rules, if applied to existing inven-

¹² For example, Grubert and Altshuler (2008) provide a discussion of the effects of their proposal to repeal deferral.

¹³ The effect of the section 199 deduction is only a 6 percent rate reduction for large oil producers.

¹⁴ The tax expenditure estimate for MACRS has historically varied substantially because of various temporary "bonus depreciation" provisions. In a steady state, it would be much larger.

tory, would amount to a lump-sum tax on existing inventories, generating revenues in the first year or two that would not be associated with a change in effective marginal tax rates. However, as the new rule is applied to inventory investment going forward, there are likely small marginal effects assuming inflation is correctly anticipated by businesses.

In summary, of the 10 largest corporate tax expenditures, only two can be characterized as potentially base broadening in that their repeal would increase the overall average corporate rate without affecting marginal tax rates in the short-run. Moreover, because these two are not particularly large they will not be able to pay for much of a statutory rate reduction. In order to expand the taxable corporate base without sacrificing the marginal incentive effects of most current corporate tax expenditures, it would be necessary to reform some or all of these tax expenditures to preserve their effects on after-tax returns, rather than simply to repeal them. For the purposes of the following analysis, in one of the simulations we assume that such a reform is possible. But the details of how to implement such reforms are beyond the scope of this paper.

III. MACROECONOMIC SIMULATION OF A CORPORATE RATE REDUCTION

A. MEG Model

To simulate corporate tax reform, we use the JCT staff's Macroeconomic Equilibrium Growth (MEG) model.¹⁵ The MEG model has several defining characteristics: (1) long-run equilibrium output is determined by the supply of capital and labor to the economy; (2) the economy is allowed to be out of equilibrium in the short term (though it is always converging back to equilibrium); (3) economic agents only react to current and past policy changes and do not react to future policy changes; and (4) it is possible to model different assumptions about the Federal Reserve's monetary policy response to fiscal policy changes. Incentives to work and invest are explicitly modeled as depending on after-tax returns to capital and labor; thus the MEG model allows us to simulate the long-run growth effects due to changes in marginal and average tax rates.

Changes in the corporate income tax are expected to affect economic output by changing incentives for investment. Specifically, in the MEG model, the amount of domestic capital available for investment is determined by the response of domestic savings and investment demand to changes in the after-tax rate of return on investment and the amount of federal government borrowing. The amount of international capital available for investment in the United States is responsive to changes in the U.S. demand for imports relative to foreign demand for U.S. exports, and to changes in interest rates, exchange rates, tax rates, and the global allocation of wealth.

¹⁵ A detailed description of the MEG model is provided in JCT (2003, 2005b).

In calculating the user cost of capital we include the net present value of tax depreciation.¹⁶ Under present law, tax depreciation schedules that are faster than economic depreciation reduce the after-tax cost of capital, increasing the after-tax rate of return on investment. Effective marginal tax rates on corporate income, dividend income, and capital gains are also components of this calculation. We use the JCT staff's micro-simulation models for the individual and corporate income taxes to determine average and effective marginal tax rates on the following sources of income: wages, dividends, interest, rents, capital gains, and corporate income under both present law and proposed policy changes.¹⁷

MEG simulations are run for each policy using two extreme assumptions about Federal Reserve Board behavior. In one variation (referred to as "MEG aggressive Fed response") it is assumed that the Federal Reserve Board acts aggressively by changing interest rates to counteract any demand effects provided by the simulated policy in each period. These simulations model Federal Reserve Board policy as if the Federal Reserve Board were omniscient and able to counteract fiscal policy demand effects almost completely with interest rate adjustments. In the other variation (referred to as "MEG neutral Fed response"), it is assumed that the Federal Reserve Board remains neutral with respect to any changes in fiscal policy, maintaining a fixed growth rate in the money supply, and thereby allowing temporary changes in demand to affect levels of employment and output. Neither of these simulations is an empirical prediction of actual Federal Reserve Board policy; rather, they are both stylized representations of different approaches to monetary policy.

In the current economic environment, with relatively high unemployment and slow growth, it seems reasonable to assume a more neutral policy response by the Federal Reserve Board. At the same time, with U.S. federal budget deficits expanding rapidly, from about 1 percent of GDP in fiscal year 2007 to more than 10 percent in fiscal year 2010, Federal Reserve policy might be expected to be more "aggressive" in response to the stimulative effects of deficit finance over time.¹⁸ By presenting the results of both simulations, we provide a sense of the range of possible effects. It seems likely that the "neutral" simulations would be more relevant for the short-run and the "aggressive" simulations would be more appropriate for the longer term.

There are limitations on the MEG model's ability to simulate all of the likely economic effects of corporate tax reform. The model does not include sectoral detail that could be of significance. For instance, the MEG model cannot capture the effects of

¹⁶ Hall and Jorgenson (1967) introduced inclusion of tax depreciation in cost of capital calculations. The actual tax depreciation calculations used in the MEG model are based on depreciation schedules in present law and in the policy proposal.

¹⁷ JCT (2005a) provides a brief description of these microsimulation models.

¹⁸ According to Congressional Budget Office (2011), in fiscal year 2010 the deficit was \$1.3 trillion — 8.9 percent of GDP. It is predicted to fall to \$551 billion, 3.0 percent of GDP in fiscal year 2015, and then begin growing again in both nominal value and as a percentage of GDP.

possible shifting between firms that are capital-intensive and those that are not capital-intensive, or between sectors that tend to be more internationally oriented and those that are not. Thus, while the simulations described below provide a “big picture” analysis of the results of the growth effects of corporate rate reductions under different financing assumptions, they may understate the positive benefits of corporate tax reform — particularly to the extent that there are economic efficiency gains that result from reducing sectoral or international distortions.

B. Reduce the Corporate Income Tax Rate to 30 Percent

The staff of the JCT estimates that reducing the top U.S. corporate tax rate to 30 percent starting in 2012 would result in a \$478 billion reduction in tax receipts over the 10-year budget window. Over the period 2012–2021, this would be a 12 percent reduction in corporate income tax receipts.¹⁹ Table 2 shows the growth effects of reducing the top statutory corporate rate from 35 to 30 percent without any other changes to corporate taxation. This debt-financed decrease in the corporate income tax rate primarily affects the economy by increasing the after-tax rate of return on corporate capital, and therefore the incentive to invest in this capital. The producers’ capital stock is projected to increase by 0.3 to 0.4 percent in the first five years, and 0.8 to 1.0 percent over 10 years. The build-up of the capital stock leads to an increase in labor productivity, and thus higher wages. These effects lead to an increase in total output, with real GDP projected to increase between 0.1 and 0.2 percent. In the short run, the effect on consumption is smaller than on output in general, as increased returns to investment result in an increase in savings. In the longer run, the accumulated capital stock supports higher employment and consumption, maintaining a 0.2 percent increase in GDP. But increasing interest rates due to increased government borrowing slows the build-up of the capital stock, reducing saving; as a result, the fiscal picture begins to deteriorate.

Comparing model results for the simulations that assume neutral and aggressive monetary policy responses shows that the aggressive monetary policy response dampens the effect of the tax policy changes. This is particularly true in the first five years because the monetary policy response acts to counter the fiscal stimulus that results from decreased tax payments.

C. Reduce the Rate to 30 Percent and Finance with Infra-marginal Tax Expenditures

A popular approach to tax reform is to eliminate deductions, credits, and other tax expenditures in order to broaden the taxable base, and lower statutory tax rates enough to hold revenues constant.²⁰ A large share of corporate tax expenditures appears to have

¹⁹ Congressional Budget Office (2011) estimates that total corporate tax receipts for the period 2012–2021 would be \$3.923 billion.

²⁰ This is the approach taken, for example, by the reform of the individual income tax in 1986. Many of the current calls for corporate tax reform have invoked such a goal.

Macroeconomic Variable	2011–2016	2017–2021	Long Run
Neutral Monetary Policy:			
Real GDP	0.2	0.2	0.2
Total Capital Stock	0.2	0.4	–0.0
Producers' Capital	0.4	1.0	0.7
Residential Capital	–0.1	–0.4	–1.2
Real Consumption	0.0	0.1	0.4
Employment	0.2	0.0	0.1
Corporate Interest Rate (Change in percentage points)	0.2	0.2	0.4
Aggressive Monetary Policy:			
Real GDP	0.1	0.1	0.2
Total Capital Stock	0.1	0.2	–0.2
Producers' Capital	0.3	0.8	0.5
Residential Capital	–0.2	–0.7	–1.3
Real Consumption	–0.1	0.0	0.4
Employment	0.0	0.0	0.1
Corporate Interest Rate (Change in percentage points)	0.1	0.2	0.6

effects on marginal investment incentives, either by directly affecting the effective marginal corporate tax rate or by affecting the cost of capital through changes in depreciation and expensing rules. However, to provide information on the effects of the classic approach, we present the results of simulations in which we assume that the corporate tax rate cut is fully offset, year-by-year, by unspecified provisions that increase corporate revenues without affecting marginal incentives. The results are shown in Table 3.

While overall effects on GDP are very similar between the debt-financed and the base-broadening simulations in the short and medium run, producers' capital increases more under the base broadening simulation — by 0.9 to 1.1 percent in the medium run, and 1.3 to 1.4 percent in the long run, reflecting the lack of government debt crowding out private capital. In the long run, GDP is 0.3 to 0.4 percent — higher than in the debt-financed simulation, while interest rates are significantly lower than in the first simulation.

Table 3

Macroeconomic Effects of Reducing the Corporate Rate to 30 Percent
and Broadening the Corporate Taxable Base
(Percentage Change in Levels Relative to Present Law)

Macroeconomic Variable	2011–2016	2017–2021	Long Run
Neutral Monetary Policy:			
Real GDP	0.2	0.2	0.4
Total Capital Stock	0.2	0.5	0.6
Producers' Capital	0.4	1.1	1.4
Residential Capital	–0.1	–0.4	–0.8
Real Consumption	0.0	–0.0	0.4
Employment	0.2	–0.1	0.1
Corporate Interest Rate (Change in percentage points)	0.2	0.2	0.2
Aggressive Monetary Policy:			
Real GDP	0.1	0.2	0.3
Total Capital Stock	0.1	0.3	0.6
Producers' Capital	0.3	0.9	1.3
Residential Capital	–0.2	–0.6	–0.7
Real Consumption	–0.1	–0.0	0.4
Employment	0.0	0.0	0.1
Corporate Interest Rate (Change in percentage points)	0.1	0.2	0.3

D. Reduce the Corporate Rate to 30 Percent with Partial Repeal of Accelerated Depreciation

As noted in the discussion of corporate tax expenditures above, a simple repeal of existing tax expenditures may not necessarily result in a pure revenue-neutral rate reduction that would improve, or even preserve, existing effective marginal incentives to invest. It seems likely that some of the policies that might be chosen to offset the cost of a rate cut will have marginal effects. To the extent that these policies result in no change in the effective marginal corporate rate (the rate after accounting for the marginal effects of removing deductions or credits on taxable income) relative to current law,

Table 4
 Macroeconomic Effects of Reducing the
 Corporate Rate to 30 Percent and Partial Repeal of MACRS
 (Percentage Change in Levels Relative to Present Law)

Macroeconomic Variable	2011–2016	2017–2021	Long Run
Neutral Monetary Policy:			
Real GDP	0.1	–0.1	0.1
Total Capital Stock	0.0	0.0	–0.3
Producers’ Capital	0.2	0.3	–0.3
Residential Capital	–0.1	–0.3	–0.4
Real Consumption	0.1	–0.0	0.2
Employment	0.2	–0.1	0.0
Corporate Interest Rate (Change in percentage points)	0.1	0.1	0.1
Aggressive Monetary Policy:			
Real GDP	0.0	–0.1	0.1
Total Capital Stock	0.0	–0.1	–0.3
Producers’ Capital	0.1	0.1	–0.3
Residential Capital	–0.2	–0.5	–0.3
Real Consumption	–0.0	–0.0	0.2
Employment	0.0	–0.0	0.0
Corporate Interest Rate (Change in percentage points)	0.1	0.1	0.1

then there is likely to be little overall macroeconomic effect from the change, although the specific implementation could be one that increases efficiency by reducing distortions. Next we consider a revenue offset that would affect marginal incentives, but not directly affect the effective corporate marginal rate — specifically, a partial repeal of the MACRS. Because a full repeal of MACRS would raise more revenue than is needed to pay for the 5 percentage-point rate cut, we assume that the parameters of MACRS are modified so that the system is less generous, and the conventional estimate of revenue raised over the budget horizon (not taking into account macroeconomic effects) exactly matches the conventionally estimated revenue loss from the rate cut during the 10-year

Table 5

Sensitivity Analysis of Macroeconomic Effects of Reducing the Corporate Rate to 30 Percent and Partial Repeal of MACRS Under Different Assumptions about Corporate Finance (Percentage Change in Levels Relative to Present Law)

Macroeconomic Variable	2011–2016	2017–2021	Long Run
Aggressive Monetary Policy, 95 Percent of Firms “Traditional View”			
Real GDP	–0.0	–0.1	0.1
Total Capital Stock	0.0	–0.2	–0.4
Producers’ Capital	0.0	0.0	–0.5
Residential Capital	–0.2	–0.5	–0.4
Real Consumption	0.0	–0.0	0.1
Employment	0.0	–0.0	0.0
Corporate Interest Rate (Change in percentage points)	0.1	0.1	0.1
Aggressive Monetary Policy, 5 Percent of Firms “Traditional View”			
Real GDP	0.0	–0.0	0.1
Total Capital Stock	–0.0	–0.1	–0.2
Producers’ Capital	0.1	0.2	–0.2
Residential Capital	–0.2	–0.5	–0.3
Real Consumption	–0.0	–0.0	0.2
Employment	0.0	–0.0	0.0
Corporate Interest Rate (Change in percentage points)	0.1	0.1	0.1

federal budget period.²¹ The corporate rate reduction with partial repeal of MACRS is not revenue neutral year-by-year. Partial repeal of MACRS raises substantially more revenue in the early years, as the depreciation pattern of new vintages of capital no longer matches the old vintages. But in the steady state when all vintages are equally affected, the revenue effect is smaller. Thus, in the long run, the combination of the two policies results in revenue losses.

²¹ MACRS applies to both corporate and non-corporate business. The partial repeal is assumed to apply across-the-board to both types of businesses. MEG aggregates all types of business entities into one “business” sector. And each type of business capital — producer’s durables, producer’s structures, and multi-family housing — is also treated at an aggregate level, with each having its own depreciation rate adjusted pro-rata for partial repeal of MACRS.

Table 4 shows the effect of combining a 5 percentage-point rate reduction with a revenue-neutral, partial repeal of MACRS. The positive effects of the rate cut on producers' capital are largely offset by the increased cost of capital when MACRS is partially repealed — producers' capital is still increased within the short and medium run, but by 0.1 to 0.3 percent — not by as much as in the other simulations. In the long run, producers' capital stock declines by 0.3 percent. Overall, real GDP is also little changed as a result of the policy, by between -0.01 percent and 0.1 percent, supported by a modest increase in consumption as incentives to save are reduced by the effects of the MACRS change on the cost of capital.

Table 5 shows two additional aggressive monetary policy simulations that vary the percentage of firms that finance new investment out of new equity issuance. Our baseline assumption is that 50 percent of firms finance new investment out of new share issuance (traditional view firms), and 50 percent finance new investment out of retained earnings (new view firms). As mentioned above, the investment decisions made by firms following the new view are not affected by the dividend tax rate. Thus, the corporate rate cut is a larger cut in the overall tax on capital income for new view firms than for firms that follow the traditional view. Therefore we expect that simulations with more firms following the traditional view should result in a smaller capital stock over time. Table 5 shows that if most firms follow the traditional view, cutting the corporate rate to 30 percent combined with a partial repeal of MACRS will reduce GDP and the capital stock more than if the bulk of firms follow the new view.

IV. CONCLUSION

For good reasons, interest in reforming the U.S. corporate income tax has been increasing recently. The U.S. corporate income tax has high statutory rates relative to other OECD countries, and both modest and declining collections. These high statutory rates introduce distortions, and reduce the competitiveness of U.S. corporations. It appears that the corporate income tax is ripe for reform that would broaden the taxable base, thus reducing distortions and allowing for a lower statutory tax rate. However, most of the likely tax expenditure candidates for broadening the base in a substantial way either increase the effective marginal tax rate or increase the user cost of capital.

In this paper, we analyze three different policies: (1) a corporate rate cut of 5 percentage points financed with increased debt; (2) a corporate rate cut of 5 percentage points financed with reductions in hypothetical infra-marginal base broadening tax expenditures; and (3) a corporate rate cut of 5 percentage points financed with a partial repeal of MACRS.

We show that financing a corporate rate reduction with reductions in infra-marginal tax expenditures would dominate each of the other two policies in terms of increasing economic growth. In particular, real GDP under this policy is projected to be between 0.1 and 0.2 percent higher in the long run than it would be under the deficit-financed policy. Long-term productive capacity is significantly larger in the base broadening simulations with the producers' capital stock between 0.7 percent and 1.2 percent higher in the long run. Compared to the third policy simulation, financing the corporate rate cut

with a partial repeal of MACRS, real GDP and the producers' capital stock are higher by 0.2 percent and 1.5 percent respectively. We also explore whether corporate finance assumptions play any role in the results, and find that the more firms finance out of new share issuance, the more steeply the producers' capital declines.

We find that financing a corporate rate reduction with partial repeal of MACRS results in a macroeconomic outlook that is worse by several measures than the current law baseline, with potentially lower consumption, employment, real GDP, and capital stock — particularly in the 2017–2021 period. If corporate reform can be financed with reductions in infra-marginal tax expenditures, then there are real macroeconomic benefits to revenue neutral corporate income tax reform. Thus, in designing a corporate tax reform strategy, it is important to take into consideration whether a tax expenditure targeted for repeal is marginal or infra-marginal. Moreover, if a tax expenditure is targeted for reform and it is currently marginal in nature, then there could be real benefits to designing the repeal in such a way that the marginal incentives remain unchanged but the infra-marginal tax expenditure is repealed. For instance, the Internal Revenue Code: Sec. 41 research credit was designed to be incremental and only give a credit for research above a certain base level, thereby creating marginal incentives while reducing the infra-marginal effects. However, there are potential tax administration issues, as well as potential difficulties for taxpayers in complying with complicated tax regimes.

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