Fossil Fuel Taxation in the President’s 2013 Budget

by

Andre J. Barbe, Ph.D. Candidate
Department of Economics, Rice University
Houston, TX 77251
Phone: 1-504-258-2637 / Fax: 1-713-348-5278 / Email: ajb3@rice.edu

Abstract

The President’s Fiscal Year 2013 Budget would increase taxes on fossil fuel production by increasing tax rates, reinstating expired taxes, and eliminating deductions. These changes are justified on the grounds that the proposals would remove tax preferences that encourage more investment in fossil fuels than would occur under a neutral system. In this paper we identify the ten most important changes proposed and compare them to both current law and a neutral tax system. We find that some of the proposed changes increase the neutrality of the system while others decrease it. We then move to look at the overall tax treatment of fossil fuel production. Surveying past literature on the effective tax rate on capital shows a wide variety of estimated tax rates for the sector. We then calculate our own measures of the effective tax rate for the sector using three different specifications. Under all three of our measures, the effective tax rate for fossil fuel production is higher than the average for other sectors.

I. INTRODUCTION

President Obama’s Fiscal Year 2013 Budget proposes significant changes to the Internal Revenue Code (Code) that would impact the production of fossil fuels. These changes include increasing tax rates, reinstating expired taxes, and eliminating deductions. This paper discusses the ten most important tax changes contained in the proposed budget: (1) increase the Oil Spill Liability Trust Fund financing rate, (2) repeal expensing of intangible drilling costs (IDCs), (3) repeal percentage depletion for fossil fuels, (4) repeal the domestic manufacturing deduction for fossil fuels, (5) increase the geological and geophysical amortization period for independent producers, (6) repeal capital gains treatment for coal royalties, (7) repeal expensing of exploration and development costs for coal, (8) repeal the last-in, first-out (LIFO) method
of accounting for inventories, (9) reinstate the Superfund excise taxes, and (10) modify the tax rules for dual capacity taxpayers.\footnote{These changes were earlier identified as the most important for fossil fuel production by Pirog (2012).}

Revenue estimates of these changes from the Department of the Treasury (2012), hereafter Treasury, and the Joint Committee on Taxation (2012), hereafter JCT, are presented in Table 1. By either measure, the changes listed above will provide over 99 percent of the revenue increases brought about by changes specific to the energy sector.

Table 1: Revenue Estimates of Provisions of President’s 2013 Budget for 2013-22 ($ millions)

<table>
<thead>
<tr>
<th>Provision</th>
<th>JCT(^1) (2012)</th>
<th>Treasury (2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase Oil Spill Liability Trust Fund financing rate</td>
<td>462</td>
<td>717</td>
</tr>
<tr>
<td>Repeal expensing of intangible drilling costs</td>
<td>9,529</td>
<td>13,902</td>
</tr>
<tr>
<td>Repeal percentage depletion for oil and gas</td>
<td>12,099</td>
<td>11,465</td>
</tr>
<tr>
<td>Repeal percentage depletion for coal and other hard mineral fossil fuels</td>
<td>1,310</td>
<td>1,744</td>
</tr>
<tr>
<td>Repeal the domestic manufacturing deduction for fossil fuels(^2)</td>
<td>3,662</td>
<td>0</td>
</tr>
<tr>
<td>Increase geological and geophysical amortization period</td>
<td>957</td>
<td>1,400</td>
</tr>
<tr>
<td>Repeal capital gains treatment of coal royalties</td>
<td>612</td>
<td>422</td>
</tr>
<tr>
<td>Repeal expensing of coal exploration and development</td>
<td>279</td>
<td>440</td>
</tr>
<tr>
<td>Repeal LIFO inventory accounting for all sectors</td>
<td>66,872</td>
<td>73,782</td>
</tr>
<tr>
<td>Reinvest Superfund excise taxes(^3)</td>
<td>6,538</td>
<td>8,225</td>
</tr>
<tr>
<td>Modify tax rules for dual capacity taxpayers</td>
<td>9,571</td>
<td>10,724</td>
</tr>
<tr>
<td>All other fossil fuel specific provisions</td>
<td>141</td>
<td>182</td>
</tr>
</tbody>
</table>

Notes: (1) The JCT revenue estimates are actually for 2012-22. However, for all provisions except the repeal of the capital gains treatment of coal royalties, revenues for 2012 would be 0. For that provision, 2012 revenues are $2 million. (2) This is the revenue estimate for the net effect of both the repealing the production deduction for fossil fuels and increasing it for certain advanced technology. Treasury (2012) estimates the revenue raised from just the repeal at $11,883 million and Office of Management and Budget (2012) estimates the revenue from just repeal at $11,612 million. (3) This is the revenue estimate for all 3 Superfund excise taxes combined. Only one of the three, a tax on petroleum, is relevant to the energy industry. However it accounted for 68% of total Superfund excise tax revenue from 1991-1995 (Ramseur, Reisch, and McCarthy 2008).

We discuss each change proposed by the budget, and compare it to both current law and treatment under a neutral tax system, i.e., one that does not cause firms to change their economic behavior. This discussion is not intended to be a
definitive statement on the neutrality of these provisions but a summary of the basic issues regarding each provision and the neutrality of the provision for the given issues discussed.

We also discuss estimates of the overall level of taxation of fossil fuel production compared to other industries. This issue is important in the context of the energy tax changes the President proposes because even if the tax changes would be distortionary by themselves, they might not be so when considered along with the other existing features of the tax code. For example, supporters of repealing many of these deductions have pointed to evidence that the fossil fuel production faces low tax rates or high subsidies. In this case, repealing certain tax deductions for the industry might be neutrality enhancing because they level the playing field between fossil fuel production and other industries. This section will discuss different methods for calculating the tax rate for fossil fuel production and review past results. In addition, we present new estimates of the average effective tax rate of fossil fuel production.

This paper is organized as follows. Section 2 discusses each change proposed in the budget, and compares it to both current law and a neutral tax system. Section 3 discusses the overall tax treatment of fossil fuel production in comparison to other sectors. Section 4 summarizes and concludes.

II. COMPARISON OF CURRENT LAW, PROPOSED CHANGES, AND NEUTRAL TAX TREATMENT

In this section, we will list the major changes proposed by the President’s 2013 Budget Proposal, describe the current law, discuss what the proposal will and will not change relative to current law, and then compare current law and the changes to how things would be under a neutral tax system. Our definition of neutrality will be based on the principle that the tax system should be neutral between choices such as firm organizational form, technology, and industry so that taxpayers make their decisions on economic and not tax criteria. However, the exact features of a neutral tax system are a subject of disagreement among scholars and are beyond the scope of this paper. When there is no consensus on how a particular feature of the Code would look under a neutral tax system, we will compare present law to each of the options advocated by the literature.

A. Oil Spill Liability Trust Fund

Currently an excise tax of 8 cents per barrel is imposed on crude oil produced in the US and crude oil and petroleum products imported into the US. This tax is scheduled to increase to 9 cents per barrel in 2017 and then expire in 2018. However, the excise tax has been repeatedly extended since its creation in 1990 and is assumed to be permanent for federal budget scorekeeping purposes (JCT 2011). The proceeds from this excise tax are deposited in the Oil Spill Liability Trust Fund (Trust Fund), which is used to pay for various costs resulting from oil spills and their subsequent cleanup and also
government oil spill prevention and response programs (Treasury 2012). The fund pays for claims that are not covered by the responsible party, up to a $1 billion per incident limit and can reimburse the responsible party for some oil spill cleanup costs if the spill was not caused by negligence or violation of Federal regulations.\(^2\) For the purposes of this tax, “crude oil” does not include synthetic petroleum or unconventional crudes. This means that domestically produced shale oil, refined oil, and liquids from coal, tar sands, and biomass, and are not taxed (JCT 2012). Refined oil is taxed if imported because it is included under “petroleum products” but imported tar sands are not (Internal Revenue Service 2011b).

The President’s 2013 Budget proposal increases the excise tax to 9 cents per barrel for 2013-2016 and to 10 cents per barrel for 2017 and onwards (Treasury 2012). The tax would also be extended to apply to crudes that are produced from bituminous deposits and kerogen-rich rock (Treasury 2012).

In the case of smaller oil spills, strict civil liability for the full costs of the oil spill is optimal as it fully internalizes both the cost of the oil spill and the cost of prevention. The main argument for a trust fund is the case of catastrophic oil spills where the damages exceed the ability of the responsible party to pay. Previous literature has advocated two solutions to dealing with catastrophic oil spills: mandatory insurance and a prospective excess liability tax (Viscusi and Zeckhauser 2011; Cohen et al. 2011). Under a prospective excess liability tax, responsible parties would still face full strict liability but a tax would also be imposed and the federal government would pay for any damages that exceed the value of the responsible party’s assets. This tax’s rate would need to be actuarially fair with respect to the probability the activity causes an accident that could not be covered by the responsible party’s assets.

The excise tax to fund the oil spill liability trust fund is much closer to a prospective excess liability tax than mandatory insurance, so that is the comparison we will make to judge the neutrality of the tax. However, the trust fund’s excise tax differs from a neutral prospective excess liability tax in two ways: it does not have an actuarially fair rate and has only limited liability. And the president’s proposal to increase the financing rate and extend it to other forms of oil production would exacerbate the problem.

A neutral tax would have an actuarially fair financing rate. However, there is no evidence the current rate of 8 cents per barrel or the president’s proposed increase to 9 cents per barrel are based on the expected cost to the trust fund per barrel produced. And ideally, the rate would also vary with the level of safety taken by the firm. Although the benefits of a more accurate rate need to be weighed against the difficulty of administrating such a tax, extending the tax to include

\(^2\) Responsible parties are reimbursed for cleanup costs over a fixed amount that depends on the size of the vessel or facility the spill occurred at. However, Woods (2008) notes that the standards used to prove that the responsible party was not negligent can make it difficult for responsible parties to receive this reimbursement.
unconventional deposits would further decrease its accuracy. Extraction of crude from oil sands on land (or in fact, any land
based oil extraction) does not run the risk of the type of a catastrophic oil spill like the Deepwater Horizon.

In addition, it is worth noting that the purpose of the tax is to pay for catastrophic oil spills that exceed the
responsible party’s ability to pay, not smaller oil spills for which the responsible party can pay. Thus a neutral tax rate would
also need to take into account the lower rate of default for large firms with deep pockets by charging them a lower rate for the
same activity. For the Deepwater Horizon oil spill, BP set up a $20 billion fund that had paid $4.7 billion as of July 2011, far
exceeding the fund’s $1 billion cap (Yost 2011). The probability that an oil spill would exceed the roughly $100 billion assets
of a major integrated oil company like BP would be extremely small, and thus an actuarially fair tax rate would be similarly
small (Abraham 2011). This is one of the few places in the Code where different tax treatment of small firms and major
integrated oil companies can be justified.

Liability is limited under current law in two ways. Total payouts by the trust fund are limited to $1 billion per
incident. But with this cap, the trust fund could not fully cover the damages of the deepwater horizon oil spill if BP had
defaulted. The trust fund also limits the liability of responsible parties for oil spill if they were not negligent and did not break
federal regulation. This creates a moral hazard for firms to follow the minimum level of oil spill avoidance required by law,
instead of the socially optimal level ensured by full strict civil liability.

B. Expensing of Intangible Drilling Costs

Intangible drilling costs (IDCs) are expenditures made in preparation of wells for the production of oil, natural gas,
or geothermal energy that are not for the purchase of tangible property. For example, wages and fuel are examples of IDCs
but pipelines are not (Treasury 1984). Most taxpayers may elect to either expense or capitalize these costs. Integrated oil
companies, however, are not allowed to fully expense IDCs but must capitalize 30% of intangible drilling expenses over a
60-month period (JCT 2012).

The President’s 2013 Budget proposal repeals both the expensing and 60-month amortization of IDCs (Treasury
2012). Intangible drilling costs instead would be capitalized as depreciable or depletable property (Treasury 2012).³

Under a neutral income tax system, expenses relating to the creation of a capital asset should not be expensed, but
capitalized, with the tax depreciation allowance equal to the economic depreciation rate of the capital asset produced.
However, it is not clear what generally applicable rules would now apply to IDCs nor what the true rate of economic
depreciation is. It is thus not possible to compare whether the old or new rates are closer to the economic rate of

³ Typically, depreciable assets are used to recover depletable assets (JCT 2012).
depreciation.\(^4\) However, one clear advantage of this change is that it would remove the different tax treatment between firms due to organizational form since it would remove a deduction not available to integrated oil companies.

It is also worth repeating that the expensing of intangible drilling costs is not exclusively for oil and natural gas but also geothermal energy. However, neither JCT (2012) nor Treasury (2012) mention this fact nor discuss if this change would also apply to geothermal IDCs.

### C. Percentage Depletion

Depletion is similar to depreciation. They are both deductions taxpayers receive as an asset is reduced in value as it produces income. For fossil fuels, the cost of acquiring the lease for the property is allowed to be deducted through depletion instead of depreciation (JCT 2012). The Code allows two methods for the calculation of depletion deductions: cost depletion and percentage depletion.\(^5\) Under the cost depletion method, each year the taxpayer deducts an amount equal to the amount of the resource recovered that year times the cost of acquiring the lease divided by the total amount of the resource in the property. Under the percentage depletion method, a constant percentage, varying from five to 22 percent (depending on the type of material extracted) of the taxpayer’s gross income from a producing property is allowed as a deduction from net income in each taxable year (JCT 2012).\(^6\)

Percentage depletion does not depend on the costs of acquiring the property and thus has no direct relationship to cost recovery. GAO (2000) finds over the years 1968-2000 government revenue was decreased by a total of $82 billion in year 2000 dollars because of the greater deductions available to the petroleum industry in percentage depletion compared to cost depletion. In addition, cumulative depletion deductions may be greater than the amount expended by the taxpayer to acquire the property in the first place (JCT 2012).

The President’s 2013 Budget proposal would repeal the percentage depletion deduction (Treasury 2012). All properties and firms would use the cost depletion method instead (Treasury 2012).

In isolation, percentage depletion is non-neutral. The percentages are chosen based on non-economic criteria such as the type of resource being extracted and eligibility varies depending on firm organizational form. Percentage depletion is also not directly linked to the cost of the actual capital invested. If this tax were revised to be neutral, is unclear what the

---

\(^4\) There is no reference in the proposal to what the new rules are or if there even is a single set of rules which would now apply to all IDCs. It appears expenditures that were grouped together under the category of IDC would now have a variety of different treatments based on the type of expenditure they are.

\(^5\) Additional explanation of the two depletion methods is available in IRS (2011a).

\(^6\) Other limitations on percentage depletion exist as well. For example, for non-integrated oil companies, the deduction is limited to domestic U.S. production on the first one thousand barrels per day per well and is also limited to 65\% percent of net income on that particular property. Integrated oil companies are not allowed the percentage depletion deduction at all (Smalling 2012).
optimal deprecation rate would be. But using the rate at which minerals are removed from the property as the deprecation rate (as cost depletion does) would at least ensure that full write off only occurs when all the minerals are removed from the property. So it appears to be a more neutral method than using percentage depletion.

However, including other taxes into the analysis favors the retention of percentage depletion. In 2011, 35 of the 50 states imposed a severance tax on the extraction of natural resources (Telles, O’Sullivan, and Willhide 2012). These taxes are usually imposed at a flat rate per unit of measure (per ton of coal, per barrel of oil, etc.) (Zelio and Houlihan 2008). In addition, as part of the lease allowing companies to extract minerals from federal land, the federal government charges royalties which in 2006 were 12 ½ to 16 ⅔ percent of the value of oil and gas extracted and $0.15 to $1.75 per ton extracted for coal (Minerals Management Service Minerals Revenue Management 2006). However, such taxes or lease terms are distortionary because they reduce the marginal revenue of additional extraction compared to its marginal cost, causing early shutdown of otherwise still productive property. A percentage depletion allowance less than or equal to the severance tax or royalty rate would be efficiency enhancing by effectively canceling out part of the severance tax or royalty and thus increasing production.7

D. Domestic Manufacturing Deduction

The domestic manufacturing deduction was added to the Code with the American Jobs Creation Act of 2004 in order to encourage domestic investment and improve the competitiveness of US manufacturers in global markets (Blouin, Krull, and Schwab 2007). It allows a taxpayer to deduct a percentage of their income derived from domestic manufacturing activities (Pirog 2012). The percentage of the deduction is six percent for oil and gas and is otherwise nine percent.

The President’s 2013 Budget proposal would repeal the domestic manufacturing deduction for income derived from the domestic production of oil, gas, coal, other hard mineral fossil fuels, and certain other nonmanufacturing activities (Treasury 2012). The deduction rate would also be increased to 18 percent for activities involving the manufacture of certain advanced technology property (Treasury 2012).8 The domestic manufacturing deduction would remain for other industries.

Increasing the difference in the domestic manufacturing deduction between industries, which is already at a lower rate for oil and gas production, reduces the neutrality of the Code even further. It distorts the flow of capital towards sectors with a higher rate such as manufacturing and especially advanced manufacturing and away from sectors with a lower rate

---

7 Although using percentage depletion to cancel out royalties would mean the original purpose of the depletion deduction, recovering capital costs incurred in acquiring the property, would not be served.
8 The proposal is quite vague on some of these terms. It does not define what the “certain other nonmanufacturing activities” that would lose the deduction are nor does it define what the “activities involving the manufacture of certain advanced technology property” are.
such as oil, gas, and coal production. And since this distortion also happens to reduce the favorability of domestic oil, coal, and gas production, it would reduce also US energy security. This paper will not attempt to weigh the merits of energy security vis-à-vis free trade. However, current US policy does show that the government places a value on energy security through funding of initiatives such as the Strategic Petroleum Reserve. Unless the government places the same value on domestic production as opposed to importation of the targeted manufacturing sectors, this would be an additional efficiency loss of the tax change.

E. Geological and Geophysical Amortization Period

Geological and geophysical (G&G) expenses are the costs incurred for acquiring data for minerals exploration and include expenditures on geologists, seismic surveys, gravity meter surveys, and magnetic surveys (JCT 2012). Independent producers and small integrated oil companies may amortize these costs over two years. Major integrated oil companies are required to amortize G&G costs over seven years.

The President’s 2013 Budget proposal would increase the amortization period for independent producers and small integrated oil companies from two years to the same seven years as major integrated oil companies (Treasury 2012). Major integrated oil companies would be unaffected.

Under a neutral tax system, statutory G&G depreciation would equal economic depreciation and be the same for all firms regardless of organizational form. So it is appropriate that the President’s proposal is to treat independent producers, small integrated oil companies, and large integrated oil companies equally. BEA (2003) calculates the geometric economic depreciation rate for petroleum and natural gas mining exploration, shafts, and wells at .0751 and lists a service life of 12 years. So the increase in the amortization period for independent producers and small integrated oil companies would move their tax depreciation treatment closer to both economic depreciation and eliminate the difference in tax treatment due to firm organizational form. This change is thus neutrality enhancing.

F. Capital Gains Treatment of Royalties

While in general royalties are taxed as ordinary income under the code, royalty income from the sale of coal mined in the US and held for at least one year can be taxed instead as long term capital gains (JCT 2012). The President’s 2013 Budget proposal would repeal the capital gain treatment of gains from coal royalties under this circumstance (Treasury 2012).

---

A summary of the BEA depreciation table as it is relevant to the energy industry is available in Table A1 in the Appendix of Metcalf (2009).
There are a variety of considerations that must be taken in dealing with the taxation of ordinary income versus capital gains in a neutral tax system to ensure that income invested and then earned again in a subsequent period is not double taxed. However, in this case these concerns can be safely sidestepped by focusing on the coal itself. Coal and coal royalties are not assets like property or stocks but inventories. Income from the sale of inventories is typically treated as ordinary income, not capital gains. This provision is thus neutrality enhancing. However, the budget proposal does still deviate somewhat from a neutral system, which would allow inflationary gains to be deducted from income. This point is explained in detail later in this paper under the discussion of LIFO.

G. Expensing of Coal Exploration

Exploration is the process of determining if there are sufficient minerals in an area to justify mining. Under current law, taxpayers may elect to expense these costs in all types of mining, not just coal. Unlike other organizational forms of firms, corporations may only expense 70 percent of the exploration expenses and must capitalize and amortize over a 60-month period the remaining 30 percent (Treasury 2012). This deduction is subject to recapture by disallowing percentage depletion deduction on the property for which exploration costs were expensed until “adjusted exploration expenditures” are re-included in income (JCT 2012).  

The President’s 2013 Budget proposal would repeal the option to expense and amortize over 60-months mining exploration and development costs for coal (including lignite) and certain oil shale (Treasury 2012). The costs would instead be capitalized and recovered through depreciation or depletion deductions, as appropriate (Treasury 2012). Other forms of mining would retain the option to expense and amortize exploration costs.

A taxpayer should be allowed to capitalize costs that benefit future periods based on the economic rate of depreciation. Exploration costs for a mine that is found to not have sufficient quantity or quality of ore to justify mining should be immediately expensed since they will provide no future benefit. However, for a productive mine, they should be deducted at their economic depreciation rate. As was stated before, BEA (2003) calculates the geometric economic depreciation rate for petroleum and natural gas mining exploration, shafts, and wells at .0751 and a service life of 12 years, a longer lifetime than the 60-month amortization allowed now. Retaining the deduction for other forms of mining would make the tax system less neutral in regards to which type of mining to invest in but would make the system more neutral for the choice of what type of capital to employ in coal mining.

10 Adjusted exploration expenditures are the amounts for which the taxpayer claimed an exploration deduction that would have been included in the basis of the property reduced by the excess of the percentage depletion over the depletion allowable had the expenses been capitalized instead (JCT 2012).
In general, taxpayers are allowed a deduction for the cost of acquiring the goods they sell. However, the appropriate value to deduct becomes unclear when the firm is selling goods from an inventory containing goods from multiple time periods, each of which was acquired at a different price. The LIFO and FIFO methods determine which price to use in this situation. Under last-in, first-out (LIFO), when a unit of a good is removed from inventory, the price of the last (most recent) unit of that good put into the inventory is used to calculate net income from the sale of the good. Under first-in, first-out (FIFO), when a unit of a good is removed from inventory, the price of the first (least recent) unit of the good put in inventory is used to calculate net income from the sale of the good. In order to use LIFO for tax purposes, a firm must also use LIFO for financial accounting purposes (Treasury 2012). Although LIFO accounting is not unique to firms that produce fossil fuels, some sources indicate repeal of LIFO will have a disproportionately large impact on the sector.\footnote{The evidence on how much repealing LIFO would affect the energy sector is mixed. Przybyla (2011) and Knittel (2009) find that the energy industry has large LIFO reserves but have limited data sets. Table 1 of volume 2 of Treasury (1984) indicates the opposite but is much older.}

When the price of an inventory item increases, such as due to inflation, cost of goods sold is higher under LIFO than FIFO. A higher cost of goods sold in a period translates to lower net taxable income and thus lower taxes paid in that period. The lower cost of goods sold from the less recent period is not used until inventories are drawn down. But if inventories are never drawn down, this lower cost of good sold is never used and those inventory items’ appreciation, whether inflationary or not, is never taxed.

The President’s 2013 Budget proposal would repeal the LIFO inventory accounting method for income tax purposes, regardless of the use of LIFO on the firm’s financial statement (Treasury 2012). Taxpayers that currently use LIFO would be required to write up their beginning LIFO inventory to its FIFO value in the first taxable year beginning in 2013 (Treasury 2012). The resulting increase in income is taken into account ratably over 10 taxable years beginning with the first taxable year beginning in 2013 (Treasury 2012).

In a neutral tax system, taxes should be imposed on real economic income, not increases that are attributable to inflation. Gains from inflation should not be taxed, but neither should an incentive be created to retain inventories. And inventory appreciation that is not due to inflation should be taxed. Treasury (1984) recommends satisfying these goals through firm election between FIFO indexed for inflation or LIFO. However, as previously noted, LIFO allows firms to defer taxes on the gains from their inventory appreciating by maintaining their inventory stock. So we recommend inflation
indexed FIFO as the ideal method. Without indexing, it is unclear if the FIFO requirement proposed by the president would be more or less neutral than the current system.

I. Reinstate Superfund Excise Taxes

The Environmental Protection Agency maintains a list of polluted sites called the National Priorities List. For 70 percent of the sites on the list, the EPA can locate potentially responsible parties (PRPs) who pay for the site’s cleanup (Ramseur, Reisch, and McCarthy 2008). For the remaining 30 percent of sites, either the EPA cannot locate the PRP or the PRP cannot afford to pay for the cleanup (Ramseur, Reisch, and McCarthy 2008). Cleanup at these “orphaned” sites are paid out of the Hazardous Substance Superfund Trust Fund (Superfund). Since the expiration of three excise and one income tax which originally funded the Superfund, the Superfund is now paid for out of general revenues (Ramseur, Reisch, and McCarthy 2008).

The President’s 2013 Budget proposal would reinstate all four Superfund taxes for the years 2013 through 2022 (Treasury 2012). Two of the excise taxes would not apply to the energy industry while the income tax would apply to all corporations. The only tax of specific relevance to the energy industry is the remaining excise tax, a 9.7 cent per barrel excise tax on domestic crude and on imported petroleum products.

Under a neutral tax system, polluted site cleanup would be handled in the same manner as oil spills. We therefore propose the same solutions discussed in greater detail under the Oil Spill Liability Trust Fund. Impose full civil liability for small amounts of pollution and either require firms to purchase excess liability insurance or impose an actuarially fair tax on activities with the possibility for catastrophic pollution that would exceed the firm’s ability to pay.

The Superfund excise tax has a similar problem to the Oil Spill Liability Trust Fund. The excise tax is not actuarially fair: it is paid by all firms who produce or import petroleum, at the same rate regardless of the care taken by any firm to avoid polluting or the firm’s risk of defaulting on cleanup costs. This creates a moral hazard for small firms with a high risk of default and does not internalize the cost of the pollution cleanup.

However, the Superfund is less problematic in that the excise tax is only used to pay for orphaned sites. If the PRP can be identified and is able to pay, then the PRP pays for cleanup at the site. Yet for the orphaned sites, it does not internalize the cost of cleanup if a firm can avoid responsibility if its assets are less than the cost of the pollution damages. But the case of orphaned sites whose PRP cannot be identified complicate the analysis. It is not clear why the PRP cannot be

---

12 Kleinbard, Plesko, and Goodman (2006) note that inflation affects all capital investment, not just inventories, and thus should be dealt with in a systematic manner instead of through LIFO as a piecemeal solution affecting only inventories would favor investment in one form over another. However, a neutral tax system would allow inflation indexation for both.
identified in these cases. If the inability to identify the PRP would also prevent identification of their insurance, then an actuarially fair tax would be more neutral than requiring excess liability insurance.

J. Modify Dual Capacity Rules

The US taxes domestic corporations on the income they earn in foreign countries. However, since the host country can also impose income taxes on the income of corporations earned in that country, this can lead to double taxation of the income of US corporations earned in foreign countries. To avoid double taxation, the Code allows firms to credit certain foreign levies against their US tax liability. A foreign levy is creditable against the firm’s US tax liability if it is compulsory and is not compensation by the firm to the host nation for a specific economic benefit. A “dual-capacity taxpayer” is a taxpayer who is subject to a foreign levy by a country and also receives a specific economic benefit from that country.14

The Code allows taxpayers to choose between two methods to determine the portion of the levy paid by the taxpayer which is compulsory and creditable and the portion which is compensation for a specific economic benefit and deductible.15

Under the facts and circumstances method, a levy is creditable to the extent that the taxpayer is able to prove that portion of the levy is not paid as compensation for specific economic benefits. Under the safe harbor method, if the host country has a generally imposed income tax, the taxpayer may credit an amount equal to the tax payment that would result from application of the host country’s generally imposed income tax (JCT 2012). In either case, the foreign tax credit is limited to a taxpayer’s US tax liability on its foreign source income (JCT 2012).18

The President’s 2013 Budget Proposal would replace the current safe harbor and facts and circumstances methods for determining the fraction of a levy that is creditable (Treasury 2012). Under the new rules, dual capacity taxpayers would be able to treat as creditable the portion of a foreign levy that does not exceed the foreign levy that the taxpayer would pay if it were not a dual-capacity taxpayer (Treasury 2012). In effect, dual capacity companies would only be able to credit an amount equal to the host nation’s general corporate tax rate applicable to other industries (Pirog 2012). This is similar to simply forcing firms to choose the safe harbor method. In addition, the special limit for oil and gas income tax credits would be removed and it would instead be treated as its own separate limitation category (Treasury 2012).

---

15 Treasury Regulation section 1.901-2A(c).
16 These rules were designed because of concerns that income taxes imposed on US oil companies by foreign governments were not legitimate income taxes but disguised royalties, which are normally deductible but not creditable (JCT 2012).
17 Treasury Regulation section 1.901-2A(c)(2)(i).
18 JCT (2012) explains how two additional rules also apply. The credit is restricted by the category of income, generally referred to as “separate limitation category,” so that tax credits from a particular category of income can only offset tax liabilities from that same category of income. In addition to the special limitation categories, credits from oil and gas income taxes may only offset oil and gas income tax liabilities.
If US dual capacity firms outside the US are able to use creditable royalty payments to reduce their tax rate below that faced by US based non-dual capacity firms operating outside the US, who have to pay for economic benefits through deductible but not credible expenses, then removing these credits the playing field and enhances of the tax code. However, it is unclear that simply forcing firms to credit taxes using the general corporate tax rate separates the taxes are true income taxes from the taxes that are payments for economic benefits more accurately than the nuanced calculation allowed by facts and circumstance current rules. Indeed, to the extent that it is accurately applied, the facts and circumstances method seems ideal.

Distinct from possible differentials between sectors, another issue is finding the neutral tax rate for foreign source income of US based dual capacity taxpayers that should apply to all sectors. Under a pure residence base tax system, countries tax their residents (and domestic firms) on their worldwide income. Alternatively, under a territorial tax or source-based tax system, a country only taxes income that is earned within its borders.

Previous literature has not come to a consensus on which system is superior. However, Gravelle (2009) notes that that despite nominally being a residence based tax system, firms only pay taxes on repatriated income and are allowed to indefinitely defer repatriation. This significantly reduces the US tax they pay on foreign source income. In this case, Gravelle (2009) states that a move towards either a more pure residence or territorial tax system would enhance the neutrality of the code. Exempting foreign source income entirely and moving to a territorial tax system would encourage the repatriation of income. Alternatively, the Code could move to a more effective residence system by ending deferral, which would also encourage the repatriation of income.

The President’s proposed changes actually do neither of these and in fact are close to the opposite of the territorial solution. Reducing the credits available on repatriated income would increase the incentive to defer repatriation of foreign source income. This would decrease the neutrality of the Code.

III. OVERALL TAX TREATMENT OF FOSSIL FUEL PRODUCTION

It is important to frame the discussion of the individual tax changes proposed by the President in the context of the existing taxes and deductions faced by fossil fuel producers. The President himself noted that “these companies pay a lower tax rate than most other companies on their investments, partly because we’re giving them billions in tax giveaways every year” (Office of the Press Secretary 2012). Although he did not give a source, there has been significant research in recent years on the tax rates faced by the energy sector, some of which does support his claim.

---

However, before we can discuss previous estimates of effective tax rates, we first need to discuss exactly which taxes we are interested in and how we plan to measure them. Which taxes to include depends on the inference to be drawn. For example, in order to calculate the effective long run tax rate on oil industry capital, severance taxes should not be included since they are borne by landowners in the form of lower resource payments (bonus bid, royalties, etc.). But a severance tax on oil could still be non-neutral, it’s just the distortion would occur on different margins. Lowering the payments resource owners receive could lower overall level of oil production from the pre-tax amount by encouraging alternate land use or early shutdown of the well. Therefore, since we are interested in total production, it is appropriate to look at all taxes. We will do so by calculating the average effective tax rate for fossil fuel production.

Although we are looking at the actual average effective tax rates, a separate issue is determining what the optimal tax rates are. For example, higher tax rates on fossil fuel production than other sectors could be justified as Pigouvian taxation on negative externalities or in order to capture resource rents. The aforementioned severance tax could be efficiency enhancing if it was set equal to the cost of remediation per barrel. However, since there is still uncertainty on what actual tax rates are, we feel it is appropriate to focus on that issue and leave the determination of what the optimal rate is to future work.

A. Types of Taxes on Fossil Fuel Production

1. Capital Taxes

The main taxes imposed on capital income are state and federal corporate income taxes and personal income taxes on capital gains and dividends. The effect of these taxes on the pre-tax and post-tax rates of return is summarized through the effective tax rate (ETR) on investment. The effective tax rate is the amount capital taxes reduce the pre-tax rate of return on investment. For example, if investment in a new oil well earned a pre-tax 10 percent return but taxes reduce that return to 6 percent, the effective tax rate would be (10-6)/10 = 40 percent. An effective tax rate differs from the statutory tax rate in that it applies to the income earned over the lifetime of an investment and is able to account for the effect such as inflation, the difference between tax and economic depreciation, and the difference in the taxation of returns to debt and equity.

The marginal effective tax rate (METR) is the tax rate for the marginal investment, the one that just breaks even. The marginal investment is the critical one for determining the aggregate level of investment because a firm will invest in all investments opportunities with higher post tax rates of return than the break even rate and not invest in any with lower. Reducing the rate of return of an investment which is currently at the break even rate would cause the firm to no longer undertake the project and thus reduce aggregate investment.
We have several estimates of the marginal tax rate for different types of capital assets from previous work by Congressional Budget Office (CBO) (2005), Ernst & Young (2007), and Metcalf (2009). CBO (2005) calculates ETR from federal taxes for a wide variety of very broad asset categories.\(^{20}\) Their results are summarized in Table 2. They find the overall METR on capital assets from all businesses is 24.2 percent and the METR on corporations is 26.3 percent. The METRs for C corporation assets in the fossil fuel industry vary from 9.2 to 24.9 percent.

Table 2: CBO (2005) Estimates of Marginal Effective Tax Rates for Different Types of Capital

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>METR (%)</th>
<th>Share of Corporate Assets (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall businesses</td>
<td>24.2</td>
<td></td>
</tr>
<tr>
<td>Overall corporations</td>
<td>26.3</td>
<td></td>
</tr>
<tr>
<td>Capital income of C corporations, by asset type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric structures</td>
<td>18.6</td>
<td>5.4</td>
</tr>
<tr>
<td>Petroleum and natural gas structures</td>
<td>9.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Electric transmission and distribution</td>
<td>24.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Other power structures</td>
<td>19.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Mining structures</td>
<td>9.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Mining and oil field machinery</td>
<td>21.9</td>
<td>0.2</td>
</tr>
<tr>
<td>Other electrical equipment</td>
<td>24.8</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Ernst & Young (2007) looks at the energy sector specifically but only included the federal corporate income tax in their calculation. They find a 21.6 percent METR for petroleum refining. Metcalf (2009) provides another calculation of the METR of assets used in fossil fuel production. Metcalf’s calculation includes some tax credits, but the only taxes included are the federal corporate income tax and the average state corporate income tax. His results show significant variety in the METR faced by different capital assets, with METRs ranging from a high of 27.0 percent for other natural gas pipelines to a low of -13.5 percent for oil drilling by non-integrated firms. However, his METRs for oil drilling by integrated firms, petroleum refining, and natural gas gathering pipelines are all in the range of 15.2 to 19.1 percent.

2. Other Taxes

In addition to capital taxes, fossil fuel production faces a large number of other taxes such as general sales, property, severance, and excise taxes. As seen in Table 3, total payments for these taxes, less subsidies, by fossil fuel producing sectors

---

\(^{20}\) The taxes included in the CBO analysis are federal taxes on corporate profits, dividends, long-term capital gains, short-term capital gains, interest income, mortgage interest deductions, unincorporated business income, and distributions from nonqualified annuities. See CBO (2005) Table A-4 for more details.
exceed payments for corporate income taxes. However, I can not locate any previous literature that combines and summarizes the effect of these taxes, either with each other or with capital taxes, the way the METR literature has done for taxes on capital investment. In the next section, we attempt to do so for the combined effect of capital and other taxes by calculating average effective tax rates.

Table 3: Total Tax Payments by Industry, 1998-2009 ($ million)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Corporate Income Taxes</th>
<th>Other Production Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and gas extraction</td>
<td>39,230</td>
<td>204,759</td>
</tr>
<tr>
<td>Petroleum and coal products manufacturing</td>
<td>193,870</td>
<td>24,738</td>
</tr>
<tr>
<td>Pipeline transportation</td>
<td>3,738</td>
<td>17,595</td>
</tr>
<tr>
<td>All these particular energy sectors</td>
<td>236,838</td>
<td>247,091</td>
</tr>
<tr>
<td>All sectors</td>
<td>3,627,248</td>
<td>9,785,265</td>
</tr>
</tbody>
</table>

Source: Author’s calculation from BEA US Input-Output Accounts and NIPA Table 6.18D.

B. Average ETR

We are interested in calculating the ETR on fossil fuel production but there is no single ETR that captures every dimension of taxation. Therefore we will provide a number of ETR looking at different types of taxation and different bases. Our two main data sources are the Use of Commodities by Industries after Redefinitions tables for 1998-2009 in the US Input-Output accounts from the Bureau of Economic Analysis (BEA) and Table 6.18D: Taxes on Corporate Income by Industry in the 2012 National Income and Product Accounts, also by the BEA. We will calculate the average effective tax rate for a selection of energy sectors and the whole economy by dividing total tax payments by both gross value added and total output. We also calculate the average effective tax rate on capital for those same sectors by dividing corporate income tax payments by gross operating surplus.

Total tax payment equals taxes on production and imports plus state, local, and federal corporate income taxes minus subsidies. Taxes on production and imports include taxes on the product delivery or sale of products and taxes on the ownership of assets used in production, such as federal excise, state and local sales taxes, and local real estate taxes.

---

21 Both corporate income taxes and the other production taxes include the taxes at the federal, state, and local levels.
22 In an alternative specification, we instead use corporate income tax data from the Internal Revenue Service Statistics of Income Tax Stats on the Returns of Active Corporations by Minor Industry. These results show a smaller difference between all industries and the selected fossil fuel producers, but still with a lower rate for all industries than fossil fuels. However, this data set does not include state and local income taxes and has one less year of data. Full results are available upon request.
Corporate income taxes include those taxes at the federal, state, and local level. Gross value added is equal to gross operating surplus plus compensation of employees, plus taxes on production and imports, less subsidies.

We estimate tax burden using average effective tax rates (AETR) as opposed to marginal effective tax rates (METR). Collins and Shackelford (1995) and Fullerton (1983) discuss each measure and their advantages and disadvantages. METR calculations are designed to measure the tax cost on marginal incentives to hire labor or employ capital. However they are calculated theoretically and require numerous assumptions about firm financing, asset purchase decisions, and depreciation (Collins and Shackelford 1995). In addition, the calculation must explicitly choose which provisions of the tax code (which deductions, which tax credits) to include and how to model them. As a practical matter, they must pick and choose what provisions to include and this will lead the calculation to miss the cumulative effect of numerous small or difficult to model features that are not included.

AETRs are calculating empirically by dividing a measurement of taxes paid by a measurement of the base of economy activity taxed. Because it is calculated from data, it avoids the problems METR calculations face with having to make numerous assumptions and the being forced to pick and choose the features of the tax code to include. However, it measures the average tax rates on all investments as opposed to finding the tax rate on the marginal investment. It thus reflects the total burden of taxation instead of marginal incentives (Collins and Shackelford 1995).

We combine all taxes together for the total tax calculation because, in the long run, all taxes will have certain effects no matter what the statutory base is. Due to capital mobility, a high (or low) tax rate on capital in a sector will not change the long run post-tax rate of return that capital employed in that sector receives. A similar argument applies for labor mobility to show that it is not borne by labor. And production taxes are the same too; in the long run, all these taxes will leave the sector with the same post-tax rate of return to capital and labor. But they will change the resource rent landowners receive, or the price consumers pay, or the total amount of domestic production, depending on the elasticities of each. Therefore adding all taxes together is appropriate for looking at these effects.

Deciding on the base is another critical component for calculating the AETR. To calculate the AETR on capital, we divide corporate income tax payments by gross operating surplus. But since previous work has focused almost exclusively on the average (or marginal) effective tax rate on capital, it is unclear which base is the most appropriate to use for the denominator of our total AETR calculation.

24 See CBO (2006) for a more detailed description of the general method used to calculate METRs.
25 However, AETR is not without its drawbacks. See Fullerton (1983) for a discussion of the problems of AETR.
Total output would be a useful base for looking at the percentage increase in costs due to taxes because dividing total taxes by total output gives the increase in output price over the price of inputs due to taxation. However, taxes in other sectors can also increase the cost of fossil fuel production due to tax cascading. The taxes imposed on other sectors increase the price of their output which is in turn used as intermediate goods in fossil fuel production. Thus the taxes directly paid by a sector are only a portion of the increase in their costs due to the tax system. To check how sensitive our results are to this issue, we also look at total taxes paid with value added as the base. A value added base does not include the cost of intermediate inputs and thus this measure would not be affected by cascading. We present results using both value added and total output in the denominator.

C. Results

Table 4 presents average effective tax rates on capital for energy and other sectors for 1998-2009. The average effective tax rate on capital in these fossil fuel producing sectors is 13.0 percent. This tax rate is 5.5 percentage points or 73 percent higher than the rate of 7.5 percent for all sectors. These results are driven by the extremely high tax rate on capital in petroleum and coal products manufacturing which is 21.4 percent. The other two sectors, oil and gas extraction and pipeline transportation have lower AETR than the average for all sectors.

Table 5 presents average effective tax rates of all firm taxes for energy and other sectors for 1998-2009. As a fraction of value added, the average effective tax rate for the entire economy is 10.9 percent. The average rate for fossil fuel producing sectors is 19.7 percent, a difference of 8.8 percentage points and 81 percent higher than the economy wide rate. If total taxes paid are instead divided by the total value of output, the average effective tax rate for these fossil fuel producing sectors is now 7.4 percent. The AETR for all sectors is 1.5 percentage points lower at 5.9 percent. The AETR for oil and gas extraction is now the highest at 12.1 percent. Petroleum and coal products manufacturing now has the lowest AETR at 5.1 percent.
Table 5: Average Effective Tax Rates of All Taxes by Sector, 1998-2009 (Percent)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Value Added Base</th>
<th>Total Output Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and gas extraction</td>
<td>19.3</td>
<td>12.1</td>
</tr>
<tr>
<td>Petroleum and coal products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturing</td>
<td>20.4</td>
<td>5.1</td>
</tr>
<tr>
<td>Pipeline transportation</td>
<td>16.7</td>
<td>7.4</td>
</tr>
<tr>
<td>All these particular energy sectors</td>
<td>19.7</td>
<td>7.4</td>
</tr>
<tr>
<td>All sectors</td>
<td>10.9</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Source: Author’s calculation from BEA US Input-Output Accounts and NIPA Table 6.18D.

IV. CONCLUSIONS

The proposals in the President’s Fiscal Year 2013 budget to increase the Oil Spill Liability Trust Fund excise tax rate, target the domestic manufacturing deduction, modify the dual capacity rules, and reinstate the Superfund excise taxes reduce the neutrality of the code. The proposals to repeal the capital gains treatment of coal royalties and increase the G&G amortization period are neutrality enhancing. The neutrality of repealing LIFO, percentage depletion, and the expensing of IDCs and coal exploration is unclear.

Although some of the individual tax provisions identified for repeal in the President’s 2013 Budget favor fossil fuel production, it is not clear that the tax code as a whole does. Previous studies calculating marginal effective tax rates on capital employed in fossil fuel production have had mixed results. Our calculations show the average effective tax rate on capital used in fossil fuel production is 2.9 percentage points higher than the economy wide rate. However these taxes are only a minority of taxes paid by the industry. Calculating average effective tax rates for all taxes on fossil fuel production gives a tax rate that is either 8.8 or 1.5 percentage higher than the economy wide rate, depending on the basis used.

REFERENCES


