TAX REFORM: ITS EFFECT ON THE COAL INDUSTRY

Staff Working Paper
May 1986

The Congress of the United States
Congressional Budget Office

This study was prepared by Robert Lucke, formerly of the Tax Analysis Division, under the supervision of Rosemary Marcuss, Assistant Director, and Eric Toder, Deputy Assistant Director. The paper was typed by Linda Brockman. Questions regarding this analysis may be addressed to Eric Toder (226-2683).

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SUMMARY

This study examines the effects of several tax reform proposals on the coal industry. It calculates the effects of the business taxation provisions of the President's tax reform plan and the tax reform bill enacted by the House of Representatives (H.R. 3838) on the cost of capital in coal mining.

Under current law, capital investments in coal mining benefit from a number of tax incentives. These incentives include percentage depletion, expensing of 80 percent of exploration and development costs, the investment tax credit for machinery and equipment, the Accelerated Cost Recovery System (ACRS) for equipment and structures, and capital gains treatment of royalty income.

These tax reform proposals would lower tax rates, but would eliminate or scale back tax incentives. Both proposals would eliminate the investment tax credit, replace ACRS with a new depreciation system with more extended lives, eliminate capital gains provisions for coal royalties, and impose a new alternative minimum tax on corporations with extensive use of tax preferences. The President's plan would phase out percentage depletion over a five-year period, but would retain current law deductions for exploration and development costs. H.R. 3838 would retain percentage depletion, but would lower the rate for coal from 10 percent to 5 percent, and would provide for recapture of expensed development costs. The corporate tax rate would be reduced from 46 percent to 33 percent under the President's plan and 36 percent under H.R. 3838. The President's plan would allow a 10 percent deduction for corporate dividends paid; H.R. 3838 would allow the same deduction, but would phase it in over 10 years.

Both proposals would increase the effective tax rate on corporate equity investments in coal mining. This tax rate would become virtually the same as the tax rate on investments in other industries, thereby eliminating a relative advantage for capital investment in coal mining that exists under current law. (Tax rates for coal and other industries would be higher under H.R. 3838 than under the President's plan.) In the long run, this equalizing of effective tax rates would raise the overall productivity of the capital stock, but coal mining could experience some short-run dislocations.

The provisions in the tax reform proposals that directly affect coal producers would, in themselves, raise costs of capital in coal production. The associated increases in the price of coal would be at most 1.5 percent under the President's plan and 4.7 percent under H.R. 3838. These direct effects may be offset by indirect effects of tax reform, such as lower interest rates or lower costs of capital in coal-using industries (public utilities, for example). The overall impact on production and employment in the coal industry is, therefore, very uncertain.

The coal mining industry would be significantly affected by the current tax reform proposals being considered by the Congress. Both the President's tax proposals (outlined in The President's Tax Proposals to the Congress for Fairness, Growth, and Simplicity, May 1985) and the tax bill (H.R. 3838) passed by the House of Representatives would alter several provisions that have long been criticized as providing an unwarranted subsidy to particular types of investment. These proposals could raise the coal industry's cost of capital, which may make it more difficult for the industry to attract additional financial capital, thereby limiting its growth compared with other sectors. By making the tax system more neutral, however, these proposals could result in overall efficiency gains to the economy by directing investment toward the most productive uses instead of those with the largest tax benefits.

CURRENT TAX TREATMENT OF COAL MINING OPERATIONS

A coal mining operation involves the expenditure of several types of "capital" costs that are each treated differently under the current tax code. Capital costs are any investment costs that are paid up front in order to produce or construct an asset that yields income in future periods. Four types of capital costs pertain here:

- Depletable costs. Associated with the acquisition of land and the mineral rights to coal properties, these costs may consist of either the outright purchase of land or rights or the acquisition of a leasehold that involves the payment of an up-front bonus.1/

- Exploration costs. These costs are related to ascertaining the existence, location, extent, or quality of any coal deposit prior to the development stage of a mine.2/

- Development costs. These costs are for the development of a mine after commercially marketable quantities have been disclosed. They include expenditures for all materials, labor, and energy used, for example, in excavating and constructing mine shafts.

- Depreciable costs. These costs include expenditures for equipment and machinery, such as drills, steam shovels,

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1. Internal Revenue Code section 611. Land acquisition sometimes involves payment of an up-front bonus, as well as future royalty payments. This bonus is included in the depletable base, while the royalty payments are deducted as incurred.

2. Internal Revenue Code section 617.

trucks, and mining machinery, that can be readily used for other purposes. Expenditures for real property improvements, such as buildings to house equipment or trucks, are also referred to as depreciable costs.

Operating expenses related to mining coal are deductible as ordinary business expenses.

Under current law, coal producers are allowed to recover depletable costs by deducting either percentage depletion (I.R.C. section 613) or cost depletion (I.R.C. section 611); to recover exploration costs through expensing with "recapture" of costs once a mine has been brought into production (I.R.C. section 617); to recover development costs through expensing with no recapture (I.R.C. section 616); and to recover depreciable costs through the Accelerated Cost Recovery System (ACRS, I.R.C. section 168). These concepts are explained below.

Depletable Costs

Taxpayers are required to deduct the greater of percentage depletion or cost depletion. Percentage depletion allows coal producers to deduct 10 percent of their gross revenue (from coal mining) from their income for tax purposes. The deduction for percentage depletion is limited to 50 percent of a taxpayer's taxable income, calculated on a property-by-property basis.3/ Cost depletion is computed as the product of original depletable costs and the percentage of estimated coal reserves produced in a given year. For example, if original depletable costs are $10,000, and 5 percent of a mine's coal reserves is produced in a given year, that year's cost depletion deduction would be $500.

Percentage depletion is computed without regard to the actual expenditures for the acquisition of mineral rights; thus, the sum of depletion deductions over the life of the mine may exceed the taxpayer's original cost of the property. Furthermore, the present value of depletion deductions may even exceed the original cost of the property. As a result, percentage depletion may offer a more generous deduction for depletable costs than if those costs were directly expensed.

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3. In the current tax system that allows accelerated depreciation and expensing of development costs, the 50 percent taxable income limitation is likely to be an effective constraint on the percentage depletion deduction in the early years of a mine's life.

Percentage depletion deductions in excess of the taxpayer's adjusted cost basis (the original cost less the sum of all depletion deductions) in a coal property are defined as a preference item that is subject to the add-on minimum tax (15 percent) for corporations and the alternative minimum tax for individuals. Also, the tax law requires corporations to reduce, by 15 percent, the percentage depletion deductions that exceed their adjusted cost basis.4/

Exploration Costs

Under current law, exploration costs are allowed as an immediate deduction against taxable income (that is, may be expensed) or may be amortized on a straight-line basis over 10 years. If exploration costs are expensed, they must be recaptured once a mine is brought into production. (The provision for recapture does not apply to exploration expenses that do not result in a productive mine.) These costs are recaptured in one of two ways: (1) the taxpayer may include the full amount of exploration expenditures as taxable income in the year the mine becomes productive (the taxpayer's cost basis in the mine is increased by the same amount at that time), or (2) the taxpayer may forgo deductions for depletion until the sum of forgone deductions equals the amount of exploration deductions. Because of these recapture provisions, 10-year amortization is probably the preferred way for taxpayers seeking to minimize taxes to treat exploration costs. In general, however, the provisions for recapture are of minor importance to the coal industry because exploration costs are only a very small part of most coal investments.5/

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4. This means that corporations cannot fully use percentage depletion once depletion deductions over the life of a property have exceeded the original cost. Instead, they must reduce these "excess" deductions by 15 percent. To avoid the compounding effect that occurs when both the corporate add-on minimum tax and the 15 percent reduction in allowable percentage depletion are operable, only 71.6 percent of the excess of percentage depletion over the adjusted cost basis of a property is included in the base of the add-on minimum tax.

5. For other hard minerals (gold, for example), the tax provisions for exploration costs are relatively more important.

Development Costs

Costs for mine development are currently allowed as an immediate deduction. They are not subject to the same recapture rules as exploration costs.

Under the Deficit Reduction Act of 1984 (Public Law 98-369), the deductions for both exploration and development costs of corporations were reduced by 20 percent. These amounts are now capitalized and treated as if they were used to acquire depreciable property in the five-year Accelerated Cost Recovery System (ACRS) class. (Depreciation under ACRS is discussed below.) In addition, these expenditures are eligible for the 10 percent investment tax credit.6/ At a 9 percent discount rate, the present value of tax savings from ACRS deductions and the investment tax credit is about equal to the tax benefit of immediate expensing. Thus, the 20 percent cutback in the deductions for exploration and development costs changes the timing of the tax savings, but not their present value.7/

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6. Depreciation deductions start, and the investment tax credit is allowed, when the expenditures were incurred--not when the mine is placed into production. This treatment is an exception to the general tax code rule that allows depreciation to be taken only when an asset has been placed into service. The investment credit is usually not allowed for assets until they are placed into service, with the exception of those that have a normal construction period of longer than two years. In these cases, the investment tax credit would be allowed for progress payments. An unresolved tax issue relates to the 50 percent basis adjustment for the investment tax credit--that is, the provision that requires firms to reduce depreciation deductions by 50 percent of the eligible investment tax credit. It is unclear from a legal standpoint whether this general provision applies to capitalized development expenditures.

7. Discounting is a way to calculate, in today's dollars, the value of a future expenditure. The result is called present value. A future expenditure is discounted to its present value using the following formula:

$$\text{Present Value} = \text{Future Value}/(1 + i)^n,$$

where n = the number of years between the present year and the year in which the expenditure is made, and i = the discount rate. The discount rate used in this analysis is 5 percent in real terms.

Depreciable Costs

Capital assets used in mining, such as drills, heavy machinery, and railway equipment, are depreciated under ACRS and are allowed the investment tax credit (10 percent, in most cases). In general, this treatment of machinery and equipment assets is similar to expensing, since the present value of depreciation deductions plus the investment tax credit nearly equals the value of expensing.8/ Thus, the tax rules for capital equipment and machinery are almost equivalent (in economic effect) to those that relate to exploration and development costs.

Buildings and structures (real property) are not eligible for the investment tax credit, although they are still depreciated under ACRS. Their recovery life under current law is 19 years, using the 175 percent declining balance method of depreciation (switching over to straight-line depreciation at the optimal time). This treatment is much less generous than that accorded machinery and equipment because of the lack of the investment tax credit.

Other Provisions

Two other special tax provisions also affect the coal industry. First, the income from royalties on coal leases is treated as a capital gain rather than as regular income for tax purposes. This means that royalty income from coal is subject to the 60 percent exclusion for long-term capital gains rather than the full income taxation that applies to most other forms of royalty income.9/

Second, coal producers--especially those engaged in strip mining--are allowed to deduct costs for land reclamation before they are incurred. Although no funds are actually set aside, a bookkeeping account is maintained to keep track of current deductions allocated to future reclamation costs. In addition, interest is imputed to the bookkeeping account to adjust for the fact that deductions are taken currently, but outlays are not made until future years. Any excess in the account (in any given year) over estimated current reclamation costs is then taxed as regular

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8. Again, present value is computed at a 9 percent discount rate. It also assumes the taxpayer is in the 46 percent tax bracket and can use all deductions on a current basis.

9. With the exception of coal, iron ore, and timber, royalties are treated as ordinary income under the income tax.

income. The present value of the early deduction of reclamation costs (in conjunction with the imputation of taxable interest income) is approximately equivalent to taking the full deduction at the time outlays are actually made.

PROSPECTIVE TAX TREATMENT OF COAL PRODUCERS UNDER THE PRESIDENT'S TAX REFORM PLAN AND H.R. 3838

The President's tax proposal and H.R. 3838 would reduce individual and corporate marginal tax rates and broaden the base of the income tax. The President's plan would reduce the top corporate rate from 46 percent to 33 percent; it would reduce the top individual rate from 50 percent to 35 percent. H.R. 3838 would reduce the top corporate rate to 36 percent and the top personal tax rate to 38 percent. The President's plan would include a 10 percent deduction for dividends paid and would lower the top tax rate on capital gains from 20 percent to 17.5 percent.10/ H.R. 3838 also would allow a 10 percent deduction for dividends (phased in over 10 years), and would reduce the exclusion for long-term capital gains to 42 percent, thereby raising the top personal rate on long-term capital gains from 20 percent to 22 percent.11/ Both the President's tax plan and H.R. 3838 would impose new alternative minimum taxes on a tax base consisting of a wide range of tax preferences.

Specific changes to the tax laws that would directly affect coal producers are discussed below.

Depletable Costs

Under the President's tax reform proposal, the tax provision for percentage depletion would be phased out over a five-year period. Instead, coal producers would be required to use indexed cost depletion in computing their depletion deduction. (Indexed cost depletion is the same as regular cost depletion, except that

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10. Although the President's proposal actually reduces the exclusion for long-term capital gains from 60 percent to 50 percent, the rate reductions more than offset this change to lower the top rate applicable to long-term gains.

11. H.R. 3838 also eliminates the reduced rates on long-term capital gains realized by corporations. Under current law, the top rate on corporate long-term capital gains is 28 percent.

deductions are adjusted to reflect changes in the general price level over time.)

H.R. 3838 would not repeal percentage depletion, but would reduce the applicable percentage for coal producers from 10 percent to 5 percent by 1988. The current 15 percent preference reduction for depletion in excess of the adjusted cost basis of the property would remain in effect. Also, the excess of depletion over the adjusted cost basis of the property would be considered part of the tax base for a new alternative minimum tax.

Exploration and Development Costs

The President's plan retains current law provisions regarding the deduction of exploration and development costs. These costs, to the extent that they exceed what would be allowed under 10-year amortization, are included in the base of the alternative minimum tax.

H.R. 3838 would retain the present rules for exploration costs and would extend the current recapture rules for exploration costs to development costs. Both preproduction exploration and development costs would be (1) included in income at the time production starts and subsequently recovered over three years,12/ or (2) at the election of the taxpayer, used to reduce the otherwise allowable deduction for depletion. The bill retains the 20 percent cutback in exploration and development costs under current law and allows them to be recovered over five years.13/ In the calculation of the alternative minimum tax base, exploration and development costs would not be expensed, but would be amortized over 10 years.14/

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12. Costs would be recovered over three years based on the double-declining balance method of depreciation, including a half-year convention.

13. These costs would be recovered according to the double-declining balance method of depreciation, with a half-year convention.

14. Consistent with no expensing of exploration and development costs, there would also be no recapture once production started.

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Depreciable Costs

The President's plan would replace the current ACRS depreciation system and the investment tax credit with a new system of capital recovery--the Capital Cost Recovery System (CCRS). Under CCRS, mining equipment and tractors would be included in a six-year recovery class. Depreciation would be computed based on a 33 percent constant rate (applied to the declining balance in the asset's account).15/ Heavy trucks would be depreciated over five years at a constant rate of 44 percent. Real property would be depreciated over 28 years at a constant rate of 4 percent.

The President's plan also includes a provision for indexing asset accounts for inflation. As a result, depreciation allowances would be automatically adjusted upward (or downward) to reflect changes in the overall price level. Thus, depreciation allowances retain their real value when inflation varies over an asset's life. The present values for deductions under CCRS for the five- and six-year classes are $93 and $91 (per $100 of expenditure), respectively. These amounts are less than the $101 in present value for ACRS (including the deduction equivalent of the investment tax credit) allowed under current law. The present value of deductions for real property under CCRS is $56 (per $100 of investment) versus $55 under ACRS.16/

H.R. 3838 also replaces ACRS and the investment tax credit (ITC) with a new system of capital recovery, referred to as the "incentive depreciation system." The new system would lengthen depreciable lives for most assets. Most machinery and equipment

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15. Under a constant-rate, declining balance system, depreciation is computed as the rate times the remaining balance. For example, the 33 percent rate applied to an asset that originally cost $1,000 would result in a first-year deduction of $333. The second-year deduction would be 33 percent of $667 (the remaining balance), or $220. This process would continue until the deduction calculated according to this method declined below the amount that would be allowed under straight-line depreciation (applied to the remaining balance). At this point, the remainder of the asset's basis would be recovered through the straight-line depreciation method. Indexing is achieved under this system by adjusting the remaining balance each year by the change in prices over time.

16. All these amounts are discounted at 9 percent, with an assumed inflation rate of 4 percent.

used in coal mining would be depreciated over 10 years (instead of five), based on the double-declining balance method of depreciation (switching over to straight-line at the optimal time). Real property is depreciated over 30 years using the straight-line method. In contrast to the full indexing allowed under the President's plan, depreciation accounts are indexed for only 50 percent of inflation in excess of 5 percent. In comparison with current law (and the President's plan), the present value of depreciation deductions (per $100 of machinery and equipment) would be substantially reduced under this bill--from $101 under current law to $72; the present value of deductions for real property would be reduced from $55 to $28.17/ In general, the depreciation system embodied in the House bill is less generous than either current law or the President's proposal for all assets. The alternative minimum tax in H.R. 3838 requires assets to be depreciated by the straight-line method over their old Asset Depreciation Range (ADR) midpoint life (40 years for real property).18/

Other Provisions

Both the President's plan and H.R. 3838 would eliminate the capital gains provision for coal royalties. Under both proposals, royalty income from coal would be treated as ordinary income.

The President's plan would repeal the allowance for early deduction of mining reclamation costs; these costs could be deducted only when the expenditure was actually made. H.R. 3838 retains present law for mining reclamation costs. In present value terms, these two provisions are about equal; thus, they would result only in timing differences and would have no significant effect on economic decisions.

COMPARATIVE ANALYSIS OF TAX REFORM PLANS

The proposed alternative tax systems have different economic effects on the coal industry. One method of measuring the effect of changes in taxation is the "cost-of-capital" approach, the method employed here. By making a series of assumptions as to

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17. Again, discounted at 9 percent.

18. The ADR depreciation system was used to depreciate most assets prior to the adoption of ACRS in 1981. ADR midpoint lives are somewhat longer than the lives required by the incentive depreciation system contained in the House bill.

the investment profile of "representative" coal mines, the cost of capital to the industry can be calculated. From this measure, an effective marginal tax rate on investment in the coal industry can also be derived. Because this methodology can be used to calculate the cost of capital and the effective tax rate in other industries, the direct effects on the cost of capital in the coal industry can be readily compared with the effects of tax reform on the cost of capital in other industries. This approach to analyzing proposals for tax reform assumes that all markets have adjusted to the new tax systems. As such, the cost-of-capital methodology does not measure short-term effects, but concentrates on long-run consequences.

As explained in the appendix, the user cost of capital is the gross return that must be earned on a particular investment in order to cover taxes, the investors' real required return, and economic depreciation. (Economic depreciation is the decline in the value of an asset resulting from wear and tear, depletion, or obsolescence.) To the extent that a tax change alters the cost of capital, output prices must adjust in order to make up the difference. In the coal industry, capital costs represent about 37 percent of the price of coal; thus, a 10 percent increase in the cost of capital would require at most a 3.7 percent increase in the output price to pay investors the same after-tax return.19/ The required price change would be reduced to the extent that other inputs can be substituted for capital as the cost of capital rises.

The required pretax return for an asset is the cost of capital less economic depreciation. The effective tax rate is then the difference between the pretax and after-tax return divided by the pretax return. These calculations are all based on an investment's entire life, taking into account all revenues, costs, and taxes.20/ For this analysis, these values have been

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19. Labor costs account for about 28 percent, and materials, supplies, and energy account for about 35 percent of the price of coal. See U.S. Department of Commerce, Bureau of the Census, 1982 Census of Mineral Industries; Coal Mining (February 1985).

20. The revenues, costs, and taxes are all discounted back to the present to calculate one overall effective tax rate. The user cost of capital and required pretax returns are average rates over the life of the investment.

calculated on a long-run basis; all tax policies are assumed to have been phased in fully.21/

The cost-of-capital approach does not take account of indirect effects of tax changes that might affect the coal mining sector. These effects might take the form of changes in interest rates, greater competition from alternative fuels such as oil or gas, or changes in demand by coal-using sectors, such as public utilities. These indirect effects may be quite important in the context of such broad tax proposals as the President's and H.R. 3838, and could ultimately outweigh the direct effects on the coal industry calculated in this paper.

In order to analyze the effect of tax reform on the coal industry, the Congressional Budget Office (CBO) applied the cost-of-capital approach to two coal projects under the alternative tax systems and current law. The two projects differ in the composition of investment. The first project is assumed to be an underground mine, with 20 percent of the investment for land and mineral rights, 15 percent for development, 55 percent for machinery and equipment, and 10 percent for real property. The second project is an open-pit (strip) mine. This project's costs are 3 percent for land and mineral rights, 12 percent for development, 55 percent for machinery and equipment, and 30 percent for real property.22/ For this analysis, exploration costs are assumed to be minimal, since the location and extent of most U.S. coal reserves have already been determined. Inventories are also ignored because they are such a small part of investments in coal mining.

In calculating the cost of capital, the real after-tax rate of return is assumed to be 5 percent, and the rate of expected inflation (for prices in general, and coal prices in particular) is assumed to be 4 percent. The calculations also assume that all relevant tax deductions and credits can be used on a current basis and do not have to be carried over into future periods. The taxpayer is a corporation in the top marginal tax bracket (46 percent under present law, 36 percent under H.R. 3838, and 33 percent under the President's proposal). The only taxes included

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21. For example, the President's plan calls for phasing out percentage depletion. For this analysis, it is assumed that percentage depletion has been repealed.

22. The low share of costs for land and mineral rights reflects the assumption that the land is leased (at a royalty rate of 12.5 percent) and not purchased, as was assumed for the first project.

here are corporate taxes--no personal taxes on capital gains or dividends are taken into account. In addition, the 10 percent deduction for dividends paid to individuals under both H.R. 3838 and the President's plan is ignored, although the deduction would tend to reduce the cost of capital.23/ Although the corporate add-on minimum tax is taken into account under current law, the alternative minimum tax systems under the President's proposal and H.R. 3838 are not considered because a coal mine may or may not be taxed under the alternative minimum tax, depending on an individual company's earnings and deductions from other operations (including other coal mines) in any given year. For simplicity, CBO assumed that the firm is not subject to the alternative minimum taxes.

Production from each coal project is assumed to decline by 8 percent annually; the real net operating profit is assumed to decline by 10 percent, reflecting both reduced production and increasing real operating costs as the life of the mine progresses. The model is calculated over discrete time periods of six months each. Land and development costs are assumed to occur in the first period; the cost of depreciable assets is spread over the first two periods. Coal production is assumed to start in the second period, and each mine is assumed to have a 30-year life.24/

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23. The deduction for dividends paid is ignored because of difficulties in modeling corporate debt-equity ratios and in attributing corporate earnings (and interest payments) to individuals.

24. Annual production rates from coal mines are typically constant over the life of the mine, but maintenance of constant production requires replacement of machinery and equipment. Thus, the model used to compute effective tax rates represents a coal mine as having declining output with no replacement of initial capital invested, instead of as having constant output with capital replacement. It can be shown mathematically that the simplifying assumption used in this computation does not change the effective tax rate. In effect, the economic depreciation rate in the formula used to compute effective tax rates can represent either a decline in net operating profits from a fixed amount of investment or the amount of replacement investment required to keep operating profits constant.

Table 1 presents the real user cost of capital, the real required pretax return, and the effective tax rate on the two coal projects under three different tax regimes: current law, the President's proposal, and H.R. 3838. Consider the first project. The cost of capital is 17.5 percent under current law. This cost covers the real required after-tax return (5.0 percent), economic depreciation (11.4 percent), and taxes (1.1 percent). The required pretax return is 6.1 percent. The effective tax rate is 18 percent. The effective tax rate is 23 percent under the President's plan, and is 36 percent under H.R. 3838.

TABLE 1. EFFECTIVE TAX RATES AND REAL USER COSTS OF CAPITAL UNDER REFORM PROPOSALS FOR TWO COAL MINING PROJECTS (In percents)

	Real User Cost of Capital	Required Real Pretax Return	Effective Tax Rate
Project 1 (Underground Mine)			
Current Law	17.5	6.1	18
President's Proposal	17.9	6.5	23
H.R. 3838	19.2	7.8	36
Project 2 (Open-Pit Mine)			
Current Law	17.3	5.9	15
President's Proposal	18.2	6.8	26
H.R. 3838	19.0	7.6	34

SOURCE: Congressional Budget Office.

NOTE: For description of projects, see text. Tax rates are computed under the assumptions that financing is 100 percent equity and that all deductions and credits can be taken on a current basis. The real after-tax return is assumed to be 5 percent; expected inflation is assumed to be 4 percent. The taxpayer is a corporation with a marginal tax rate equal to the top corporate tax rate. Taxes paid by individual shareholders on dividends and on capital gains are not counted in the calculation. The tax rate is the corporate income tax rate only.

The results for the second project are quite similar. The tax rate under current law is 15 percent, somewhat lower than for the first project. Again, the tax rates are higher for the President's plan (26 percent) and for the House bill (34 percent). Although both sets of calculations indicate that the tax rate on coal investments is likely to rise under either policy, the increase appears to be substantially greater under H.R. 3838 than under the President's plan.

The effective tax rates measured here differ significantly from average "cash-flow" tax rates based on companies' financial reports.25/ A cash-flow tax rate is based on one year's taxes and income and will generally differ from the effective tax rate calculated in this paper unless depreciation methods used on the company's financial statement precisely reflect the decline in the net present value of future profits from investments. Moreover, reported "cash-flow" tax rates include the full range of a company's operations, and the range can be quite wide in the case of conglomerate corporations. The resulting problem in estimating the tax rate on a particular activity from company data is considerable in the case of coal mining because many coal companies are owned by firms in other industries, such as oil and gas, steel, or public utilities. In addition, a cash-flow rate is an average of all the company's investments--new and old alike. In any given year, a cash-flow tax rate is likely to depend on the timing of a firm's investments and other economic conditions that may be specific to that particular year (for example, whether coal prices are going up or down). In contrast, the effective marginal tax rate used in this study pertains only to potential new investments and covers their full expected life.26/ Because of these differences, the two types of tax rates cannot be readily compared.

In order to place these calculations for the coal industry in context, the user cost of capital, required real pretax returns, and effective tax rates have been calculated for other industries. Previous CBO reports have illustrated how effective tax rates differ among industries, and how effective tax rates would be

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25. For example, see Joint Committee on Taxation, Study of 1983 Effective Tax Rates of Selected Large U.S. Corporations (November 1984).

26. This study concentrates on tax rates on new potential investments because those projects are most likely to be affected by changes in the tax law. Changes in the taxation of existing assets are likely to have only very small effects on growth in the industry.

altered by the President's tax reform proposals.27/ The estimates of effective tax rates for particular industry groups shown in Table 2 are comparable to those in earlier reports, but are not exactly the same because of different assumptions about the real discount rate and expected inflation. The calculations for coal mining shown in Table 2 are the simple averages of the same calculations in Table 1.

Current Law

Estimates of the user cost of capital and the effective tax rates for nine broad industry classes, including coal mining, are presented in Table 2. The assets included in the calculations are limited to depreciable (and depletable) assets and inventories; other assets, such as patent rights or working capital, have been excluded. Again, these calculations reflect an assumed real after-tax return of 5 percent, an expected inflation rate of 4 percent, and full use of credits and deductions on a current basis.28/ The effective tax rate refers only to the corporate-level tax and does not include any tax effects at the personal level on capital gains or dividends.

The effective tax rate on the coal mining industry (16 percent) is about 10 percentage points below the average for industries other than coal or oil and gas extraction. The tax rate for coal mining is above that for oil and gas extraction, which is estimated at 10 percent. Under current law, industries that rely relatively more on inventories and buildings and structures (not eligible for the investment tax credit), such

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27. See Congressional Budget Office, Revising the Corporate Income Tax, Chapter IV (May 1985); Effective Tax Rates and Real Costs of Capital Under Current Law and Under the President's Proposed Tax Reform, Staff Working Paper (August 1985); and Tax Reform: Its Effects on the Oil and Gas Industry, Staff Working Paper (October 1985).

28. The tax rates are relatively insensitive to the choice of the required real after-tax rate of return. However, the effective tax rates under current law and H.R. 3838 are quite sensitive to the assumed rate of inflation of 4 percent. (This assumption is consistent with CBO's latest economic forecast.) At higher expected inflation, tax rates are higher under current law and H.R. 3838, but remain virtually unchanged under the President's proposal because of its provisions for indexing.

TABLE 2. EFFECTIVE TAX RATES AND REAL USER COSTS OF CAPITAL UNDER CURRENT LAW AND REFORM PROPOSALS: 5 PERCENT REAL DISCOUNT RATE
(In percents)

Industry	Real User Cost of Capital	Required Real Pretax Return	Effective Tax Rate
	Current Law		
Coal Mining	17.4	6.0	16
Oil and Gas Extraction	15.5	5.5	10
Average--Other Industries a/	13.0	6.8	26
Manufacturing	12.9	7.3	32
Construction	14.5	7.1	29
Transportation	13.4	5.7	13
Communication	12.6	5.4	8
Public utilities	11.4	6.2	19
Wholesale and retail trade	12.0	8.0	37
Services	15.5	6.2	19
	President's Proposal		
Coal Mining	18.1	6.6	25
Oil and Gas Extraction	15.4	5.4	8
Average--Other Industries a/	15.6	6.4	23
Manufacturing	12.3	6.8	26
Construction	14.1	6.7	25
Transportation	13.8	6.1	18
Communication	13.0	5.9	15
Public utilities	11.1	5.8	15
Wholesale and retail trade	10.9	7.0	28
Services	15.6	6.3	20
	H.R. 3838		
Coal Mining	19.6	7.7	35
Oil and Gas Extraction	16.6	6.6	14
Average--Other Industries a/	13.7	7.6	34
Manufacturing	13.2	7.7	35
Construction	14.8	7.3	32
Transportation	15.1	7.4	32
Communication	14.6	7.5	33
Public utilities	12.6	7.4	32
Wholesale and retail trade	11.6	7.7	35
Services	16.5	7.2	31

SOURCE: Congressional Budget Office.

NOTE: Tax rates are computed under the assumptions that financing is 100 percent equity and all deductions and credits can be taken on a current basis. The real required return is assumed to be 5 percent; expected inflation is assumed to be 4 percent. The taxpayer is a corporation with a marginal tax rate equal to the top corporate tax rate. Taxes paid by individual shareholders on dividends and on capital gains are not counted in the calculation. The tax rate is the corporate income tax rate only.

a. Weighted by estimated replacement value of capital stock in each industry.

as wholesale and retail trade, have higher tax rates. Other industries that rely more on machinery and equipment, such as transportation and communications, have relatively lower tax rates.

The tax rates on the coal mining and oil and gas extraction industries are heavily influenced by the tax provisions that allow expensing of mine development costs and intangible drilling costs.29/ Both industries are also favored by the provisions for percentage depletion, although in the case of oil and gas producers that allowance is limited to nonintegrated producers. While the coal mining industry relies quite heavily on machinery and equipment eligible for the investment tax credit, it also uses a significant amount of real property that is relatively less favored.30/ In contrast, the coal mining industry maintains negligible levels of inventories. Overall, the calculations indicate that the coal industry is favored under the current tax law because its effective tax rate is lower than the rate for most other industries.

The lower effective tax rate on coal mining means that the industry requires a lower pretax return than other industries to generate the same (5.0 percent) after-tax return--6.0 percent versus 6.8 percent for a weighted average of other industries. This divergence in pretax returns means that an extra dollar of capital is less productive in coal mining than in other industries. Thus, net output of the economy could be increased by shifting resources out of coal mining and into most other industries. For example, if a dollar of capital was shifted from coal mining to manufacturing, a net permanent annual gain in the value of output of 1.3 cents could be achieved by the economy.31/ As long as effective tax rates diverge, there are possibilities for increasing the output of the economy in the long run by reallocating capital among industries. Efficiency gains from this reallocation can be maximized by equalizing effective tax rates across industries.

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29. Intangible drilling costs are expenditures for labor, materials, and energy used in the drilling of oil and gas wells.

30. The oil and gas extraction industry uses hardly any depreciable property that is not eligible for the investment tax credit.

31. The net gain is the return from manufacturing of 7.3 cents per dollar less the 6.0 cents lost from coal mining.

The President's Proposal

The effective tax rate for coal would rise to about the average for other industries under either the President's plan or the House bill. The coal industry would therefore have to compete for capital on a much more equal footing than under current law. The implication of this result is that the coal mining industry would contract relative to other industrial sectors.32/ This could result in efficiency gains for the economy in general as resources are shifted out of coal mining into other, more productive uses.

The tax rate for the coal mining industry would be much higher under the President's tax proposals than under current law--25 percent compared with 16 percent. This higher rate reflects repeal of the investment tax credit and percentage depletion.33/ As a result of the higher tax rate, the cost of capital for the coal mining industry would also rise under the President's proposal--from 17.4 percent to 18.1 percent, an increase of 4 percent. This increase would have to be reflected in higher coal prices in order to continue to make the investment worthwhile.

Capital costs represent about 37 percent of the price of coal. Thus, the 4 percent increase in capital costs would imply about a 1.5 percent rise in price, holding all else constant. In other words, the price of coal would have to rise by 1.5 percent to cover the additional taxes implied by the President's proposal and still allow investors to earn the same 5 percent real after-tax return. This compares with reductions in user costs that would take place for all other industries on average, including oil and gas extraction, under the President's proposals.

To the extent that prices do not rise by the full 1.5 percent, investors would earn less than the assumed 5 percent after taxes. In this case, suppliers of financial capital would bear part of the increased tax burden, as opposed to consumers of coal and of goods and services produced using coal as an input, such as electricity.

Compared with other industries, the adverse effect of the President's plan on coal mining would be relatively large: the

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32. This shifting effect is exclusive of any general expansion or contraction in total capital investment that might result from such large changes in the tax system.

33. Under the President's proposal, the expensing of mining development costs remains intact.

tax rate on the oil and gas industry would be about the same, and the average rate on other industries would actually decline from 26 percent to 25 percent. This rate would be lower because the reduction in the statutory tax rate from 46 percent to 33 percent would largely offset the curtailment of the investment tax credit. The value of this rate reduction, relative to the curtailment of preferences, is more important to other industries than to the coal mining industry.

The large increase in taxes on the coal industry indicated here is generally consistent with other studies.34/ The extent to which this increase in taxes reduces growth in the industry is, however, unclear. Although a higher tax rate would normally indicate reduced growth, the study by the Energy Information Administration (EIA) argues that this is not the case with respect to the President's proposals. The reason for this paradoxical result is that electric utilities would have their taxes reduced under the President's tax plan; therefore, they would tend to grow, as would their demand for coal. On net, the EIA report estimates that growth in demand is sufficient to offset the increased taxes on the coal industry; thus, coal output would be expanded under the President's plan.

H.R. 3838

The tax reform bill passed by the House would have larger effects on the coal industry than the President's plan. The effective tax rate under H.R. 3838 would be 35 percent compared with 25 percent for the President's proposal. The tax increase under H.R. 3838 would be greater than under the President's proposal because the depreciation system is less generous and development costs must be recaptured. These changes would be somewhat offset by the fact that percentage depletion is only reduced from 10 percent to 5 percent of gross income instead of being repealed.

The increase in the user cost of capital for the coal industry would be greater under H.R. 3838 than under the President's proposal, rising from 17.4 percent to 19.6 percent--an increase of 12.6 percent over current law. The price of coal would rise accordingly by about 4.7 percent. At the same time, the user cost would rise for most other industries as well; the

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34. U.S. Department of Energy, Energy Information Administration, Analysis of the Impacts of the President's Tax Proposal on Major Sectors of the Energy Industry (August 1985); and Price Waterhouse, The Economic Impact of the President's Tax Reform Proposals on the Coal Industry (September 1985).

average user cost of capital for other industries would increase by about 5 percent. Thus, price increases could be expected in other industries as well. But because these implied price increases would likely be less than for the coal industry, the price of coal relative to other goods would probably rise. This price effect could cause the industry to contract under either H.R. 3838 or the President's plan. As noted above, however, indirect effects, such as the increase in the public utility sector noted in the EIA report, may be large enough to alter significantly this conclusion.

The exact changes in output and employment in the coal industry resulting from either tax reform proposal depend on the price elasticity of demand for coal and products using coal. Because the amount of demand response to higher coal prices is highly uncertain, quantitative estimates of the employment and output effects in the coal industry from such broad changes in the tax system would be speculative at best.

APPENDIX: COST-OF-CAPITAL MODEL

The full effect of a tax reform proposal on any one industry should be viewed in the broad context of how it affects taxation of that industry relative to other industries. In other words, is the industry hurt more by the proposal than other industries? This is an important question because capital markets (that is, savers and investors) are primarily concerned with the relative after-tax profitability of alternative investments. If tax reform alters the current distribution of after-tax returns, investors will tend to shift their funds toward those sectors that are relatively favored.1/ Industries that are relatively favored (or merely less "hurt") by a tax change will benefit because their cost of capital will be reduced as investors shift funds into these industries, thereby lowering their required after-tax returns. An industry's cost of capital may fall even if the tax on the industry itself is increased. This study uses the "cost-of-capital" approach to analyze the effect that tax changes proposed by the Administration and by the House (H.R. 3838) would have on the coal industry and, for comparison, on other industries as well.

User Cost of Capital

The tax system affects the demand by businesses for different kinds of assets by changing the relative user costs of various forms of capital. The user cost of capital is generally defined as the cost to a firm of employing a unit of capital for one period. It is equivalent to what a firm would have to pay to lease the same unit, assuming perfectly competitive markets. Hence, the terms "user cost" and "rental cost" are commonly used interchangeably. In long-run equilibrium, the user cost of an asset will also equal the marginal revenue it produces, since

1. To the extent that savers and investors (in the aggregate) provide a lower amount of financial capital because of an increase in taxes on capital income, the overall level of new investment could shrink. At present, however, there is no consensus on how sensitive the rate of national saving is to changes in the effective tax rate on capital income. Some economists argue that saving is very sensitive to changes in capital taxation; others argue that there may be no effect at all.

otherwise firms would have an incentive to shift the level or composition of their capital stock.2/

The user cost includes the amount of capital consumed (or economic depreciation), taxes, and a net after-tax return paid to investors. In the absence of taxes, the real user cost of capital (C) equals the sum of economic depreciation (d) and the competitive rate of return (r) multiplied by the asset's acquisition cost (q).3/ That is:

$$C = q(r + d)$$

where q = asset acquisition cost

r = real rate of return

d = rate of depreciation of output

In this case, depreciation is the exact amount that the firm needs to recover in order to leave its total capital intact. This equation is based on an asset whose productivity is assumed to decline at a constant rate over time. By setting the cost of the asset (q) equal to one, the user cost of capital, per unit of capital, is equal to the sum of the real return and economic depreciation; that is, $C = r + d$.

When taxes are imposed on the income from capital, the cost of capital rises to cover the taxes, as well as to cover the return to investors and depreciation.4/ Under the assumption

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2. If an asset's revenue is less than its user cost, the asset is unprofitable and will not be acquired. Conversely, if its revenue is more than its user cost, firms will buy more of the asset. Equilibrium is reached when revenue equals cost and firms have no incentive to alter their capital stock.

3. See Jane G. Gravelle, "Effects of the 1981 Depreciation Revisions on the Taxation of Income From Business Capital," National Tax Journal (March 1982), pp. 1-20, for a derivation of the equations for the user cost of capital and the effective tax rate.

4. If, instead, it is assumed that pretax returns remained fixed, and the after-tax return declines in response to the imposition of the tax, the user cost of capital remains unchanged. In this case, the suppliers of capital (savers) bear the full cost of the tax through a reduced after-tax

that investors require a fixed real after-tax rate of return (r^*), the user cost of capital (per unit of capital) is equal to:

$$C = (r^* + d)(1 - uz - k)/(1 - u)$$

where r^* = required real after-tax rate of return (real discount rate)

z = present value of depreciation allowances (discounted at the nominal after-tax interest rate)

k = investment tax credit rate

u = corporate tax rate

In this equation, the present value of depreciation allowances (z) refers to those allowed by the tax code. It also includes items such as tax depletion, amortization, and any other form of deduction allowed for recovery of capital expenditures. This equation demonstrates that the user cost of capital is lowered by increases in either the present value of capital recovery allowances or the investment tax credit rate (k), and rises if the tax rate (u) is increased. (For this analysis, the only tax considered is the corporate income tax. In other words, (r^*) reflects the return that investors require after the corporate tax, but before individual income taxes.)

Suppose the tax law allows firms to deduct actual (or economic) depreciation indexed for inflation, thereby allowing firms to keep their real capital intact, without providing any investment subsidy.5/ Also assume that no investment credit is allowed. In this case, the user cost per unit of capital is simply:

$$C = (r^*/(1 - u)) + d$$

The user cost is equal to the pretax rate of return plus depreciation. The pretax rate of return ($r^*/(1 - u)$) equals the required after-tax rate of return (r^*) increased by the amount of income taxes.

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rate of return. (This alternative assumes that the supply of capital is perfectly inelastic.)

5. With a constant rate of economic depreciation (d), the present value of depreciation per dollar of investment is equal to $z = d/(r^* + d)$.

Effective Marginal Tax Rates

In general, the effective marginal tax rate for an asset is calculated as the difference between the pretax and after-tax rates of return, divided by the pretax rate of return:

$$TR = (r - vr^*)/r$$

where TR = asset tax rate

r = real pretax rate of return

r^* = required real after-tax rate of return

The required after-tax rate of return is the return that the corporation must earn over the life of the asset in order to undertake the investment. (This assumes that the corporation has other investment opportunities from which it can earn as much as r^*.) In equilibrium, (r) is the pretax rate of return that yields (r^*) after taxes. The effective tax rate derived by this method is the theoretical tax rate that would result under a certain set of assumptions, including assumptions of depreciation, inflation, and interest rates, as well as an assumption that all deductions and credits can be fully used on a current basis. This same general mathematical formulation has been used in several studies to estimate effective marginal corporate tax rates.6/

The rate of return (r) that yields (r^*) after taxes is defined by:

$$r = \frac{(r^* + d)(1 - uz - k)}{(1 - u)} - d$$

where r = pretax rate of return

r^* = required after-tax rate of return

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6. See Alan J. Auerbach, "Corporate Taxation in the United States," Brookings Papers on Economic Activity 1983: 2 (Washington, D.C.: The Brookings Institution, 1984), pp. 451-514; Jane G. Gravelle, "Effects of the 1981 Depreciation Revisions on the Taxation of Income From Business Capital," National Tax Journal (March 1982), pp. 1-20; Charles R. Hulten and James W. Robertson, Corporate Tax Policy and Economic Growth: An Analysis of the 1981 and 1982 Tax Acts, Urban Institute Discussion Paper (December 1982): and Mervyn A. King and Don Fullerton, The Taxation of Income From Capital: A Comparative Study of the United States, United Kingdom, Sweden, and West Germany (Chicago: University of Chicago Press, 1984).

d = economic depreciation rate

k = investment tax credit rate

u = statutory tax rate

z = present value of tax depreciation deductions (discounted at the nominal after-tax interest rate)

This formula yields an effective tax rate equal to the statutory tax rate when economic depreciation or depletion (indexed for inflation) is allowed (and the investment credit is disallowed). With an investment tax credit or with a present value of depreciation allowances greater than economic depreciation, the effective tax rate is lower than the statutory rate.

Under current law, the present value of depletion and depreciation deductions consists of a number of factors that represent different components of a coal mining investment. In the case of the first coal project (the underground mine, discussed in "Comparative Analysis of Tax Reform Plans" in the text), for example, it is assumed that the investment consists of the costs of land and mineral rights (20 percent), machinery and equipment (55 percent), real property (10 percent), and development (15 percent). Since most coal reserves in the United States are already known, exploration costs are minimal and are ignored in this model. Inventories, which are negligible for the coal mining industry, are also ignored.

The present value of depletion and depreciation for the underground coal mine project can be expressed as:

$$z = .65(dep) + .15(.80 + .20(ddep)) + depl$$

where dep = present value of depreciation (for both machinery and equipment and real property) plus the investment tax credit (on a deduction equivalent basis)

ddep = present value of "depreciated" development costs

depl = present value of depletion deductions

The first term (dep) in this expression refers to the present value of depreciation on machinery and equipment and real property, and includes the deduction value of the investment tax

credit.7/ The second term (ddep) reflects the current treatment of development costs: 80 percent of those costs is expensed immediately, and the remaining 20 percent is "depreciated" over five years.

The third term (depl) is for depletion. The calculation of depletion is computed on a discrete time basis and takes account of the 50 percent taxable income limit on percentage depletion,8/ the reduction in percentage depletion in excess of the cost basis, and allows for depletion to be the greater of percentage depletion or cost depletion. The 15 percent add-on minimum tax is also computed for depletion in excess of the cost basis.

For industries other than coal, calculations of user costs were performed on the basis of continuous time. Because of the complexity of the tax law regarding coal companies, the calculations for this industry were performed on a discrete time basis as noted above. This difference in computational methods affects the results, albeit in a minor way. Because of this effect, and other data limitations, differences in effective tax rates across industry groups of less than three percentage points should be considered insignificant. Differences for a given industry, across policies, however, more accurately reflect changes in the level of taxation.

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7. The deduction value of the investment tax credit is equal to the credit amount divided by the tax rate. If the credit is 10 percent and the tax rate is 46 percent, the deduction value equivalent of the credit is about 22 percent.

8. For the projects analyzed in this study, the 50 percent taxable income limit on percentage depletion was an effective limit during the first five year's of a coal property's life; in those years, ACRS depreciation deductions severely reduced taxable income. In later years, the project was eligible for the full percentage depletion deduction of 10 percent.