ANALYSIS OF THE TAX IMPLICATIONS OF RAPID AMORTIZATION

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TAX REFORM ACT OF 1976

Section 2112 of the Tax Reform Act of 1976 (P.L. 94-455), signed into law October 4, introduces some significant changes affecting tax treatment of certain pollution control facilities. Prior to 1976, a firm investing in pollution control equipment for an existing plant could elect one of two options: rapid amortization or normal depreciation practice, called here standard amortization. If rapid amortization was chosen then the first 15 years of depreciable life could be amortized over a 5 year period. However, by so doing the firm had to forego the investment tax credit.

The provisions of 26 U.S.C. 169 which authorized the rapid amortization of pollution control equipment expired as to facilities installed after December 31, 1975. But the new legislation restored rapid amortization as a permanent provision for facilities installed after December 31, 1975 in plants in operation before January 1, 1976. Further, for those facilities installed after December 31, 1976, the new law permits the concurrent use of rapid amortization and the investment tax credit; however, if the tax credit is used in conjunction with rapid amortization only one-half of the currently allowable investment credit may be claimed.

In restoring rapid amortization, Congress left the rules governing eligibility for certification essentially unchanged, since process changes to accommodate cleaner production methods remain ineligible.1/ However, the Code has been modified to allow the certification of processes that prevent the creation of contaminants (e.g., fuel desulfurization equipment if the fuel is burned on-site) when installed in an existing plant.

These revisions were precipitated by the fact that, after the reinstatement of the investment tax credit in 1971, 26 USC 169 was used only infrequently because the standard investment tax credit plus standard amortization practice provided greater tax benefits. The concurrent use of the investment tax credit and rapid amortization now authorized appears to make the rapid amortization option more attractive to the investor in pollution control equipment.

1/Section 2112 excludes from eligibility equipment which increases output or capacity by more than 5 percent, extends the useful life, or reduces the total operating cost of the plant. Further, rapid amortization can only be applied to facilities with a depreciable life greater than 5 years. For a more precise definition of facilities which may be certified for rapid amortization the reader should refer to 40 CFR, Part 20, Certification of Facilities.

ANALYSIS OF THE TAX BENEFITS UNDER THE NEW LAW

The present value of the flow of tax benefits resulting from a capital investment is determined by a basic relationship between four principal variables: (1) the discount rate, 2/ (2) the asset life, (3) the method of depreciation, and (4) the investment tax credit. The first two variables have the largest effect on the value of the flow of tax benefits. And, within certain distinct limits, it can be said that higher discount rates tend to make rapid amortization more attractive to the investor, as do relatively long asset lives. By contrast, the choice of depreciation method has relatively little effect on the value of the tax benefits. In fact, the sum-of-years digits method is always preferred over other depreciation formulas if asset life is more than 5 to 6 years. 3/ Finally, the size of the investment tax credit has a measurable impact on the desirability of rapid amortization. If the firm is eligible for a relatively large credit in relation to the investment, the attractiveness of rapid amortization will be diminished.

Past changes in the investment tax credit have also significantly altered the benefits provided by rapid amortization. When 26 USC 169 was originally enacted in 1969, the investment tax credit was repealed. Later, in 1971, Congress reinstated the 7 percent credit and many firms found that rapid amortization no longer provided tax advantages, particularly those installing equipment with short to moderately long asset lives. The subsequent increase in the investment tax credit to 10 percent under the Tax Reduction Act of 1975 eliminated the benefits of rapid amortization for almost all investors.

The following analysis of the tax implications of the new law was performed based upon some key simplifying assumptions. Hence, the conclusions, while providing a satisfactory order of magnitude assessment for the general case, may be imprecise when applied to specific situations. First, a corporate tax rate of 48 percent and a state income tax rate of 4.8 percent were used, the latter representing a typical rate for most states.

2/The discount rate is rate used to determine the value today of a future stream of cash flows.

3/The magnitude of tax benefit provided by rapid amortization over standard amortization practice is influenced by the method of calculating depreciation selected by the investor, an effect separate from the one attributable to the decision to use rapid amortization. This analysis was performed using the two accelerated depreciation methods utilized by most investors: sum-of-years digits and double declining balance. If standard amortization practice is used, it was found that for equipment with depreciable lives more than 5 to 6 years, sum-of-years digits provided the greatest tax advantages. And, if rapid amortization were selected double declining balance was never uniquely preferable to sum-of-years digits (for that portion of depreciable life which exceeds 15 years).

In practice, the marginal rate may vary from the assumed total of 52.8 percent. 4/ However, this will not effect the decision to select rapid amortization; it will only change the present value of tax benefits. Second, the actual size of the investment tax credit can vary significantly. This analysis is based on a graduated credit, with the full credit applicable only when the useful equipment life is greater than or equal to 7 years. If the credit realized by the firm is less than assumed here then, other things being equal, rapid amortization will be attractive for equipment with slightly shorter life than this analysis would indicate.

Benefits Provided by Rapid Amortization

In the range of discount rates which are applicable to most firms (greater than 8 percent) we find that rapid amortization under the new law is attractive for pollution control equipment with depreciable lives longer than 11 to 12 years. For equipment with shorter lives, standard amortization yields greater tax savings. Exhibit I depicts this relationship.

It is interesting to note that under the new law the point of indifference between rapid amortization and standard amortization practice does not change significantly for discount rates roughly above 14 percent. This is due to the fact that at high discount rates the immediate cash flow emanating from the investment tax credit is so highly valued that future benefits resulting from rapid amortization are outweighed.

The magnitude of the potential tax benefits provided by the new tax law over standard amortization practice varies as a function of discount rate and depreciable equipment life. For illustrative purposes, Exhibit II plots the tax benefits against depreciable life based on a discount rate of 12 percent. Assuming a depreciable equipment life of 14 years the rapid amortization provision yields an additional tax advantage of about 5 percent in real terms over standard depreciation methods (a present value of tax benefits of $431 per $1,000 investment as opposed to $409 per $1,000 investment).

Benefits Provided by the New Law Over the Previous Law

The new tax law also provides significant tax benefits beyond those allowed under the old provisions of 26 USC 169. These increased advantages result from the fact that the new tax law permits investors to take one-half of the investment tax credit in addition to rapid amortization, whereas prior to the new law, firms were not allowed

4/The investment decision should be analyzed as a commitment of funds at the margin. Hence, the appropriate corporate tax rate for this analysis is the marginal rate and not the effective rate. Although effective corporate tax rates are substantially lower than 52.8 percent, we believe that this figure is representative of the marginal rate.

to take advantage of both. As Exhibit I indicates, the point where rapid amortization becomes attractive now has shifted to the left (forward). At a discount rate of 10 percent, rapid amortization under the new law provides tax advantages for equipment with a depreciable life of 12 years. By contrast, during 1975, the former 26 USC 169 would only have been beneficial for pollution control equipment with lives longer than 18 years.

An additional insight can be gained by adding broader perspective to the analysis. When 26 USC 169 was originally enacted in 1969, it provided attractive benefits to almost all investors. However, the reinstatement of a 7 percent investment tax credit in 1971 had the effect of making standard amortization practice attractive to firms installing equipment of short to moderate life - that is less than 14 to 15 years. Increasing the investment tax credit to 10 percent shifted the point of indifference by 3 to 4 years, further reducing taxpayer interest in rapid amortization. Hence, a key benefit of the Tax Reform Act of 1976 is to make rapid amortization desirable for shorter-lived equipment once again, while increasing the present value of tax benefits for users of rapid amortization.

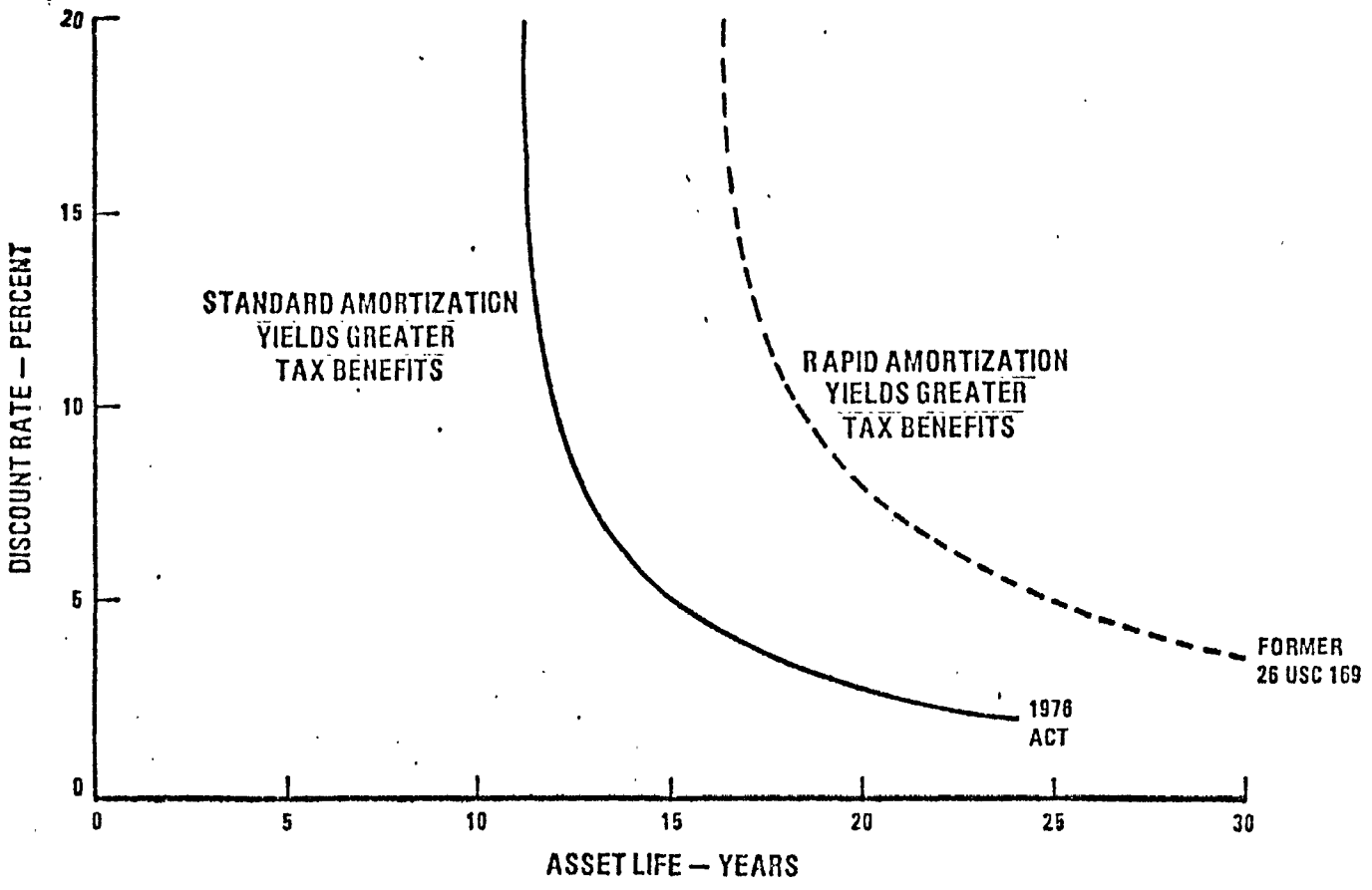
The actual size of the advantage created by the new law over former 26 USC 169 will change depending on depreciable life and discount rate. But based on an investment in pollution control equipment having a depreciable life of 20 years, the new law could provide an additional tax advantage of 10 percent over what was previously allowed under Section 169 during 1975, assuming a discount rate of 12 percent (Exhibit III).

* * *

The remaining question is how much pollution control equipment will have depreciable lives greater than 11 to 12 years. Unfortunately, there is no straightforward answer. Since much pollution control equipment will be depreciated under the same guidelines as the productive equipment to which it is attached, the same kind of pollution control facility could be depreciated at different rates depending on the industry.

EXHIBIT I

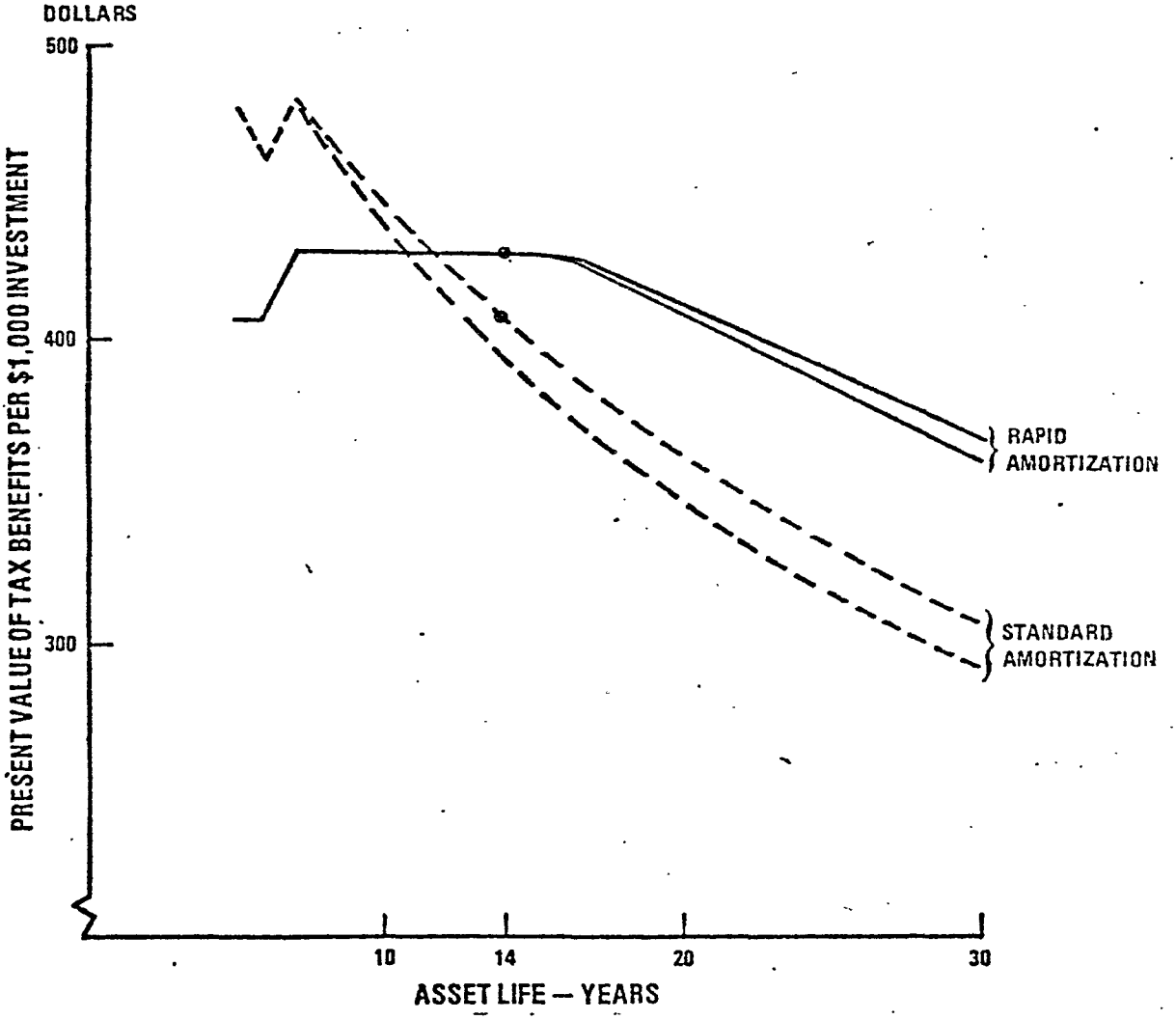
INDIFFERENCE CURVE FOR AMORTIZATION OPTIONS UNDER THE TAX REFORM ACT OF 1976 AND FORMER 26 USC 169: STANDARD AMORTIZATION VS. RAPID AMORTIZATION



NOTE:
BOTH CURVES ARE BASED ON A 10% INVESTMENT TAX CREDIT.

EXHIBIT II

TAX REFORM ACT OF 1976
PRESENT VALUE OF TAX BENEFITS

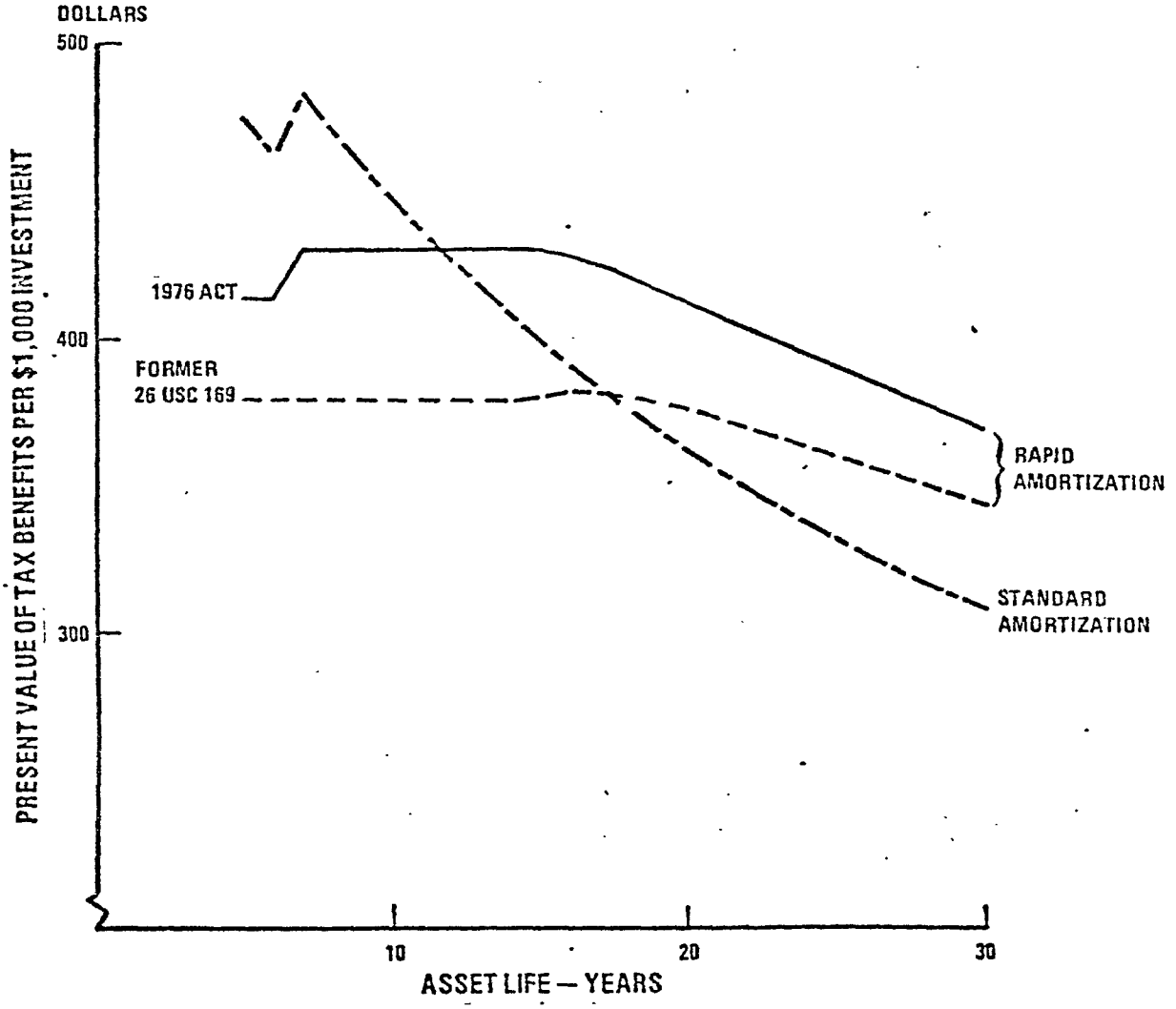


NOTES:

1. FOR EACH SET OF CURVES (RAPID AND STANDARD AMORTIZATION), THE HIGHER VALUES RESULT FROM THE USE OF SUM-OF-YEARS DIGITS AND LOWER VALUES FROM THE DOUBLE DECLINING BALANCE METHOD.
2. PRESENT VALUE OF TAX BENEFITS WERE CALCULATED USING A DISCOUNT RATE OF 12%.
3. THE INITIAL DIP IN THE CURVES IS CAUSED BY THE FACT THAT EQUIPMENT WITH AN ASSET LIFE OF LESS THAN 7 YEARS IS NOT ELIGIBLE FOR THE FULL INVESTMENT TAX CREDIT.

EXHIBIT III

COMPARISON OF BENEFITS
TAX REFORM ACT OF 1976 AND FORMER 26 USC 169



NOTE:
PRESENT VALUES WERE CALCULATED USING SUM-OF-YEARS DEPRECIATION METHOD, A DISCOUNT RATE OF 12%, AND A 10% INVESTMENT TAX CREDIT.