

BACKGROUND PAPER

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The Tax Treatment of Capital Assets and Its Effect on Growth: *Expensing, Depreciation, and the Concept of Cost Recovery in the Tax System*

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Introduction

Congress is debating major reforms of the corporate and individual income taxes. One expressed goal of the exercise is to promote economic growth while lowering the deficit. Growth is key. Without it, employment and incomes will suffer, and the hoped-for tax revenue will not appear. Proper tax treatment of the cost of plant, equipment, and buildings is an important and underappreciated prerequisite for a pro-growth tax system. This paper seeks to explain the nature of capital cost recovery as it is currently treated by business planners, accountants, and the tax code, and to describe the reforms needed to produce the best economic and budget outcomes.

In the early days of the corporate income tax, businesses were allowed to report the costs of their assets to any schedule they chose. Later, efforts were made to set rational guidelines for such reporting based on the expected lives of the assets. The accounting profession chose a few methods for financial statements. The Congress and the IRS chose different methods for tax purposes (and changed them again and again). These efforts were hardly scientific. (Why is the Empire State Building like a telegraph pole? See

below!) Worse, they focus on fundamentally unknowable asset lives instead of on the relatively clear issue of what is best for the economy.

This is a significant issue. How capital assets are accounted for in the tax code dramatically affects what is defined as taxable income and, thereby, directly influences the cost of capital. The higher the cost, the less capital is formed, and the slower the economy will grow. The lower the cost, the bigger the economy will be, and with it the number of jobs and the level of wages.

Getting cost recovery right is immensely important for the well-being of the population. Economic growth, not budgetary convenience, should be the determining factor in crafting cost recovery in tax reform.

Tax rates and tax base

There are two broad issue areas to consider in tax reform—the tax rates and the tax base. The current tax code imposes a variety of statutory tax rates on different levels and types of income, such as the 35 percent top corporate tax rate, the various marginal rates from 10 percent to 39.6 percent in the personal income tax, and the 15 percent or 20 percent tax rates on capital gains and dividends. The tax base is whatever the tax code defines as income subject to tax. Consequently, tax revenue is equal to the tax rate times the tax base.

The current reform mantra is to “broaden the tax base and lower the tax rate.” This is intended to promote efficiency and growth. A bigger economy would mean a bigger tax base, and would be all to the good. However, this is not what is currently meant by “broadening the base.” In the current reform discussion, broadening the base means expanding the definition of what is taxable by eliminating some deductions, exclusions, exemptions, and credits from the tax code. However, many deductions, ones that measure the cost of doing business and earning income, are necessary to correctly determine income. Other deductions are special favors to encourage specific activities or to reward favored groups of taxpayers. Tampering with the former would inaccurately measure income and depress growth. Eliminating the latter would reduce distortions, which would be beneficial for growth, especially if the proceeds were used to reduce tax rates. It is important for Congress to understand which is which.

In the case of income taxes, the tax base as set in current law is often significantly different from the actual income of the taxpaying businesses or individuals. When the tax base is improperly defined, it makes the effective tax rate on true income quite different from the apparent statutory tax rate. Therefore, rate and base considerations are equally important. Mistakes in defining the tax base can alter the tax rate and affect the amount of economic activity, and may affect different businesses, industries, and individuals very differently.

Before Congress considers tax reform, it should first learn where the current tax system

measures income correctly and incorrectly and determine what the tax base ought to look like. Then, as it alters the tax code, it must examine the combined effect of changes in tax rates and the tax base on the effective marginal tax rate, and the resulting ability and incentive to save, invest, and employ capital and labor in the United States. Otherwise, the growth objective may be lost in the shuffle, everyone’s income will suffer, and the expected revenue will not materialize.

What is income?

It must be clearly understood that, in the case of a business, the correct real-world definition of profit (income) is revenue less the costs of earning the revenue. Sales are not profit. Costs must be subtracted to get profit. Some costs are understated or disallowed altogether in the current tax code, and, to that extent, the current code incorrectly defines, overstates, and overtaxes profit. (See the discussion of cost recovery, below.) Tax deductions for costs are necessary and proper, and should not be eliminated or watered down for the sake of base broadening. Doing so would (further) overstate income and raise the effective tax rate, counteracting the statutory rate cut supposedly being funded by the base change.

Consider a corner grocery store. Its costs include rent, electricity, gross wages (including taxes on the wages), property taxes, interest on a loan, the wholesale cost of the groceries it stocks, etc. Each of these costs is deducted from its sales to determine its taxable profit. For example, a can of soup may cost the store \$2.00, its pro-rata share of other operating expenses may be \$0.70, and the store may sell it for \$3.00. Therefore, the profit is \$0.30. Total profit is revenues less costs.

Deducting the cost of a can of soup that is only on the shelf for a few days, or the wages of workers who are paid weekly, or the current electric bill, is quite simple. These costs are subtracted quickly as they occur.¹

Life gets more complicated when the items being purchased are capital assets, assets that last and contribute to output for more than one year and potentially a very long time. Suppose that the proprietor of the store owns the building in which it is housed. He bought the building the year the

¹ Well, not so fast. The tax law says that the store cannot deduct the cost of the soup inventory until it sells it, counting it then as “cost of goods sold.” So if the soup is on the shelf from December 31 to January 3, its cost has to be deducted in the next tax year. This is a cumbersome, sneaky way to accelerate tax collections. More on this later.

store opened. It provides a base of operations and contributes to revenues for many years. So do the store's cash registers and the shelving. Should these capital assets be counted as costs when they were bought, or should the costs be stretched over many years?

Two approaches to cost recovery for capital assets: cash flow and depreciation

Businesses need to determine the cost of their assets for three reasons: 1) for their own investment planning purposes, 2) for financial reporting to their shareholders, and 3) for calculating their taxes. Unfortunately, each reason currently involves different methods of varying accuracy.

The key issues relating to the allocation of the cost of capital assets are *timing* and *amount*. When are businesses allowed to recognize the cost of their assets, and how much of the cost is allowed at each point in time and in total?

There are two approaches to recognizing the cost of capital assets. One is *cash flow*, in which all costs are subtracted (expensed) as soon as they are incurred. The other is *depreciation*, in which the cost is spread over the assumed economic life of the asset by some formula.

Cash flow expensing is in tune with human nature and is the preferred approach of business economists. Every business school finance textbook teaches MBA candidates to use expensing in the investment planning process to determine if a project is economically viable. Expensing fully reflects the cost of the assets being acquired. If allowed in a tax setting, expensing results in a tax system which has minimal distorting effects on investment behavior, production, and income, and is economically optimal.

Depreciation in one form or another is favored by the accounting profession, most taxing authorities, public finance analysts, and those who intend the tax system to play a large role in the redistribution of income. It is used for financial reporting and, in most cases, for determining tax liabilities. Depreciation does not fully reflect the cost of the assets being acquired. Depreciation results in a tax system that reduces capital

formation as a whole and often creates distortions in the types of capital acquired and the allocation of capital among industries. It is economically adverse.

For financial reporting by publicly traded businesses to their shareholders and the investment community, businesses follow GAAP² accounting conventions to calculate *book depreciation* and *book profits*. Firms have some flexibility in selecting their depreciation for financial reporting under GAAP. The formula may allocate the cost in equal "straight line" installments over its expected life or by some faster methods (such as various types of *accelerated depreciation*).

For tax calculation purposes, businesses are required by tax law to account for their costs of capital assets by means of *cost recovery allowances*. The allowances are amounts of revenue set aside as non-taxable to "recover the costs of investment" to determine net income or profit. The tax code offers limited choices of cost recovery methods and sets strict rules for each type of asset which can vary by industry. The allowances have usually taken the form of prolonged write-off methods such as depreciation or amortization of the costs over time. In some circumstances (as for small businesses) and in some years they have allowed immediate expensing of some or all of the costs. At various times the allowances have been augmented by investment tax credits (ITC). Congress sets the tax depreciation rules with many factors in mind, and they do not necessarily follow GAAP. Therefore, tax and book depreciation may not be the same.

Cash flow expensing of costs for investment planning purposes

The case for immediately acknowledging the full cost of a capital asset rests on two simple ideas: opportunity cost and the time value of money.

Opportunity cost

Opportunity cost, a central concept of Economics 101, is the observation that if you spend your money on one thing, you cannot spend the same money on something else. If you spend a dollar of your income on an apple, you cannot use the same dollar of income to buy an orange. You rank your preferences and decide that

² GAAP is the Financial Accounting Standards Board's Accounting Standards Codification of Generally Accepted Accounting Principles.

you value the apple a bit more than the orange (your next most favorite use of the income), so you buy the apple.

Suppose that the grocery store owner buys a \$1,000 cash register expected to last for five years. He cannot buy a fifth of the cash register each year. He has to buy the whole thing or do without it. The whole \$1,000 of the store's money is tied up in the machine from the moment of the purchase. It is not available to buy more soup, pay more wages, or earn interest in the bank. The opportunity cost of the investment is the full \$1,000, and it is incurred instantly. The store owner knows this and makes his decision about whether to buy the cash register this week for \$1,000 or whether to buy a truckload of melons instead.

Present value, marginal rate of time preference, and the time value of money

J. Wellington Wimpy was famous in the old Popeye cartoons for his lust for hamburgers and his mooching ways. "I will gladly pay you Tuesday for a hamburger today!" But there were two things wrong with Wimpy's offer. First, obviously, you knew he would not pay up on Tuesday. Second, there was never any mention of interest. Interest is important. A dollar next Tuesday is not the same as a dollar today, even with ironclad collateral. Interest makes up the difference.

That is why the store owner in the previous example would never plan his business decision using depreciation. He would not pretend that the \$1,000 cost of the cash register is stretched over the asset's lifetime, perhaps \$200 a year for five years. A dollar five years from now is not worth as much as a dollar today. Everyone senses this. Economists call this feeling the *marginal rate of time preference*. It is part of what is known as the *time value of money*.³ It is the reason why interest rates are not normally zero (absent truly massive and bizarre interventions by the Federal Reserve). It is hard-wired into our brains.⁴

Present value is how much an amount of money, or any other thing of value, which is to be received in the future is worth today. To judge the present value of a spread-out future benefit or cost, one must discount the out-year dollars by an appropriate discount rate. This is often thought of as some market interest rate, but it should be a rate that reflects the opportunity cost of the individual or business if it were to use the money for something else. (See Graph 1.) This year's write-off of \$200 would be worth \$200. But if the discount rate is an illustrative 5 percent, then the \$200 cost a year from now would be worth only \$190.48 today ($=\$200/1.05$). A \$200 cost two years from now would only be worth \$181.41 today ($=\$200/1.05^2$); three years from now, \$172.77 ($=\$200/1.05^3$); and four years from now, \$164.54 ($=\$200/1.05^4$).

The five year sum of the discounted cost allowances for the cash register would only be \$909.19 in present value, which is \$90.81 less than the actual \$1,000 cost. If this were to lull the store owner into buying the cash register instead of the melons, he might be making an incorrect business decision. That is why business school finance courses repeatedly and emphatically warn MBA candidates to use cash flow, not depreciation, to value an asset.⁵

Present value can also be thought of as the amount one would have to set aside today at the chosen discount rate to grow to equal the desired future value. To have \$200 next year, one would need to set aside today \$190.48 at 5 percent; to have \$200 in two years, one would set aside \$181.40 today, etc. The sum of the set-asides over the life of the asset would be the present value of the stream, \$909.19. But this option is not open to the store owner if he wants to buy the machine today.

Another way to think of the spreading of costs is to ask what the firm would have to pay to borrow in order to spread the payments over five years. It would put \$200 toward the cost of the machine and borrow \$800 for the rest. It would

³ In riskless situations, such as two- to seven-year inflation-adjusted Treasury notes, the real time value of money is between 1 percent and 2 percent in most years (after inflation but before taxes). In the riskier private sector, it is about 6 percent after inflation and a bit above 3 percent after inflation and taxes, on average, over time. In very risky situations, it is higher.

⁴ As the brain matures, people develop an awareness of time preference at an early age as well as an appreciation for being paid to wait. Offer a two-year-old the choice between one candy bar today or two candy bars tomorrow, and he'll have the chocolate stuffed into his mouth before you finish the sentence. Make the same offer to a four-year-old (at a two-for-one rate well above the average observed rate of time preference), and he'll likely decide to wait. And that is well before he is old enough for business school.

⁵ To value a project: 1) list each cost in the year it is estimated to occur; 2) list all expected revenues in the years they are expected to occur, less the taxes estimated in each year; 3) discount each year's cost and after-tax revenue to its present value using a discount rate that reflects the returns the firm could get in other uses of the money; 4) add the discounted revenues together, as well as the discounted costs. If the summed revenues exceed the summed costs, go ahead with the project. It will add value to the firm and the economy. If not, don't do it. It would subtract value.

Graph 1. Time Value Of Money
Present Value Of \$200 Today Vs. \$200 In Later Years



pay off \$200 a year to the bank, paying interest on \$800 the first year, \$600 the second, \$400 the third, \$200 the fourth, and retire the loan in the fifth year. That added interest cost would have to be added to the cost stream, bringing it back up to \$1,000 in present value terms. Thought of that way, the store owner would never make the mistake of underestimating the cost of the cash register.⁶

Depreciation for financial reporting

Accounting for the cost of capital is also important in reporting the earnings of a business to its current owners, potential investors, and potential lenders. Unfortunately, current accounting conventions leave much to be desired. They standardize reporting, which is good, but they muddy some issues and can interfere with public policymaking.

In reporting earnings to shareholders, accountants require businesses to report their capital spending using some form of depreciation. The favored method for these accounting purposes is straight line depreciation, attributing the outlay evenly over the expected life of the asset. Thus, if a \$1,000 cash register is expected to last five years, its cost might be reported as \$200

per year over five years. Or if the firm expects to sell it for scrap value of \$100 in the fifth year, it might report its net cost as being \$900, spread out as \$180 per year for five years.

Some assets lose value more rapidly over time than straight line and some businesses report the depreciation on an accelerated basis. Accountants regard this as mainly a timing issue. Consider this explanation of accelerated depreciation from Accounting Coach:

Accelerated depreciation is an alternative to the straight-line depreciation method. Compared to the straight-line method, accelerated depreciation methods provide for more depreciation in the early years of an asset's life but then less depreciation in the later years. Under any depreciation method, the maximum depreciation during the life of an asset is limited to the cost of the asset. The difference in depreciation methods involves when you will report the depreciation. It's a matter of timing. Again, the total depreciation during the life of the asset is the same regardless of the depreciation method used.⁷

In the accounting world, depreciation may be just a "matter of timing." But in the real world, time is money. The timing of costs

⁶ These examples are illustrative. At the present time, a saver can't get anything like 5 percent from a bank savings account, and even the returns on real business fixed investment are depressed below their long run trend of about 3 percent after taxes and inflation, or about 9 percent inclusive of taxes and inflation. But the current interest and income situation cannot last forever, and most economic projections have interest rates returning to normal levels within a few years.

⁷ Accelerated Depreciation, ACCOUNTINGCOACH.COM, www.accountingcoach.com.

matters very much to the business planner trying to determine if an asset is worth buying. He must consider the time value of money and the opportunity cost of the money tied up in the machine, building, land, or inventory, whether they are depreciable assets or permanent fixtures. The accountant ignores the time value of money, which is a very strange thing for an otherwise precise professional to do.

Telling a pleasing story with financial reporting

Why do accountants and businesses spread the cost over time in financial reports? They do it in part for convenience of exposition, to tell a simpler story to the shareholders and the world. They are trying to match up the cost of an asset with its earnings over time, even if the two do not in fact coincide. This story is easier to understand than the time-value-adjusted analysis for investment purposes, but it is less accurate. Some important information is omitted.

Consider a utility that is expanding its hydroelectric capacity by building a \$1 billion dam this year. The current expense is large, but the dam will then cost nothing more for a hundred years and is expected to add \$100 million a year to earnings. Suppose that the utility's current annual earnings from earlier investments are \$200 million, a level it has reported for many years and that people are used to seeing. If the utility were to report the full expense of the new dam all at once, it would report a major loss of \$800 million this year (\$200 million income from existing operations less the \$1 billion investment) due to the outlay for the dam. This might shock some shareholders who do not read the fine print about the investment. Next year, the utility would report \$300 million in income as the new dam began to produce, and so on for many years.⁸

Rather than scare the investors and show wide swings in income, the utility may choose to display the cost of the dam as \$10 million a year for a hundred years. Its current income is reported as \$190 million (\$200 million less the \$10 million depreciation) and next year as the power is sold it

will report \$290 million a year for years to come. This is a more stable path of reported earnings and more pleasing to view, but it is not the real pattern. It makes the dam look less expensive than it really is (about \$304 million in present value at a 3.25 percent real after-tax discount rate, instead of \$1 billion) because those portions of the cost that are pretended not to be due for a century are worth a lot less than the upfront expense. Even so, in this dam example the returns are certainly worth the investment (a 10 percent return, well above the economy-wide real after-tax return on capital, or a revenue stream of \$3 billion in present value on a \$1 billion investment). However, a more marginal investment displayed in this manner could appear worthwhile even though it was really losing money.⁹

Another rationale for spreading the cost over the lifetime of the asset is to reflect the decline in the value of the asset over time. This is called *economic depreciation* (more on this later), which is a feature of the *Haig-Simons definition of income* (also more later). Economic depreciation tracks the decline in value of the assets that the business owns and the amount the business might realize if it were to sell them. In that sense, it is an effort to track changes in the value of the firm over time if it had to be liquidated (a change in a balance sheet item), which is not quite the same as current income. Mixing the two concepts can confuse the issues.

How financial accounting for tax liabilities confounds tax policy

The presentation of tax liabilities in financial reports creates an accounting issue that is interfering with fundamental tax reform. The trouble is centered on the entries for *deferred tax liability* in a business's income statement. When the tax code allows the use of accelerated depreciation or expensing to compute taxable income, the business receives a bigger deduction early in the asset's life and a smaller one later. It pays less tax in the early years and more in the later years than under straight line accounting.

⁸ This tendency to smooth earnings in publicly traded companies is well documented in the finance literature. See, e.g., Drew Fudenberg & Jean Tirole, On income smoothing: A theory of income and dividend smoothing based on incumbency rents, 103 JOURNAL OF POLITICAL ECONOMY 75-93 (1995).

⁹ A tendency of some managers of publicly traded companies to make a less than optimal business decision, either because they are misguided by the distorted accounting presentation or because it makes them look better in the shareholders' eyes, is part of a class of behaviors known in the finance literature as "managerial myopia." See, e.g., Jeremy C. Stein, Efficient Capital Markets, Inefficient Firms: A Model of Myopic Corporate Behavior, 104 QUARTERLY JOURNAL OF ECONOMICS 655-669 (1989).

This increases the value of the business's cash flow and means a higher return on the investment.

The accounting profession, however, assumes straight line depreciation as the norm for tax purposes. Accountants require that businesses report an offset to the reduction in current taxes from accelerated cost recovery as a deferred tax liability of equal dollar amount. The intent is to make clear that there will be higher taxes due later. However, in requiring an equal dollar offset, the accountants fail to discount the deferred tax liability to reflect the benefits of delaying the tax (again ignoring the time value of money).

Thus, even though the present value of the business's cash flow is in fact enhanced by the accelerated depreciation, that benefit is masked in the presentation of its book profit in the financial report. The value does not show up as an increase in the business's highly visible bottom line (current net income) in the financial statement. The business has less good news to share with the shareholders, at least in the headlines, and explaining the issue may require an extended footnote. That may explain why some CEOs place less value on accelerated depreciation than it merits.

The presentation of a tax rate cut is a far different matter. When a corporate or non-corporate business tax rate reduction is enacted, the benefits to the business are reported at once on its bottom line as a rise in after-tax income. In addition, all accumulated deferred tax liabilities on the business's books from current or previous years are suddenly marked down to reflect the lower future tax. That mark-down of future taxes is reported as an immediate increase in income in the year the tax rate is cut even though the business has not yet realized the extra after-tax revenue (another confusion of income and balance sheet items). Management may bask in the glow of an apparently great year that really wasn't, for which their expertise was not responsible. In this way, the accounting convention exaggerates the benefit of a rate reduction while masking the benefit of cost recovery acceleration of identical or greater value.

The distortion of the value of earnings due to tax depreciation is one reason why some financial reports include cash flow figures for the business. Cash flow accurately reflects the earnings of the business, whether due to changes in sales, depreciation, tax rates, investment, and all other costs, and more fully informs the shareholders

of the real situation. Stock analysts are trained in business school to use this cash flow information to value the company.¹⁰ The analysts know to examine the nature and quality of the earnings, not just the headline number. Neither they nor the shareholders are ultimately fooled by the accounting misdirection. The level of the firm's stock price is not affected, at least not for long.

Potential lenders to a business are primarily interested in its ability to repay its borrowing. That is a function of cash flow, not financial reporting income. Lenders look beyond accounting income to the underlying cash situation. Similarly, potential investors who might wish to buy stock, or who might wish to buy out the entire company, are more interested in the cash flow. They look beyond book profits before making an offer.

Depreciation for tax calculation purposes

The third area in which capital cost accounting is critical is in calculating a business's tax liability.

Recall that the correct measure of income is revenues less costs of production. A key question in tax policy is whether the costs of capital assets such as plant, equipment, and buildings are to be subtracted from the first revenues received or whether they are to be subtracted from revenues received in the distant future. The former approach fully reflects the cost of the assets. The latter approach does not, because the delay reduces the present value of the cost deductions due to the time value of money. Delayed cost recovery increases the tax burden on investment and reduces capital formation, employment, and the incomes of workers, shareholders, and other owners of businesses.

Historically, tax depreciation schedules have allowed cost recovery that is more or less in line with the expected lives of the assets using either the straight line method (equal annual deductions) or some form of accelerated depreciation (such as the 150 percent declining balance method built into the current Modified Accelerated Cost Recovery System, or MACRS, schedules) that allows more of the write-off in the early years of the asset and less later. In recent years, Congress has allowed temporary periods of partial or full expensing for equipment and some equipment-like structures as counter-cyclical measures.

¹⁰ "Value" means the present value of the estimated future cash flow of the business, either in total or per share.

Modest amounts of expensing are allowed on a permanent basis for small businesses under Section 179 of the tax code. These amounts are capped and are clawed back if investment and revenues exceed certain thresholds. Businesses below the thresholds have an incentive to add to their capital. Businesses at or above the caps and claw-back regions have no added incentive “at the margin” to acquire a larger total stock of assets

A very brief history of tax depreciation

The corporate income tax was imposed in 1909, and the individual income tax followed in 1913. At the time, businesses were allowed to depreciate their assets any way they deemed reasonable. Little was known about how fast assets really wore out or became obsolete. There was a study done by Robley Winfrey of the Iowa Engineering Experimentation Station in 1935 on the rate of decay of telephone and telegraph poles, railroad ties, and other assets.¹¹ It showed a geometric decay rate for many assets, with a fairly rapid decline in soundness with some lingering outliers lasting a protracted period. This became the rationale for such depreciation methods as double declining balance, in which the bulk of the cost of an asset was written off in the first few years and the small residual amounts later on. Hanging one’s accounting hat on a telegraph pole is a bit of a stretch. One might question if an electric turbine, the Empire State Building, or a delivery van ought to be treated like a telegraph pole or simply acknowledge that any depreciation schedule is entirely arbitrary and non-scientific. Nonetheless, the Bulletin F lives adopted in 1942, which first formalized the write-off patterns for tax purposes, included double declining balance for equipment and structures.

From the 1950s to the early 1980s, tax depreciation tended to become more generous, that is, moving to shorter asset lives that gave deductions closer in present value to the full cost of the assets. The tax system moved from the Bulletin F lives in place from World War II through the Eisenhower years, to the shorter Guideline lives with double declining balance under Kennedy (augmented by an investment tax credit, or ITC), to the still shorter Asset

Depreciation Range (ADR) under Nixon. The 1981 Economic Recovery Tax Act (ERTA) under Reagan introduced the Accelerated Cost Recovery System (ACRS) for equipment, reduced lives for buildings, and provided a larger ITC. ACRS moved initially to 150 percent declining balance to cushion the short run budget impact of ERTA, pledging to restore 175 percent declining balance in 1984 and 200 percent (double) declining balance in 1985.

Deficit concerns in the Reagan years led Congress to partially reverse the shorter ACRS lives for equipment and freeze 150 percent declining balance in the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA); to increase the lives for buildings in the Deficit Reduction Act of 1984 (DEFRA); and to eliminate the ITC and further lengthen lives for equipment and structures in the Modified ACRS system (MACRS) enacted in the Tax Reform Act of 1986 (TRA86). The present values of the cost recovery in MACRS are lower than under ACRS but higher than those of the preceding ADR. These reversals slowed investment and economic growth after 1986 and were revenue losers after all economic adjustments.¹² As such, they were neither equitable, fiscally responsible, deficit-reducing, nor true reforms.

MACRS remains the basic depreciation regime today. However, from September 11, 2001 to the end of 2005, and again from 2008 to 2013, Congress allowed partial expensing equal to 30 percent, 50 percent, or even 100 percent of equipment and software spending as temporary anti-recession measures. These brief periods of temporary expensing serve mainly to shift replacement investment forward from a later quarter or year. If it cannot be counted on to last, the transitory expensing will not give business the confidence to enlarge the capital stock on a permanent basis.

Table 1 shows the present values of the write-offs for equipment, non-residential structures (fences, barns, silos, etc.), and residential structures under historical depreciation regimes. The values are shown as a percent of the outlay. The closer the value is to 100 percent, the closer the write-off is to immediate expensing and to the full cost of the asset. The calculations assume a discount rate reflecting a roughly 3.5 percent real after-tax return plus about 2 percent annual inflation.

¹¹ Robley Winfrey, Statistical analysis of industrial property retirements, Bulletin 125, Iowa Engineering experiment station (1935). For a discussion of the Winfrey distributions, see Organization for Economic Co-Operation and Development, Measuring Capital - OECD Manual 2009 (OECD Publishing, 2009) at 116, <http://www.oecd.org/std/productivity-stats/43734711.pdf>.

¹² Stephen J. Entin, The Reagan Era Tax Policies, IRET POLICY BULLETIN NO. 102 (Nov. 11, 2011), Tables 9 & 10, <http://iret.org/pub/BLTN-102.PDF>.

How depreciation understates the cost of investment for tax purposes

Competitive investments barely earn back their costs plus about a 3 percent to 3.5 percent annual real return (after taxes and inflation) over their lives. In present value, at that roughly 3.5 percent discount rate, the return just makes the earnings stream equal to the upfront cost of the asset and the asset barely affordable. Economists call such a return a *normal profit*. It equals the marginal rate of time preference at which people

are just willing to trade current consumption for risk-free saving and investment. Normal profit ought to be considered a cost of doing business. It is not net income in a present value or psychological sense. Investments may earn higher returns due to risk, patents, copyrights, brand loyalty, or some form of market power. These higher returns are called *quasi-rents*, *real economic profits*, or *super-normal profits*.

Immediately expensing an asset for tax purposes saves the firm an amount of tax equal to the tax rate times the acquisition cost of the asset.

Table I. Present Value of Capital Consumption Allowances (as percent of cost)

	Corporate	Non-corporate	In Effect:
MACRS - 100% Bonus Expensing			
Equipment & software	100.00%	100.00%	•09/09/2010 – 12/31/2011 (for equipment and some elements of structures)
Nonresidential structures	63.32%	64.18%	
Residential structures	51.32%	48.89%	
MACRS - 50% Bonus Expensing			
Equipment & software	93.74%	93.24%	•01/01/2012 – •01/01/2008 – 12/31/2009 •05/06/2003 – 12/31/2005 (for equipment and some elements of structures)
Nonresidential structures	57.13%	57.10%	
Residential structures	51.17%	48.70%	
MACRS - 30% Bonus Expensing			
Equipment & software	91.24%	90.54%	•09/11/2001 – 09/10/2004 (for equipment and some elements of structures)
Nonresidential structures	54.65%	54.27%	
Residential structures	51.10%	48.63%	
MACRS			
Equipment & software	86.84%	86.48%	•1987-present (recovery period for certain structures lengthened in 1993Q2)
Nonresidential structures	50.93%	50.02%	
Residential structures	51.01%	48.52%	
ACRS			
Equipment & software	87.21%	87.49%	•1981-1986 (recovery period for certain structures lengthened in 1984Q3 and 1985Q2)
Nonresidential structures	73.74%	71.59%	
Residential structures	72.29%	70.76%	
ADR			
Equipment & software	83.34%	84.29%	•1971-1980
Nonresidential structures	49.94%	50.13%	
Residential structures	42.73%	41.72%	
Guideline Lives			
Equipment & software	79.82%	80.81%	7/13/1962 – 1970 Revenue Procedure 62-21, 1962-2 C.B. 418, superseded Bulletin F
Nonresidential structures	51.09%	50.87%	
Residential structures	47.97%	46.95%	
Bulletin F			
Equipment & software	73.60%	73.75%	1942 - 7/12/1962 Bulletin F (IRS Publication No. 173)
Nonresidential structures	46.10%	42.48%	
Residential structures	41.23%	40.49%	

The market cost of an asset is generally just equal to its value in ordinary uses. Expensing therefore offsets only an amount of future taxes that would be owed if the asset were barely earning a competitive return.

Expensing the cost of assets does not shelter from tax any higher returns, or quasi-rents, stemming from other aspects of the firm. These returns in excess of cost ought to be taxable income and are treated as such under expensing. Quasi-rents constitute a large portion of economy-wide profits year after year and generate a large portion of business tax revenue. That such profits are higher than in run-of-the-mill industries and are called “real economic profits” or “super-normal profits” does not mean they can be taxed with impunity.

Some recent theories suggest that taxing such real economic profits at high rates after allowing expensing does not discourage the activities associated with them. That is unfounded. Many activities that lead to high profits are difficult and risky and would wilt under punitive tax rates. Innovation and product improvement are motivated in large part by the desire for higher-than-normal profits and quasi-rents. These quasi-rents are eventually competed away as rivals catch up, spurring additional efforts to stay ahead of the pack by creating new quasi-rents. Lower corporate and individual income taxes can spur incentives for investment and research by lowering the tax burden on these profits. Lower corporate tax rates and individual tax rates on pass-through entities, on income properly measured via expensing, would be a powerful incentive for growth.

By contrast with expensing, depreciation protects a smaller amount of revenue, in present

value, from tax. The delayed write-offs are equal to the full nominal amount of the outlay, but the delay makes their present value less than the nominal cost. Depreciation delays the tax savings, causing the amount of tax saved to be less in present value than the tax collected on the subsequent revenues. In effect, part of what the investor experiences as costs is subject to tax. This will alter investment behavior by reducing the rate of return on the investment. Any business planner with an MBA, or any other investor with a sense of the time value of money, will respond by reducing investment in assets that cannot earn enough to counter the higher tax.

A small delay in recovering costs, or the presence of inflation, can grossly overstate income and raise taxes, thereby reducing after-tax earnings below what is required to make an investment worth doing. Chart 1 shows how the present values of depreciation allowances vary according to the length of the asset life and the rate of inflation. The chart assumes a 3.5 percent real discount rate and shows that:

- A machine that costs \$1, and is expensed immediately, gets a write-off worth \$1, eliminating the tax on an amount of revenue equal to its cost.
- The same asset written off over seven years under MACRS, with no inflation, gets a write-off worth \$0.91 in present value. The remainder, \$0.09 of its revenue, is incorrectly labeled as income and subjected to tax, when it is really just covering a cost; at a 35 percent tax rate, the tax is overstated by about \$0.03.
- At 3 percent inflation, the real value of the write-off falls to \$0.85, overstating income subject to tax by \$0.15 and the tax by about \$0.05.

Chart 1. Present Value of Current Law Capital Consumption Allowances per Dollar of Investment Compared to Expensing (First-Year Write-Off)

Asset lives (in years):		3	5	7	10	15	20	27.5	39
Present value of first-year write-off of \$1 of investment:		\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
Present value of MACRS write-off of \$1 if inflation rate is:	0%	\$0.96	\$0.94	\$0.91	\$0.88	\$0.80	\$0.74	\$0.65	\$0.55
	3%	\$0.94	\$0.89	\$0.85	\$0.79	\$0.67	\$0.59	\$0.47	\$0.37
	5%	\$0.92	\$0.86	\$0.81	\$0.74	\$0.60	\$0.52	\$0.39	\$0.30

Assumes a 3.5 percent real discount rate, 3-20 year assets placed in service in first quarter of the year, 27.5-39 year assets placed in service in January.

• A factory or office building that is written off over 39 years (the required life under MACRS) gets a deduction worth only \$0.30 on the dollar if inflation is 5 percent. The building's income subject to tax is overstated by \$0.70 and its tax by \$0.245. The longer the asset life, and the higher the rate of inflation, the more the income and the tax are overstated.

Even a modest asset life and small amount of inflation can have a major effect on the after-tax rate of return. In Chart 2, we examine in detail the effect on the seven year asset in Chart 1, assuming 3 percent inflation. Assume an asset costing \$100 generates revenues of \$115 over its lifetime in present value for a net income of \$15 in present value. For simplicity, also assume a tax rate of one-third. If expensing were allowed, the business would pay a tax of \$5 in present value on the \$15 of income, leaving the business with \$10 in after-tax present value income. However, the imposition of depreciation instead of expensing reduces the present value of the cost recovery write-off from \$100 to \$85. That doubles the taxable income of the business to \$30 in present value (\$115 less \$85), doubles the value of the tax to \$10 in present value, and halves the return on the asset to 5% in present value. Far fewer assets will be purchased than under expensing.

As another example, assume this \$100 asset is the 39-year building described in Chart 1, with a write-off worth only \$30 in present value at 5 percent inflation. The owner would pay tax on \$85 of the building's assumed \$115 present value revenue and owe \$28.33 in tax. That exceeds the building's real income of \$15 (\$115-\$100 in real cost). It would lose \$13.33 and would not

be affordable. It would need revenue of \$135 to break even after-tax and \$150 to get a 10 percent return after-tax. Far fewer buildings would be built than under expensing.

Effects on government revenue

The government receives tax revenue sooner from any business activity if it mandates depreciation rather than expensing for tax calculations or if it shifts from shorter to longer depreciation lives. Costs are deferred, taxable income is shifted forward, and tax revenue is shifted forward. There is a permanent gain to the government in present value but a loss to the taxpayers. On an annual budget basis, however, the gains are temporary.

Costs disallowed this year are allowed in a future year. Consider a firm employing five machines costing \$100 each, replacing one machine a year. (See Graph 2.) Under expensing, it has been deducting \$100 a year for cost recovery, saving \$35 in tax at a 35 percent tax rate. Now assume the government requires it to switch to straight line depreciation. The machines bought under the new system will be allowed a \$20 write-off each year for five years. The first year, only \$20 for the first replacement machine is deductible, the firm's tax offset falls to \$7, and the government gains \$28 compared to expensing.

In the second year, the tax deduction is \$20 for the second machine replaced, plus another \$20 from the first machine, for a deduction of \$40. The firm's tax offset is \$14, the government gains \$21 compared to expensing. In year three, the cost recovery is \$60, a fifth of three

Chart 2. Expensing Versus Depreciation: Depreciation Overstates Taxable Income and Depresses Returns on Capital (assume a 7 year asset and 3 percent inflation)

Expensing (Full Cost Recovery)		Depreciation	
Revenues from machine, present value	\$115	Revenues from machine, present value	\$115
Full cost of machine	\$100	Full cost of machine	\$100
Full cost write-off for tax purposes(expensing)	\$100	Allowable depreciation write-off, present value	\$85
Real profit equals taxable profit	\$15	Taxable "profit" exceeds real profit	\$30
Tax	\$5	Tax	\$10
After-tax income	\$10	After-tax income	\$5
Rate of return	10%	Rate of return	5%

Graph 2. Switching From Expensing To Straight Line Depreciation At Start Of Year 1 One 5-Year Asset Costing \$100 Bought Each Year



machines. The firm's tax offset is \$21, and the government gains \$14. In year four, the firm deducts \$80, offsets \$28 in tax, and the government gains only \$7. By the fifth year, recovery allowances are back to \$100 (a fifth of five machines), the tax offset is \$35, and the government gains nothing.

It may appear that everything is as it was by the fifth year, with no lasting gain to the government and no lasting loss to the business. This is not correct. Barring other changes, the government will have a lower level of debt (if it did not spend the added revenue) and be paying less interest. But the business will have incurred more debt (if it kept up the five machines) or will have banked or distributed less after-tax income. More important, each new replacement machine will now be a less attractive investment. It will earn less in present value than before, because its after-tax income will be less in its first year and more of its after-tax income will be shifted to later years.

Shifting the asset's after-tax income further out reduces its present value and lowers the rate of return on the asset. If the business responds to the lower rate of return by reducing the number of machines from five to four, its income will be lower, the wages of the employee who ran the fifth machine will be lost, and the government will have less tax revenue from those sources. If people respond to after-tax incentives, and adjust their behavior accordingly, the two states of the world will be very different.

Moving from expensing to depreciation has the effect of forcing the private sector to make an

interest free loan to the government via accelerated tax payments. The government can borrow more cheaply than the private sector. If either must take the hit, it is cheaper for the government to do so. However, the government is eager to get revenue sooner rather than later, at minimal cost to its own budget.

Accelerated tax payments generally go to fund additional government consumption or transfer payments at the expense of private sector investment. That trade reduces national output and income. Each dollar invested in the private sector may yield society on average about a 6 percent real return (roughly the pre-tax return on capital net of inflation). This return far exceeds the marginal rate of time preference. In the absence of government, it would encourage very high levels of investment and growth. This investment would be worth far more than most current government consumption. Unfortunately, the government's time preference is at odds with society's. It will not curb its own spending to "invest" in an expanded economy by enabling increased private sector investment in a larger capital stock.

Moving in the other direction, from long asset lives to shorter ones, or to expensing, reverses the analysis. (See Graph 3.) The government has short-term budget losses as more cost recovery is allowed in the first years. However, recovery allowances taken immediately are then not available in later years. As time passes, assets of various lives that are still being written off gradually under old law will vanish and their carry-over allowances will disappear. Cost recovery write-offs will decline to a lower steady state.

Revenues will return to normal. However, each new asset will be more attractive and have a higher rate of return. The capital stock as well as private sector incomes and wages will rise, and revenues will improve. At the present time, after several years of partial expensing, the government has borne much of the transition cost to faster write-offs. If it decides to extend the partial expensing provision now in force, it would not notice a sharp drop in receipts from current levels.

A modest adjustment must be made to account for the normal growth of the capital stock over time. For example, moving to longer lives has a residual revenue gain in the static sense because investment normally grows over time. Each year's investment is larger than that of the year before. The deferred write-offs from the smaller investment amounts of years past that are now coming due will be a bit less than the delayed write-offs for this year's investments, raising taxable income this year by a small amount. A small static gain will continue if investment keeps rising. Going to faster write-offs has the opposite effect. The added tax relief for this year's investment will be larger than the tax relief no longer being given on older assets. These effects are dwarfed by the growth effects of the additional capital formation made possible by shorter asset lives.

Economic depreciation

Many public finance economists try to justify lengthy depreciation lives on the basis of economic depreciation. Economic depreciation is a measure of the decline in value of an asset from one year to the next. Assets may physically wear out over time or, more likely, become economically obsolete. Either way, the values of their expected future production and earnings diminish as time goes by. Their resale values drop accordingly, because the current value of an asset equals the present value of its future (after-tax) earnings.

Economic depreciation is a concept much emphasized in public finance theory in the economics departments of universities. It fits in nicely with the concept of net national product in the national income and product accounts of the Commerce Department (displaying GDP and its components). Economic depreciation is also especially favored by devotees of the *Haig-Simons concept of income*, which defines income as *the change in the ability to consume*. (More on Haig-Simons in the next section.) In theory, a business could sell its assets and recover the remaining value, and use that to pay a dividend for the shareholders to consume.

Of course, businesses do not normally sell their assets every year to engage in consumption. Their money remains locked up in their production assets as long as they are economically useful. Employing economic depreciation for tax

Graph 3. Switching From Straight Line Depreciation To Expensing At Start Of Year 1
One 5-Year Asset Costing \$100 Bought Each Year



purposes ignores the time value of money and the opportunity cost of these funds. If economic depreciation could be calculated and employed in a perfectly uniform manner, it would still lead to an understatement of cost and an overstatement of income compared to expensing, imposing a penalty for saving and investing instead of consuming one's income.

In practice, economic depreciation is impossible for the Treasury to predict and to set rules for. A lathe for turning metal may wear out faster than a lathe for turning wood. A wood lathe wears out faster in a shop operating three shifts a day than in one with one shift. A conveyor belt in a coal mine wears out faster than a conveyor belt in a fluffy pink bunny slipper factory. Some computer software becomes obsolete in months; other software lasts a few years. Delivery trucks and cabs lose their transmissions faster in hilly San Francisco than in flat Kansas and they rust faster in the Snow Belt with its salt-treated roads than in southern Nevada. The Boeing 777 and Airbus A380 are more fuel efficient than older models. Many 727s and A300s are still flying but are no longer cutting edge. A DC3 may remain airworthy and competitive with alternative forms of transportation in Namibia but not on the Los Angeles to London route.

Nonetheless, Treasury assigns each asset one of a handful of allowable asset lives. Treasury has tried over time to estimate how long equipment and buildings of various types will last on average and has tried to vary the estimates for their use in different industries to be somewhat realistic. But it simply has no way to accommodate all these variations with a few-sizes-fit-all set of rules. The Treasury-set asset lives, and its variations of straight line and declining balance (accelerated) methods, have always been imperfect and have become even more out of line with reality as technology and the composition of the capital stock has changed more rapidly over time. Changes in asset lives always lag reality.

The compromise lives that constitute any depreciation system must be wrong for most assets most of the time. The errors will be constantly changing as inflation rises or falls and as the nature and uses of assets in production varies with time. Consequently, it is impossible for such a system to impose a uniform additional layer of tax on investment.

Even if one could design a tax depreciation schedule to match economic depreciation, it would still make the greater mistake of ignoring the time value of money and the greater distortion between expensing and any longer asset life arrangement. Any depreciation system must distort the mix of capital and output, and reduce GDP, by more than a system in which assets are expensed and the time value of money is clearly recognized as a cost of doing business. There is no point in trying to achieve the impossible and no justification for claiming that an economic depreciation system is economically efficient or ideal. Only expensing (or some close equivalent¹³) can provide an unbiased and economically efficient tax system.

The Haig-Simons theory of income and redistribution

The definition of income for tax purposes that results in the biases against saving and investment in the income tax is based in part on the work of Professors Robert Haig and Henry Simons. They were the godfathers of the income tax back in the second quarter of the 1900s. Their explicitly stated goal was to use the tax system to redistribute income.

Haig and Simons advocated a definition of income that includes income that is saved and the subsequent returns on the saving. Taxing both imparts a basic, fundamental bias against saving compared to consumption that is ingrained in the broad-based income tax. Saving turns a lump sum into a flow of future earnings of equal value. Taxing the future earnings of savings in addition to the original income that was taxed and saved is double taxation. It imposes an extra layer of federal income tax on income that is saved which is not imposed on income used for immediate consumption (except in the case of a few federal excise taxes.) This is the basic income tax bias against saving and investment under the income tax.

The current tax system provides a partial shelter from this anti-saving tax bias in two ways. The first takes the form of tax-deferred pensions and IRAs, in which income used for saving is not taxed until it and its earnings are withdrawn for consumption in later years. The second form of relief is via Roth IRAs, in which income used for saving is taxed immediately, but the earnings are

¹³ One close equivalent is neutral cost recovery, in which write-offs are spread over time, but the deferred amounts are increased each year at a market interest rate to preserve a present value equal to expensing. Adoption of neutral cost recovery would yield many of the benefits of expensing but shift the temporary near-term transition cost for the federal budget from the government to the private sector..

not taxed thereafter. (A similar treatment is given to tax exempt state and local government bonds.) Either method avoids the double tax by acknowledging saving as a cost of earning future income and avoids taxing the basic time value of money, which would otherwise depress saving. Pension and IRA contributions are limited and do not protect all saving against the extra tax.

Investment in physical capital is a form of saving. That is why expensing is consistent with a saving-consumption neutral tax system and depreciation is not. Depreciation imposes a partial double tax on saving in physical capital to the extent that depreciation falls short of deducting the full present value of the asset while taxing the returns.

Haig and Simons chose to tax the earnings of after-tax savings (and to use depreciation instead of expensing) to further their goal of income redistribution and would have regarded pensions as a loophole. Basically, they defined one's income as equal to current consumption plus the increase in one's wealth during the year, whether from new saving or a rise in value of previously acquired assets. This tax base is sometimes described as the increase in the ability to consume. It includes current earnings from labor (wages and salaries), current earnings from assets (profits of non-corporate businesses, interest, dividends, and rents), and any change in the value of assets such as capital gains, whether realized or not. Haig and Simons would have liked to tax capital gains as they accrued, not just when the assets were sold. This latter idea has always been considered impractical, due to difficulties in measuring the value of assets that have not been sold, and it has not been adopted in the income tax.

Taxation of capital gains is a form of double taxation. An asset's current value is the present value of its expected after-tax future earnings. An asset rises in price because its expected future earnings rise. If those earnings come to be, they will be taxed when earned. To also tax as a capital gain the rise in the price, which is just the present value of those future after-tax earnings, would be to double tax the earnings. This is obvious when a corporation retains after-tax income for reinvestment, raising the company's value and the stock price, but it is equally true for capital gains in non-corporate businesses whose expected earnings increase. The deferral of tax on capital gains, and the reduced tax rate on those gains over

most of the history of the income tax, reduce what would otherwise be a punitive double tax.

The treatment of capital cost recovery most in tune with the Haig-Simons concept of income is that of *economic depreciation*, because economic depreciation equals the annual change in value of the assets owned by the business as they age or become economically obsolete. If one could design a depreciation system using economic depreciation, one would have a uniform tax on the Haig-Simons income of all types of assets. Other depreciation methods give assets longer or shorter asset lives than are realistic. This results in smaller or larger cost recovery allowances than their loss of value would warrant. These methods create distortions in the relative rates of return on different assets or on similar assets in different uses. These distortions are in addition to the basic income tax bias against saving and investment. Economic depreciation supposedly avoids these additional distortions among assets but cannot offset the basic bias. For that, one needs expensing. As discussed above, economic depreciation is impossible to calculate and cannot be successfully implemented for tax purposes.

Haig and Simons did not approve of having a corporate income tax in addition to the individual income tax. Even for these redistributionists, the degree of double taxation and damage to investment inherent in an add-on corporate income tax went too far. They would have preferred an integrated tax structure that passed corporate income through to shareholders to be taxed as it was earned. This, too, was regarded as impractical at the time, although today we have mastered the reporting mechanics of "pass-through" businesses such as partnerships and subchapter S corporations.

The Haig-Simons definition of income results in a tax that is not saving-consumption neutral; that is, it falls more heavily on income used for saving than on income used for consumption. Since the rich save more than the poor, taxing saving more heavily than consumption is assumed to be progressive. Simons also favored making the marginal tax rate structure graduated (higher tax rates imposed on incremental taxable income as it exceeds specified levels) to further increase the progressivity of the tax system. He acknowledged that this type of tax system would favor consumption over investment but thought the loss

of GDP was worth the supposed improvement in income distribution.¹⁴

Tax depreciation and inflation

As discussed above, inflation can seriously degrade the value of cost recovery allowances. During the Ford and Carter administrations, the economy underwent two bursts of double digit inflation. The cost recovery allowances became insufficient to pay for replacing capital assets, whose prices had been driven up by inflation. The fixed dollar consumption allowances understated the costs of machines and buildings, and overstated business income. Businesses were reporting taxable income in excess of their real earnings and in many cases were paying taxes when they were actually losing money. Investment, productivity gains, and wages lagged.

In the Carter years, I attended a panel discussion of the economic outlook featuring three speakers: Professor Charles Schultze, then-Chairman of the President's Council of Economic Advisors; the CEO of a major steel company; and the CEO of a large Northeast utility. During Q&A, I asked Dr. Schultze if it would help to correct the depreciation situation if capital consumption allowances were adjusted for inflation to better measure income and reduce the disincentive to invest. He acknowledged the theoretical validity of the approach but said the Carter Administration was too concerned about the short run revenue effect and the deficit to endorse the idea.

At that point, the utility executive interjected, "I don't want replacement cost accounting." The steel CEO asked, "Why ever not?" "Because," said the utility executive, "if my shareholders ever found out that we are really losing money, they'd have my head on a platter." The steel executive sneered and asked, "What happened to your stock price over the last eighteen months?" It had dropped like a rock, and the utility executive's face turned very red. The rest of the room dissolved into laughter. The steel executive's point was that no one was fooled by the inflation-distorted numbers in the financial statement. Those same finance courses in business schools that train people how to plan investments in individual plants and pieces of equipment also instruct future stock analysts. They, too, are taught to use

cash flow projections, not depreciation, to value a whole company. No one is fooled

Accounting for tax losses

Accounting for tax losses is a legitimate reason why accountants and some businesses favor matching outlays to incomes. The tax code limits loss carryforwards to seven years and loss carry backs to three years. If deductions cannot be taken against earnings within that time frame, they are lost. Thus, a start-up company might prefer to delay reporting investment outlays for tax purposes for a number of years until revenues from sales catch up with initial costs. If the business has no other income and tax liability, it cannot get a tax refund by claiming the costs earlier anyway, so it might as well wait. Businesses should have the choice of delaying deductions for cost recovery if they wish. Alternatively, the loss carryforward period should be extended.

Neither step would solve the valuation problem, in that any deferral of losses reduces their value. Although delaying deductions for cost recovery could benefit a business in start-up situations, the delay in taking the write-offs would still result in an added tax burden that would increase the cost of the start-up business. A better solution to the issue of deferred tax losses is to adjust them for the delay by augmenting them by an appropriate interest rate to maintain their present value. This approach was taken in the Hall-Rabushka-Armev Flat Tax. Losses should also be transferrable to acquiring companies without limit. That would improve merger prospects and give faster access by start-ups to the capital that more mature firms might contribute.

Non-depreciable assets and misconstrued costs: inventory, land, and intangibles

Throughout this paper we have been favoring the term "cost recovery" over "depreciation." "Depreciation" or "economic depreciation" suggest that the deduction for investment expenses is related to the asset's loss of value over time and its limited life. *In fact, the real rationale for cost recovery allowances is to acknowledge that income is, and ought to be defined for tax purposes as, revenue less the cost of earning revenue.* With that distinction in mind, consider the tax treatment of

¹⁴ For more on Simons's views on income redistribution via the tax system, see Henry C. Simons, *Personal Income Taxation* (Chicago, Ill.: University of Chicago Press, 1938), p. 18-23.

land, inventories, and other outlays that the current tax system does not allow to be depreciated or expensed, or treats oddly.

Inventory, LIFO and FIFO. Think back to the can of soup in the discussion of the grocery store. Its cost is not deducted when the soup is bought. It is placed in inventory, and its cost is later deducted as “cost of goods sold” when a shopper buys it. This is the treatment accorded all types of inventory, from soup to nuts and bolts, automobiles, homes, grains, minerals; oil, gas, and chemical stocks; and any kind of manufactured product awaiting sale at the primary producer, intermediate processor, wholesaler, or retailer. The cost of goods sold approach disallows an immediate deduction for additions to inventory and thereby ignores the cost of the time value of money on capital tied up in inventory. Ideally, inventory would be expensed when acquired, and the full revenue from the sale would be taxed when received.

Soup and other groceries and perishable medicines do not stay in warehouses or on store shelves very long (one hopes), so the delay in acknowledging their costs does little damage. However, raw materials, intermediate goods, and finished goods of many types may stay in inventory for several quarters or several years. During such time they are susceptible to changes in the cost of replacing them, either due to inflation or changes in market prices. For example, a failure of this year’s corn crop would drive up prices, including the value of any corn stocks left over from last year’s harvest. The OPEC oil embargos and production cutbacks of the 1970s raised the cost of oil regardless of when or where it was produced.

Businesses may account for inventory in two ways: first-in-first-out (FIFO) or last-in-first-out (LIFO). Under FIFO, a unit of inventory sold today is assumed to be the first unit of inventory acquired, and the cost claimed for it is the price paid in the more distant past for that unit. Under LIFO, an item of inventory sold today is assumed to be the last item of inventory acquired, and the cost claimed for it is the price paid for that more recently acquired unit. At zero inflation and

stable relative prices the two are equivalent. If the cost of the inventory is rising or falling, however, LIFO gives a better representation of the value of the items currently being sold than FIFO. When prices are rising, businesses would prefer LIFO. FIFO would understate costs more and result in more taxes on phantom profits. In the case of falling prices, businesses would prefer FIFO. FIFO would register more of a loss on the inventory than LIFO and save on taxes. Both methods result in higher taxes than if inventory were expensed. With expensing, the accounting issue would become moot, and the tax system would no longer penalize inventory holdings by taxing the cost of carrying inventory.

Land. Land does not have a limited life.¹⁵ It is not given a cost recovery allowance. When it is sold, the purchase price is subtracted from the sales price, and only the capital gain (or loss) enters taxable income. Although the cost of the land is ultimately deducted in this manner, the buyer is forced to wait until the land is sold to recover his cost of purchase. The purchase cost is not even adjusted for inflation, let alone a positive real interest rate.¹⁶ This is the most flagrant disregard for the time value of money in the tax system.

It may be years, or generations, before the land is sold. In the case of inherited property, there is a step-up in basis for the heir, which can compensate for the lack of expensing, but the land may be subject to the estate and gift tax. In an ideal cash flow tax, land costs for business investment would be expensed when incurred, and the full amount of a land sale would be taxable. Expensing and repeal of the estate tax would end the need to step up the tax basis for inherited property.¹⁷

Intangibles. The tax system treats intangible capital in odd and arbitrary ways. Rights and royalties receive different treatments. Royalties are paid over time to the holder of a patent or copyright as the products that are licensed to use them are sold. These payments are expensed as they are paid. Intangible assets are assets that are not physical in nature, such as goodwill and going concern value acquired when buying a business;

¹⁵ Admittedly, land can be worn out or suffer from erosion if a farmer fails to fertilize or manage run-off properly, or undermined by prairie dogs, or rendered worthless by the discovery of an endangered snail. Its earnings potential can be crippled or enhanced by a zoning change. It can be polluted by chemical spills. It may someday sink under the ocean if a volcano or earthquake or global warming does its worst. These oddities are not the situations on which to base a tax code.

¹⁶ Land does not always rise in value, as housing developers found to their cost in the recent bubble and in the S&L debacle of the 1980s, and as farmers learned in the land price collapse of the 1980s.

¹⁷ In a practical cash flow tax, a home purchase would not be expensed because the imputed rent on the home (its “return”) is not taxed, and its sale would not be taxed because it was bought with after-tax money and no expensing or depreciation was allowed. This is akin to neutral Roth IRA treatment of saving.

outright purchase of a patent, copyright, formula, or design; franchise name; consumer-based assets such as customer lists, special skills of the existing workforce, books, records, and information bases; and others. These are governed by Section 197 of the tax code. Section 197 intangible assets acquired through the purchase of a business are paid up front, but must be depreciated over fifteen years rather than expensed.

Sometimes the tax rules recharacterize activities that are usually expensed as outlays that must be amortized over time. Wages, salaries, and materials are expensed in most uses in most industries. Land improvements are generally not expensed, even when they are mainly due to the cost of labor. Irrigation improvements or the draining of a swamp are two examples. They are viewed as capital assets. The same practice applies to the building of a factory or a machine by a business for its own use. Even if built by its own employees, the costs, including the wages and materials, are treated as a capital investment and depreciated over time. The reasoning in all these cases is that if a company buys a capital asset such as an earth mover or computer from another firm it must depreciate it, so why not force the company that builds its own capital asset to depreciate it as well? As with any other investment, the delay in accounting for these upfront costs makes the activities more costly and less rewarding.

Intangible drilling expenses create another form of intangible asset: an oil or gas well. The well is intangible in the sense that its value cannot be transferred, that is, it cannot be moved or converted to another use. Intangible drilling expenses in the oil and gas industry are mainly wages and salaries of the drillers and the cost of the fuel and materials consumed in drilling the wells. Independent oil and gas producers may expense them on a cash flow basis; the integrated major producers may expense 70 percent of the intangible costs but must amortize the remaining 30 percent over a five year period. These rules discriminate between large and small energy developers, which has no economic merit. Nonetheless, the energy industry gets some relief for these costs in that they are not treated entirely as capital assets. The problem is not that the oil and gas intangibles are treated too favorably; the problem is that other investments are treated too harshly by the current tax system. All businesses should get the same treatment—expensing of costs.

Geophysical and geological costs of exploring for oil and gas are incurred up front but must be amortized over two years for independents and over seven years for major integrated companies. That is better than amortizing them over the full life of the wells, but it falls short of expensing.

Mineral and oil and gas producers incur royalty payments and the purchase of mineral rights in connection with their exploration efforts. The royalty payments are only made over time as the production occurs and are effectively deducted when made. The mineral right purchases—sometimes called bonus payments—are up front outlays but must nonetheless be deducted for tax purposes over the expected life of the wells or mines.

Except as noted below for integrated oil and gas taxpayers, all mineral producers, including metals, coal, and oil and gas, are allowed a depletion deduction or allowance, calculated under two methods, cost or percentage depletion. Cost depletion, which is akin to depreciation of capital assets, is claimed on a “unit of production” basis as the deposit or reservoir is reduced by extraction. Percentage depletion is allowed as a percent of the sales value of the mineral or petroleum product. Firms may claim a depletion deduction for any year based upon whichever type of depletion is larger for the year. (The integrated oil and gas producers cannot claim percentage depletion, only cost depletion, and other oil and gas producers are limited to claiming percentage depletion on 1,000 barrels per day of production. All other mineral producers may claim percentage depletion on 100 percent of their production).

Some commentators and tax theorists describe the percentage depletion allowances for mineral producers and oil and gas producers as a tax break, since unlike cost depletion, the cumulative amount of percentage depletion is not limited to a cost recovery equal to the investment in the property. However, these adjustments may be rationalized as an awkward form of compensation for the adverse tax treatment of non-expensed

intangible drilling expenses and time-delayed, amortized costs of acquiring mineral rights.¹⁸ A better approach would be to let the industry expense all of its production costs as they occur. In a cash flow tax, everything would be expensed, including land purchases, land improvements, inventories, mineral rights, and self-manufactured assets, including gas and oil wells.

Conclusion

Our tax masters prefer depreciation to expensing mainly because it appears to bring in more tax revenue sooner. Money makes the world of government go 'round. Politicians appear to have a higher discount rate than the private sector. Whether at the federal or state level, governments want their money NOW! That is unfortunate, because money left in the private sector for saving and investment normally generates a pre-tax return, after inflation, of above 6 percent, which is well above the rate of time preference and would provide an expansion of the economy that the public would consider well worth postponing consumption to achieve. That includes the consumption of most government goods and services.

A more neutral tax base, combined with lower tax rates, would be a powerful engine for economic growth. Labor costs are expensed. Capital costs are not. Fixing the distortion in the tax base by moving toward expensing of capital outlays would redress some of the punitive treatment current law imposes on capital-intensive industries and the blue collar jobs they provide. It would end the tax bias against long-lived assets such as plants, commercial buildings, and multi-family housing in favor of short-lived assets or intellectual property. Lower corporate tax rates on the resulting, better-defined income would add a further boost to all types of innovation and expansion. Combined, they would break the economy out of its current sluggish pattern of inadequate investment and job creation.

The distortions in the tax base are as important as the level of the tax rates in determining the ability of businesses to create and employ capital and labor. Both tax issues should be addressed in a positive manner. In a later paper, we will generate numerical estimates of the economic and federal budget changes under various depreciation and expensing regimes.

¹⁸ A portion of the percentage depletion allowance is available to the landowner. The landowner who "sells" mineral rights to the producer often retains a percentage of the production, often in the range of one-eighth of the production. Its retained interest is defined as a "mineral royalty," which the landowner receives over time. These receipts are taxed as ordinary income to the landowner. In substance, however, it can be argued that this is simply a payment to the landowner in partial sale of his original property, which ought to receive capital gains treatment, as it would if the whole property were sold. Even though the property is restored and returned to the landowner after the vein or deposit is tapped out, it is now property without the underground asset. That is gone forever. Percentage depletion is perhaps partial compensation for the ordinary income tax treatment instead of capital gains treatment.



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