Cost of Capital, Investment Decisions and Economic Growth: Implications for Tax Reform

Prepared by
Quantria Strategies, LLC

for the
CRANE Coalition

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Executive Summary

- Empirical evidence indicates that the cost of capital has strong and significant effects on business investment.
- U.S. businesses invested more than $2 trillion in private, non-residential fixed assets in 2013.
- Investment in equipment was the largest (46 percent), followed by investment in intellectual property (32 percent) and structures (22 percent).
- Business investment is the main driver of economic growth and technological advancement.
- Recent proposals to reform our current U.S. tax system will change the cost of capital in important ways.
- In particular, we estimate that the average cost of capital for investment in equipment across all industries will increase by approximately 8.1 percent if accelerated depreciation is eliminated.
- By itself, the repeal of MACRS would result in less business investment and, consequently, economic growth.
- Even if coupled with proposals to lessen the impact of MACRS repeal, such as reducing the corporate tax rate, most studies show that the long-term effects would result in slower economic growth.
- The most widely cited tax reform plan (the Camp Plan) would also increase the cost of capital by altering other business provisions, such as the taxation of research and development expenses (R&D), rules for accounting changes in inventory (LIFO) and the deduction of intellectual property.
- In its analysis of the Camp Tax reform plan, the JCT estimated that, over time, increases in the cost of capital from MACRS repeal would offset any positive effects from a rate reduction.
- A 2007 Treasury study that focused on business competitiveness reported a similar result: little or no effect on long-term economic growth if MACRS repeal were coupled with a corporate rate reduction.
- Increasing the cost of capital today will have long-term, negative economic consequences as businesses adjust to the new tax regime.

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I. Introduction

Capital investment is a fundamental driver of economic growth through both macroeconomic and microeconomic channels. The positive macroeconomic results occur by: increasing aggregate demand, replenishing the existing capital stock, raising productivity, fostering technological innovation, and facilitating job creation. The positive microeconomic results occur by influencing businesses capital investment decisions to increase revenue, profits, and the value of the firm.

History, as a guide, tells us that accelerated cost recovery has been and remains an important feature of the tax code. The presence of this feature, on which most investment relies, is an important aspect of tax planning.[1] Since 1954, tax law recognized this important role by providing numerous incentives to firms to increase capital expenditures, including targeted tax credits, provisions that accelerate cost recovery, deductions for certain production activities and preferential tax rates for certain types of investment income.

Recent proposals to reform our existing corporate income tax will change these incentives in important ways. In particular, proposals to curtail accelerated depreciation for new investment will have widely different effects across industry groups and may have unintended consequences for long term economic growth.[2] In this paper we take a close look at how accelerated depreciation affects the cost of capital faced by firms, how this affects the investment decision, how these incentives might be altered under corporate tax reform and what this might suggest about long-term macroeconomic outcomes.

This analysis begins with a brief review of the literature on the cost of capital to explain how the tax system interacts with the marginal cost of investment. Included in this review is a summary of recent research on the effectiveness of tax policy in influencing investment decisions. Next, we calculate the cost of capital under our present tax system and examine how it varies across industry groups. This analysis highlights the critical role played by existing cost recovery provisions in lowering the threshold that companies use when making investment decisions. We then supplement this analysis with additional calculations that indicate how the cost of capital is likely to change under a corporate tax reform proposal that couples an elimination of accelerated depreciation with a reduced corporate tax rate. Despite the reduced corporate tax rate, the loss of accelerated depreciation means that certain capital-intensive industries face higher cost of

[1] Refer to Appendix B for the historical context of accelerated cost recovery.

[2] In a companion paper, we point out that this change, while designed to increase revenues, is front-loaded, provides little long-term deficit reduction and is imprudent fiscal policy. Refer to *Long Run Revenue Effects of Changes in Cost Recovery Allowances*, Quantria Strategies, LLC, April 2015.

capital under this scenario. The final section provides recent empirical evidence of the potential effects that eliminating accelerated cost recovery would have on long-term economic growth.

II. Cost of Capital: Theory and Evidence

Over the last sixty years, most studies that examined the effect of tax policy on capital investment have used the Hall-Jorgenson (1967) derivation of the cost of capital to measure the effectiveness of the tax system in influencing business investment decisions. In this measure, a firm is assumed to make capital investments over time in order to maximize its value. Hall and Jorgenson refer to the *user cost of capital as:*[3]

$$(r - \pi + \delta)\frac{(1 - k - \tau z)}{(1 - \tau)}. \qquad (1)$$

In this formula:

- r is the net-of-tax rate of return a company requires to attract investors;
- π is the inflation rate on capital goods;
- δ is the rate of economic depreciation
- τ is the statutory corporate tax rate;
- k is the investment credit rate; and
- z is the present value of depreciation deductions.

The term on the right summarizes the effect of taxes on this cost. Their fundamental result is that the firm will invest as long as the marginal cost of the next dollar of investment maximizes the value of the firm.[4]

In Hall and Jorgenson's original paper, which drew from Jorgenson's earlier work (Jorgenson (1963)), they examine the effect on aggregate investment of three actual changes in tax policy: (i) implementation of accelerated depreciation in 1952; (ii) the shortening of asset lives in depreciation guidelines issued in1962; and (iii) the imposition of an investment tax credit in 1962. In all cases the authors found significant effects in aggregate investment from each tax policy.[5]

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[3] Gale and Orszag (2005) point out that, in arriving at this formula, many simplifying assumptions are made with respect to expectations, adjustment costs, asset re-sales, the time pattern of economic depreciation and the marginal cost of new capital goods. Much recent work has relaxed these assumptions.

[4] Notice that in a tax system without an investment tax credit (e.g., under present law in the U.S.) and where immediate expensing of investment is allowed (i.e., z = 1), this term disappears and taxes are irrelevant to the firm's decision.

[5] The shortening of asset lives affected mostly investment in equipment and machinery. Critics of Hall and Jorgenson's results pointed out that it is difficult to distinguish the effects on investment due to tax policy from other causes because of the high degree of correlation among the variables. Over the next twenty years, researchers attempting similar analyses found much smaller effects: taxes appeared to have a very small influence on business investment.

Beginning in the 1990's, economists sharpened their models of investment while still adhering to the original Hall-Jorgenson framework. One thread of this research focused on adjustment costs and how they affect the path of capital accumulation. In addition, more powerful econometric techniques were employed to better identify the causal relationships among variables.

A second thread of this research relied on firm-level data to capture heterogeneity in business investment that aggregate data often obscures. Auerbach (2005) points out that this additional complexity may confound the measurement of the tax effect on business investment. These factors include the distinction between new and used capital, taxation of shareholders and the treatment of debt and equity, asymmetries in the tax law (e.g., the corporate alternative minimum tax (AMT) and the existence of net operating losses (NOLs)) and expectations about future tax law changes.

In measuring the responsiveness of business investment to tax policy changes, most studies calculate the *elasticity* of investment with respect to changes in the user cost of capital.[6] Elasticity of investment is important when measuring the effects that recent proposals to reform the corporate income tax might have on investment across industries and, ultimately, economic growth.[7]

III. Cost of Capital for Investment in Equipment Under Present Law

In comparing how particular industries might be affected by proposals to reform the corporate tax system, we rely on Equation (1) to assess the impact. Equation (1) summarizes how various features of the income tax interact to affect the user cost of capital. In particular, it captures the complex interactions between the corporate tax rate (τ), the present value of depreciation deductions (z) and the investment tax credit (k). This measure can be thought of as the marginal cost of the next dollar of investment.

Table 1 shows investment in non-residential, fixed assets by major industry in 2013, the last year for which data are available.

[6] Technically, the elasticity of investment is the percentage change in investment with respect to the percentage change in the user cost of capital.

[7] For example, an elasticity of -1.0 means that if the user cost of capital is increased by 10 percent, capital investment will decrease by 10 percent.

Table 1. Investment in Private Non-Residential Fixed Assets, By Major Industry Group: 2013 *(in millions of dollars)*					
NAICS	**Industry**	**Equipment**	**Structures**	**Intellectual Property Products**	**Total Investment**
11	Agriculture, forestry, fishing, and hunting	42,574	6,995	245	49,814
21	Mining	40,001	149,534	3,741	193,276
22	Utilities	49,402	56,522	3,997	109,921
23	Construction	38,185	1,306	1,219	40,710
31-33	Manufacturing	159,078	29,447	245,402	433,927
42	Wholesale trade	50,786	8,632	30,505	89,923
44-45	Retail trade	48,202	18,122	15,457	81,781
48-49	Transportation and warehousing	62,548	25,930	3,643	92,121
51	Information	79,384	23,483	132,559	235,426
52	Finance and insurance	94,724	12,774	48,705	156,203
53	Real estate and rental and leasing	85,749	31,164	2,486	119,399
54	Professional, scientific, and technical services	32,765	6,826	71,617	111,208
55	Management of companies and enterprises	9,149	4,358	31,966	45,473
56	Administrative and waste management services	21,453	2,119	17,603	41,175
61	Educational services	9,140	14,557	9,259	32,956
62	Health care and social assistance	73,053	34,959	11,274	119,286
71	Arts, entertainment, and recreation	7,087	7,385	8,992	23,464
72	Accommodation and food services	20,609	12,037	795	33,441
81	Other services, except government	13,554	6,961	7,654	28,169
Total, All Industries		**937,443**	**453,111**	**647,119**	**2,037,673**
Percent of total investment		46.0%	22.2%	31.8%	100.0%
Source: Bureau of Economic Analysis (BEA).					

In 2013, businesses in the U.S. made investments of slightly over $2.0 trillion. Close to half of this total represented investment in machinery and equipment and about one-third in intellectual property assets. Investment in structures represents the smallest component of investment at about 22 percent.

Table 2 below shows the percentage distribution of investment in private, non-residential fixed assets, by major industry in 2013.

Table 2. Total Investment in Private Non-Residential Fixed Assets, By Major Industry Group: 2013			
NAICS	**Industry**	**Total Investment**	**Percent**
11	Agriculture, forestry, fishing, and hunting	49,814	2.4%
21	Mining	193,276	9.5%
22	Utilities	109,921	5.4%
23	Construction	40,710	2.0%
31-33	Manufacturing	433,927	21.3%
42	Wholesale trade	89,923	4.4%
44-45	Retail trade	81,781	4.0%
48-49	Transportation and warehousing	92,121	4.5%
51	Information	235,426	11.6%
52	Finance and insurance	156,203	7.7%
53	Real estate and rental and leasing	119,399	5.9%
54	Professional, scientific, and technical services	111,208	5.5%
55	Management of companies and enterprises	45,473	2.2%
56	Administrative and waste management services	41,175	2.0%
61	Educational services	32,956	1.6%
62	Health care and social assistance	119,286	5.9%
71	Arts, entertainment, and recreation	23,464	1.2%
72	Accommodation and food services	33,441	1.6%
81	Other services, except government	28,169	1.4%
Total, All Industries		**2,037,673**	**100.0%**
Source: Bureau of Economic Analysis (BEA).			

Table 3 below shows the percentage distribution of total investment by industry, across equipment, structures and intellectual property.

Table 3. Percent Distribution of Investment in Private Non-Residential Fixed Assets, By Asset Type and Major Industry Group: 2013					
NAICS	**Industry**	**Equipment**	**Structures**	**Intellectual Property Products**	**Total Investment**
11	Agriculture, forestry, fishing, and hunting	4.5%	1.5%	0.0%	2.4%
21	Mining	4.3%	33.0%	0.6%	9.5%
22	Utilities	5.3%	12.5%	0.6%	5.4%
23	Construction	4.1%	0.3%	0.2%	2.0%
31-33	Manufacturing	17.0%	6.5%	37.9%	21.3%
42	Wholesale trade	5.4%	1.9%	4.7%	4.4%
44-45	Retail trade	5.1%	4.0%	2.4%	4.0%
48-49	Transportation and warehousing	6.7%	5.7%	0.6%	4.5%
51	Information	8.5%	5.2%	20.5%	11.6%
52	Finance and insurance	10.1%	2.8%	7.5%	7.7%
53	Real estate and rental and leasing	9.1%	6.9%	0.4%	5.9%
54	Professional, scientific, and technical services	3.5%	1.5%	11.1%	5.5%
55	Management of companies and enterprises	1.0%	1.0%	4.9%	2.2%
56	Administrative and waste management services	2.3%	0.5%	2.7%	2.0%
61	Educational services	1.0%	3.2%	1.4%	1.6%
62	Health care and social assistance	7.8%	7.7%	1.7%	5.9%
71	Arts, entertainment, and recreation	0.8%	1.6%	1.4%	1.2%
72	Accommodation and food services	2.2%	2.7%	0.1%	1.6%
81	Other services, except government	1.4%	1.5%	1.2%	1.4%
Total, All Industries		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Source: Bureau of Economic Analysis (BEA).					

In this study, we focus on investment in equipment since recent proposed changes in accelerated depreciation apply primarily to equipment. Just how a particular industry will fare under a tax reform regime that lengthens the cost recovery period will depend on the asset mix and the corresponding depreciation method used for each type of property. Table 4 shows our estimates of the cost of capital for investment in equipment, by industry, for each industry group. In arriving at these estimates, we use a statutory corporate tax rate (τ) of 35 percent, a required rate of return (r) of 6 percent, a rate of inflation for capital assets (π) of 2.5 percent. Estimates of the rate of economic depreciation (δ) are obtained from the Bureau of Economic Analysis (BEA). (We set the

investment tax credit rate (k) to zero as under present law.) A more detailed description of our model appears in Appendix A.

These figures represent the net cost of capital. We calculate that the average cost of capital across all industry groups is 4.22 percent.

Table 4. Cost of Capital for Investment in Equipment, Under Present Law

NAICS	Industry	Cost of Capital
11	Agriculture, forestry, fishing, and hunting	4.18%
21	Mining	4.08%
22	Utilities	4.29%
23	Construction	3.96%
31-33	Manufacturing	4.06%
42	Wholesale trade	4.16%
44-45	Retail trade	4.22%
48-49	Transportation and warehousing	4.10%
51	Information	4.83%
52	Finance and insurance	4.22%
53	Real estate and rental and leasing	4.11%
54	Professional, scientific, and technical services	4.35%
55	Management of companies and enterprises	4.33%
56	Administrative and waste management services	4.25%
61	Educational services	4.32%
62	Health care and social assistance	4.24%
71	Arts, entertainment, and recreation	4.21%
72	Accommodation and food services	4.12%
81	Other services, except government	4.19%
Total, All Industries		**4.22%**
Source: Quantria Strategies, LLC		

IV. Cost of Capital by Industry Under Repeal of Accelerated Depreciation for Equipment

In this section we examine how the cost of capital would change under the repeal of accelerated depreciation (MACRS).[8] Table 5 indicates that that change would raise the industry-wide cost of capital by about 8 percent.

[8] We assume that MACRS is replaced with the Alternative Depreciation System (ADS). Generally, ADS lengthens the recovery period for most assets and eliminates accelerated depreciation.

Table 5. Cost of Capital for Investment in Equipment, With Repeal of MACRS			
NAICS	**Industry**	**Cost of Capital After Repeal of MACRS**	**Change from Present Law**
11	Agriculture, forestry, fishing, and hunting	4.43%	5.98%
21	Mining	4.53%	11.03%
22	Utilities	4.84%	12.82%
23	Construction	4.14%	4.55%
31-33	Manufacturing	4.51%	11.08%
42	Wholesale trade	4.38%	5.29%
44-45	Retail trade	4.51%	6.87%
48-49	Transportation and warehousing	4.60%	12.20%
51	Information	5.22%	8.07%
52	Finance and insurance	4.50%	6.44%
53	Real estate and rental and leasing	4.35%	5.84%
54	Professional, scientific, and technical services	4.63%	6.44%
55	Management of companies and enterprises	4.62%	6.70%
56	Administrative and waste management services	4.52%	6.35%
61	Educational services	4.55%	5.32%
62	Health care and social assistance	4.45%	4.95%
71	Arts, entertainment, and recreation	4.73%	12.35%
72	Accommodation and food services	4.62%	12.14%
81	Other services, except government	4.71%	12.41%
Total, All Industries		**4.56%**	**8.06%**
Source: Quantria Strategies, LLC			

V. Macroeconomic Effects of Tax Reform on Investment and Economic Growth

Fundamental tax reform typically includes provisions that increase investment and maximize economic growth. Maximizing economic growth typically involves ***reducing tax rates and increasing cost recovery*** to increase investment.

Investment plays a crucial role in long-term growth, as a major contributor to our gross domestic product. The contribution to growth occurs through achieving the optimal level of capital in the productive economy (e.g. desired capital stock). The capital stock contributes to economic productivity (through the marginal product of capital). The theory of investment relies on attaining the desired stock of capital. However, the demand for capital is the level that maximizes net worth (through productivity of capital).

For an investment to be worthwhile, the expected return on capital must exceed the cost of capital. Given limited capital, business investors must choose between competing investment opportunities to maximize the return. In other words, the cost of capital must equal the rate of return that capital could be expected to earn in an alternative investment of equivalent risk. If the cost of capital increases as a result of changes in tax provisions (e.g., repeal of MACRS), this will distort the investment decisions that businesses face.

As the user cost of capital increases, this decreases the demand for capital. In other words, to continue with the same level of investment, businesses would need to get a higher rate of return to offset this increase. Economic research indicates that business taxpayers will respond to increases in the user cost of capital by decreasing investment. Studies conclude that there are significant *substitution* effects (i.e., elasticities) across different types of equipment classes that, when included in the analysis, result in measured elasticities that can be quite large.[9]

As businesses adjust downward their level of investment in response to the increase in the user cost of capital (e.g., repeal of MACRS), the capital stock would begin to erode contributing to lower economic growth and lower output. Increases in cost of capital resulting from MACRS repeal creates incentives that reduce investment and dampen future economic growth.

In addition to maximizing economic growth, the objectives of tax reform often include creating a more efficient and equitable tax system, while maintaining the current level of tax revenues. Unfortunately, these goals often have negative effects on economic growth working in opposition to one another.[10]

The Camp proposal, like most comprehensive tax reform proposals, contains provisions that reduce the cost of capital, as well as provisions that increase the cost of capital. The Camp proposal would reduce the corporate rate, which reduces the cost of capital. At the same time, it repeals MACRS, lengthens the recovery period for research and experimentation expenses,[11] repeals provisions that affect inventory valuation (LIFO),[12] and makes other changes that could increase the overall cost of investment.

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[9] Lui found that, in some cases, the elasticity or behavioral response was above -2.0. In other words, a 1 percent increase in the cost of capital will result in a 2 percent decrease in investment. Hassett and Hubbard (2002) provide a comprehensive review of the literature on the effect of tax policy on business investment and conclude "Recent empirical studies appear to have reached a consensus that the elasticity of investment with respect to the tax-adjusted user cost of capital is between -0.5 and -1.0."

[10] For instance, introducing provisions that maximize economic growth could reduce tax revenues. Eliminating MACRS would broaden the tax base, but it would increase the cost of capital which would decrease investment.

[11] Research and experimentation expenses by businesses typically are deductible as incurred, like all business expenses, but research is unusually important to innovation and job creation. The Camp plan requires businesses to deduct these expenses over a five-year period. This treatment is mitigated slightly by retaining a modified R&E tax credit.

[12] Last-In First-Out (LIFO) accounting for inventories has been a permitted method for inventory accounting since the 1930s. It prevents business from paying tax on increases in the value of inventories attributable to inflation.

The Camp tax reform proposal sought to correct some of the structural deficiencies in the current system while remaining budget neutral. However, based on analyses by the Treasury Department, Joint Committee on Taxation, and others, it did not provide fundamental tax reform to stimulate economic growth.

In a 2007 study on increasing the competitiveness of U.S. businesses, the Treasury Department directly addressed the issue of how eliminating accelerated cost recovery provisions, while lowering the corporate tax rate to 28 percent, might affect overall economic growth.[13] They rely on a multi-sector, macroeconomic model for their analysis and they conclude:

> "… the Treasury Department estimates that the combined policy of base broadening and lowering the business tax rate to 28 percent might well have little or no effect on the level of real output in the long run because the economic gain from the lower corporate tax rate may well be largely offset by the economic cost of eliminating accelerated depreciation (Office of Tax Policy (2007), p. 48)."

More recent evidence of the dynamic effect of tax reform is contained in Bull, Dowd and Moomau (2011) where the authors rely on the macroeconomic model presently used by the Joint Committee on Taxation to evaluate the dynamic effects of tax law changes. Specifically, the authors examine a policy scenario that couples a 5-percentage point reduction in the corporate tax rate with a partial repeal of MACRS. They estimate that the benefits of the rate cut are offset by the increase in the cost of capital from the repeal of MACRS. Overall economic growth is substantially unchanged due to the reduction in incentives to save that are a result of the increased cost of capital.

In 2014, the JCT (Joint Committee on Taxation (2014)) provided its own analysis of the macroeconomic effects of Chairman Camp's tax reform plan.[14] While their simulations showed a relatively small increase in gross domestic product (GDP) under the plan over a 10-year horizon, this effect is dominated by the reduction in individual income tax rates that result in higher consumption.[15]

The JCT estimates that the combined effect of a lower corporate tax rate and repeal of MACRS will, over time, result in a capital stock that grows more slowly than under current law. In fact, much of the economic growth in the early years is because the repeal of accelerated depreciation does not occur under the plan until the second five years of

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[13] Their proposal included several other base broadening provisions the largest being the repeal of MACRS.

[14] The Camp plan contained many other proposals that would interact with the corporate tax rate reduction and repeal of MACRS. In addition, the corporate rate reduction was phased-in over several years and the depreciable basis of certain property is indexed for inflation. Importantly, the plan also significantly lowers individual income tax rates.

[15] Joint Committee on Taxation (2014), *Macroeconomic Analysis of the Tax Reform Act of 2014*, JCX-22-14, February, page 21 (detailed discussion pages 10 – 20).

the proposal. The JCT recognizes that the long-term effect of MACRS repeal is to increase the cost of capital and reduce business investment:

> "The repeal of accelerated depreciation does not occur until 2016, thus delaying the negative influence of this provision, at the same time that reduced tax rates on income from capital are providing an incentive for increased investment. *Over time, the cumulative effects of the repeal of MACRS and amortization of intellectual property begin to outweigh the positive incentives from reduced rates* in standard MEG simulations." (Joint Committee on Taxation (2014), p. 8, emphasis added.)

Recent empirical simulations of the Camp plan support the JCT findings. A Heritage Foundation analysis of the Camp plan found that it would increase the cost of capital, reduce investment, and lower productivity gains.[16]

The Tax Foundation reached similar conclusions. However, the Tax Foundation extended their analysis to show that if the Camp plan ***retained MACRS, it would generate 6 times the growth*** in the long term.[17]

[16] Refer to Dubay, Curtis S. and David R. Burton, *Chairman Camp's Tax Reform Plan Keeps Debate Alive Despite Flaws*, The Heritage Foundation, Backgrounder #2890, March 14, 2014. The Heritage Foundation found that the U.S. capital cost recovery system is currently less generous than the Organization for Economic Co-operation and Development average, and the Camp plan would make it much worse by repealing MACRS. The Heritage Foundation data analysis of the Camp plan found that it would increase the cost of capital placed in service in the U.S., reduce investment, and lower productivity gains.

[17] Refer to Entin, Stephen J., Michael Schuyler, and William McBride, *An Economic Analysis of the Camp Tax Reform Discussion Draft*, The Tax Foundation Special Report No. 219, March 14, 2014.

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Appendix A – Description of the Model and Data

Our starting point for calculating the cost of capital is investment flow data compiled by the Bureau of Economic Analysis (BEA). The data represent investment in non-residential fixed assets in 2013, the last year that data are available. The data is disaggregated into 63 industrial sectors and 96 asset types.

For each industry-asset combination, we assign a depreciation life and depreciation method based on instructions in IRS Publication 946, *How to Depreciate Property*. An estimate of economic depreciation for all 96 asset types and for a limited number of industries is also obtained from BEA. This results in three 63x96 matrices: (i) investment, (ii) depreciation method, (iii) depreciation life, and (iv) economic depreciation which form the basis of our model.

Our estimates rely on the Hall-Jorgenson (1967) user cost of capital formula, Equation (1) in the text, which we reproduce here:

$$(r - \pi + \delta)\frac{(1 - k - \tau z)}{(1 - \tau)}.$$

In this formula:

- r is the net-of-tax rate of return a company requires to attract investors;
- π is the inflation rate on capital goods;
- δ is the rate of economic depreciation
- τ is the statutory corporate tax rate;
- k is the investment credit rate; and
- z is the present value of depreciation deductions.

We assume a 6 percent rate of return (r), an inflation rate (π) of 2.5 percent, a corporate tax rate (π) of 35 percent and a zero investment tax credit (k).[18]

For each of the more than 6,000 industry-asset combinations, we calculate the present value of depreciation deductions based on the asset's depreciation life, depreciation method and rate of inflation. We use the half-year convention as explained in Publication 946. For assets put in place after 1986, there are three types of depreciation method available based on the asset type: 200 percent declining balance (200DB), 150 percent declining balance (150DDB) and straight-line depreciation (SL).

For each industry-asset pair we calculate the cost of capital based on the Hall-Jorgenson formula. Aggregated figures in the text are weighted by investment dollars for each category.

[18] We calculate the cost of capital net of economic depreciation (δ) for comparison with other studies.

Appendix B – Historical Context of Accelerated Cost Recovery

History, as a guide, tells us that accelerated cost recovery has been and remains an important feature of the tax code. The presence of this feature, on which most investment relies, is an important aspect of tax planning.

In 1954, the Congress allowed statutorily the use of accelerated depreciation methods.[19] Since that time, despite many legislative changes, the presence of accelerated cost recovery remains a fundamental feature of the tax code.

During the past 60 years, businesses could rely on recovery lives and methods that would keep pace with their investment needs as well as help to stimulate investment. However, the biggest impact on capital investment would occur with equipment and intellectual property asset classes.[20]

Table 6 – Presence of Accelerated Depreciation in the Federal Internal Revenue Code

Tax Year	Recovery Life Reference	Method of Depreciation for Equipment	Method of Depreciation for Structures
1954 – 1961	Bulletin F	DDB/SL	DDB/SL
1962 – 1970	Guidelines	DDB/SL	1.5DB/SL
			DDB/SL
1971 – 1980	Asset Depreciation Range	DDB/SL DDB/SYD/SL	1.5DB/SL
1981 – 1985	Accelerated Cost Recovery System	1.5DB/SL	1.75DB/SL
1986 – present	Modified Accelerated Cost Recovery	DDB/SL	SL

[19] Since the inception of the Internal Revenue Code in 1913, taxpayers were given leeway to determine useful service lives over which to depreciation new investment. However, the need to pay for public works programs (in 1933 and 1934) encouraged the Treasury to issue guidance on the appropriate service lives and methods of depreciation. The transition to our modern cost recovery system began in 1942 with the introduction of capital gains treatment of the sale of depreciable assets.

[20] Currently, annual depreciation deductions for structures use the straight-line method and recovery periods that are somewhat comparable to ADS periods. Therefore, while experiencing a loss of acceleration with longer recovery periods, the effects will not be as pronounced as the effects on equipment.

These two asset classes make significant contributions to our economic growth and productivity. Equipment, generally, provides the foundation for productive services like manufacturing concerns. Intellectual property, generally, provides the foundation for technological change. Eliminating accelerated methods of cost recovery will increase the cost of those investments and in many cases, will encourage businesses to delay or defer investment decisions.

However, the need for accelerated cost recovery is not just important to stimulate investment. It plays an important role in the decisions to invest in certain assets as well as the decision making for more capital-intensive industries.