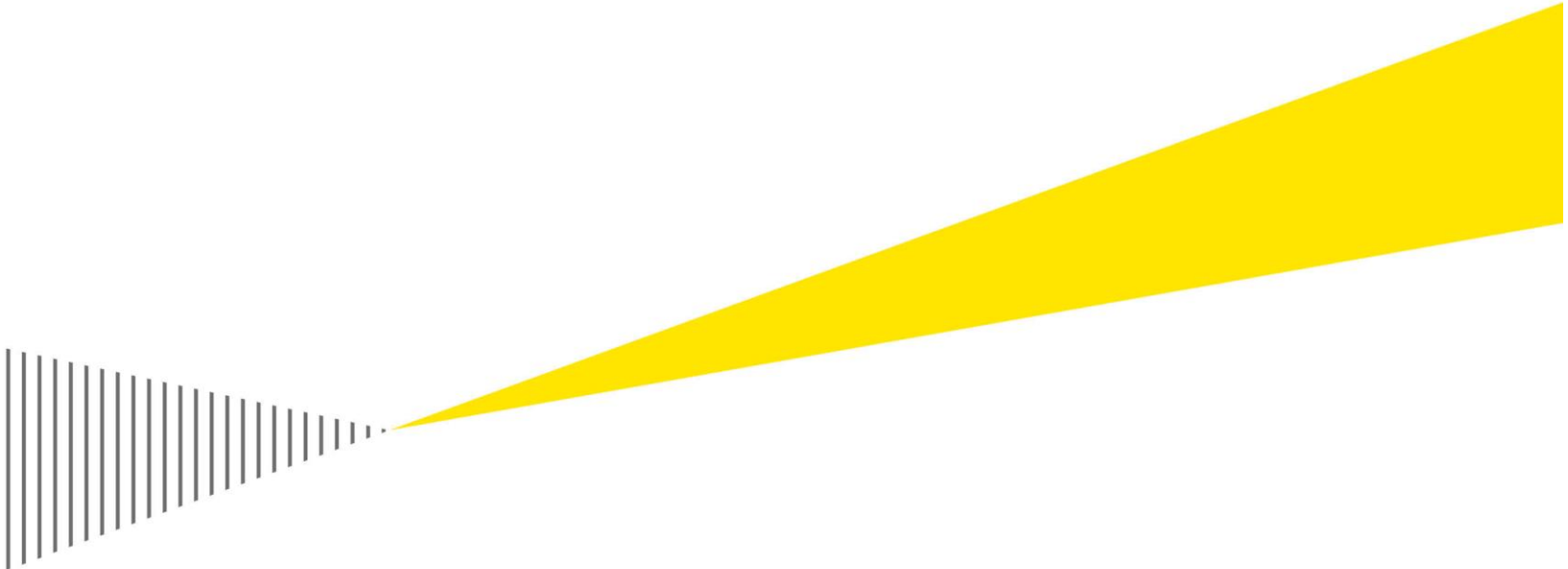


Economic Impact of Repealing Like-Kind Exchange Rules

Prepared on behalf of the Section 1031 Like-Kind Exchange Coalition

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Building a better
working world

Executive summary

Purpose

This analysis examines the macroeconomic impact of recent proposals to repeal the IRC Section 1031 like-kind exchange rules. These rules are used extensively in the real estate, transportation, equipment/vehicle rental and leasing, and construction industries. The like-kind exchange rules facilitate the exchange of assets by individual and business entity taxpayers and help expand opportunities to relocate to better or more appropriate sites and to exchange assets for those that better meet business needs. Since their inception in 1921, the tax policy upon which the like-kind exchange rules are based has been that it is unfair to tax a “paper” gain when there is a continuity of investment, i.e. no “cashing out” by the taxpayer. From the perspective of the overall economy, reducing impediments to the transfer of property helps improve the overall allocation of capital.

Recent tax reform plans such as former Senate Finance Committee Chairman Max Baucus’ (D-MT) 2013 cost recovery and tax accounting reform discussion draft and former House Ways and Means Committee Chairman Dave Camp’s (R-MI) Tax Reform Act of 2014 have proposed to use the revenue from repeal of the like-kind exchange rules to finance a lower corporate income tax rate. The Administration’s 2016 budget also proposes a limitation on real property like-kind exchange deferral to \$1 million per taxpayer per year, and further proposes making artwork and collectables ineligible for like-kind exchange treatment.

Findings

Repealing like-kind exchange rules would subject businesses that rely on these rules to a higher tax burden on their transactions, resulting in longer holding periods, greater reliance on debt financing, and less-productive deployment of capital in the economy. Moreover, many affected businesses are in pass-through form, which would not receive a benefit if the revenue from repeal of like-kind exchange rules is used to finance a lower corporate income tax rate.

Impact on GDP, Investment & Labor

This study uses a standard economic model of the US economy to estimate the long-run economic impact of repealing the like-kind exchange rules. When the revenues are used to finance a revenue neutral reduction in the corporate income tax rate, this analysis finds that the combined impact would result in a smaller economy, with less investment and lower labor incomes for workers:

- ▶ GDP is estimated to fall by \$8.1 billion each year (0.04% decline in 2013 dollars) in the long-run.
- ▶ Investment is estimated to fall by \$7.0 billion (0.18% decline in 2013 dollars) in the long-run.
- ▶ Labor income is estimated to fall by \$1.4 billion (0.11% decline in 2013 dollars) in the long-run.

This net impact suggests that this policy change is at cross-purposes with some of the objectives of tax reform: While repealing like-kind exchange rules could help fund a reduced corporate income tax rate, its repeal increases the tax cost of investing by more than a corresponding revenue neutral reduction in the corporate income tax rate and reduces GDP in the long-run.

The impacts are somewhat larger if the revenue from repeal of the like-kind exchange rules are used to finance higher government spending – a \$13.1 billion (0.07%) decline in long-run GDP – and somewhat smaller, if instead used for a revenue neutral reduction in both the corporate income tax rate and taxes on the income of pass-through businesses – a \$6.1 billion (0.03%) decline in long-run GDP.

The key source of these estimated impacts is the finding that the repeal of the like-kind exchange provisions, even when paired with a revenue neutral reduction in the corporate income tax rate, increases the cost of capital for business investment. The higher cost of capital not only discourages investment, but also reduces the velocity of investment through longer holding periods, whereby business investment is locked into specific investment for a longer period of time, and greater reliance on debt financing.

The higher cost of capital reduces investment and results in a smaller capital stock than the economy would have otherwise. The smaller capital stock reduces labor productivity and results in a lower level of output than the economy would produce absent the tax change. The productive capacity of the economy is, in effect, reduced by the repeal of the like-kind exchange rules even when combined with a revenue neutral reduction in the corporate income tax rate.

Concentrated Impact on Certain Industries

This analysis also finds that these broad economy-wide impacts are concentrated in those industries with economic activity most closely related to the like-kind exchange rules. Estimates of the gross impact (i.e., without the offsetting general equilibrium impacts) on these industries without accounting for the impact of how associated revenues are used suggest large potential dislocations.

- ▶ The specialty construction trade industry is estimated to contract in total by \$8.0 billion in output annually in the long-run.
 - ▶ A \$2.3 billion direct impact on this industry with an additional \$5.7 billion decline of economic activity from impacts on suppliers (indirect effect) and from the impact on the incomes of those working in the industry (induced effect).
- ▶ The combined residential and non-residential real estate industries are estimated to contract in total by \$8.0 billion in output annually in the long-run.
 - ▶ A \$5.7 billion direct impact with an additional \$2.4 billion decline of economic activity from impacts on suppliers (indirect effect) and from the impact on the incomes of those working in the industry (induced effect).

Other industries with significant gross impacts include truck transportation (\$4.3 billion), and heavy and civil engineering construction (\$2.6 billion). In total, the impact on the top ten sub-

industries ranked by their concentration of like-kind exchange activity would result in an aggregate reduction to GDP of \$26.0 billion annually (in 2013 dollars).


Impact on Federal Tax Revenue

Another aspect of the analysis is that lower level of GDP associated with the policy changes examined would result in less federal revenue. The decline in long-run GDP of \$8.1 billion (in 2013 dollars) can be expected to result in a decline in annual federal revenue of approximately \$1.6 billion (in 2013 dollars) assuming that the federal government loses about 20% of revenue on marginal changes in GDP.

Summary

An important issue in the tax reform debate is how a lower corporate income tax rate or lower tax rates generally are paid for. Understanding the potential impact and tradeoffs associated with using the revenue from specific provisions, such as the repeal of the like-kind exchange rules, is an important consideration in designing a pro-growth tax reform plan. This analysis finds that pairing the repeal of this provision with a revenue neutral reduction in the corporate income tax rate would adversely affect the economy in the long-run as shown in the chart below.

Long-run effect of repeal on GDP each year under revenue-neutral reduction in the corporate income tax rate and alternative policy scenarios

Scenario	Annual GDP change (\$billions)	Annual GDP change (%)	
Increased revenue used to reduce corporate income tax rate	-\$8.1	-0.04%	
Increased revenue used to increase government spending	-\$13.1	-0.07%	
Increased revenue used to reduce business sector taxes	-\$6.1	-0.03%	

Note: Long-run dollar figures are scaled to the 2013 US economy.
Source: EY analysis.

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Economic Impact of Repealing Like-Kind Exchange Rules

I. Introduction

Like-kind exchange rules promulgated under Internal Revenue Code Section 1031 (the “like-kind exchange rules”) have been targeted for repeal or limitation in several recent tax reform plans to help finance a lower corporate income tax rate. These include former Senate Finance Committee Chairman Max Baucus’ (D-MT) 2013 cost recovery and tax accounting reform discussion draft and former House Ways and Means Committee Chairman Dave Camp’s (R-MI) Tax Reform Act of 2014. Moreover, the Administration’s 2016 budget proposes a limitation on real property like-kind exchange gain deferral to \$1 million per taxpayer per year, and further proposes making artwork and collectables ineligible for like-kind exchange treatment.

Like-kind exchange rules have been extensively used in the real estate, transportation, equipment/vehicle rental and leasing, and construction industries to facilitate regular transactions and reduce business costs. Like-kind exchange rules benefit businesses in these industries by expanding their opportunities to relocate to better locations and increasing their ability to exchange older assets for more efficient assets. From the perspective of the overall economy, reducing impediments to the transfer of property helps improve the overall allocation of capital.

Repealing like-kind exchange rules would subject many businesses to a higher tax burden on their transactions, which could result in longer holding periods and less-productive deployment of capital in the economy. Moreover, many affected businesses are in pass-through form, which would not receive a benefit if the revenue from repeal of like-kind exchange rules is used to finance a lower corporate income tax rate. In the Camp tax plan, for example, pass-through businesses were subject to the higher top individual rate of 35%, rather than the reduced top corporate income tax rate of 25%.

This study estimates the long-run economic impact of repealing the like-kind exchange rules. First, two illustrative case studies consider the effect of repeal on businesses’ investment incentives. Second, the economy-wide, long-run GDP impact of repeal is presented. The GDP impact is estimated using a dynamic model of the US economy. Finally, the study focuses on GDP impacts at the industry-level, highlighting which industries would be most negatively affected by repeal.

This study finds that US GDP would decline by \$8.1 billion each year (0.04% decline in 2013 dollars) in the long run if the increased tax revenue from repeal is used to reduce the corporate income tax rate. A further analysis of the gross impact (i.e., without the offsetting general equilibrium impacts) of repeal on selected sub-industries shows that the specialty construction trade industry would contract by \$8.0 billion in output annually in the long-run—more than any other sub-industry analyzed. The non-residential real estate industry would contract by \$4.7 billion in output annually in the long-run. Combined with residential real estate, just these two sub-industries within the real estate sector would contract by \$8.0 billion each year.

The study also considers the impact of repeal under two alternative policies. If the revenue from repeal is used to finance higher government spending, GDP is estimated to fall by \$13.1 billion (or 0.07% in 2013 dollars) annually in the long-run. If instead, the revenue from repeal is used to finance a revenue-neutral reduction in both the corporate income tax rate and the tax on pass-through income, GDP would fall by \$6.1 billion (0.03% decline in 2013 dollars) annually in the long-run.

II. Overview of like-kind exchanges

- ▶ *Deferring taxes on like-kind exchanges removes the burden of paying tax on noncash exchanges and reduces the “lock-in” effect of transaction-based taxes that decreases the velocity of reinvestment.*
- ▶ *Like-kind exchanges are used most widely in the real estate and equipment/vehicle rental and leasing industry. High levels of like-kind exchange activity also occur in other industries such as construction and transportation and warehousing.*

A like-kind exchange is “the exchange of property held for productive use in a trade or business or for investment if such property is exchanged solely for property of like kind which is to be held either for productive use in a trade or business or for investment.”¹ In its simplest form – a direct exchange of like-kind property between two parties – neither party is required to recognize a taxable gain or loss at the time of the exchange. There are several rationales for deferring tax on gains and losses realized in like-kind exchanges.

First, no cash may be involved in a simultaneous, direct like-kind exchange of two properties. Requiring a business to pay tax on such an exchange would be burdensome. The taxpayer would have to divert cash from other uses or even liquidate assets to pay the tax. Moreover, under current law, like-kind exchanges in which one party pays cash are subject to immediate recognition of gain. The party receiving cash, called “boot,” as part of an exchange must recognize gain to the extent of cash received.

Second, the parties involved in a like-kind exchange have continuity of investment in the same type of investment or business asset. That is, they are not “cashing out”; all equity and profits are reinvested in the business activity. Imposing a tax on a continuing investment – before the life of the investment elapses and the investment is liquidated – would discourage investment.

Moreover, consistent with the continuity of investment principle, taxpayers continue to depreciate their initial investment in business property as if the original property wasn’t disposed of. Consequently, the taxpayers’ overall depreciation deductions remain the same over the life of the investment in the business property, regardless of whether old property is held or exchanged for new property. That is, any gain deferred is subsequently offset by a reduction in future depreciation or a greater gain upon sale of the replacement property.

Third, deferring tax on like-kind exchanges is more economically efficient. Under current law, businesses do not have to consider immediate tax consequences when exchanging like-kind property. This reduces the “lock-in” effect associated with transaction-based or realization-based taxes whereby a business is discouraged from disposing of an asset or acquiring a new one due to the tax consequences. Like-kind exchanges increase the velocity of reinvestment, the rate at which businesses convert assets to better match their business needs, to operate more efficiently, or to generate more income.

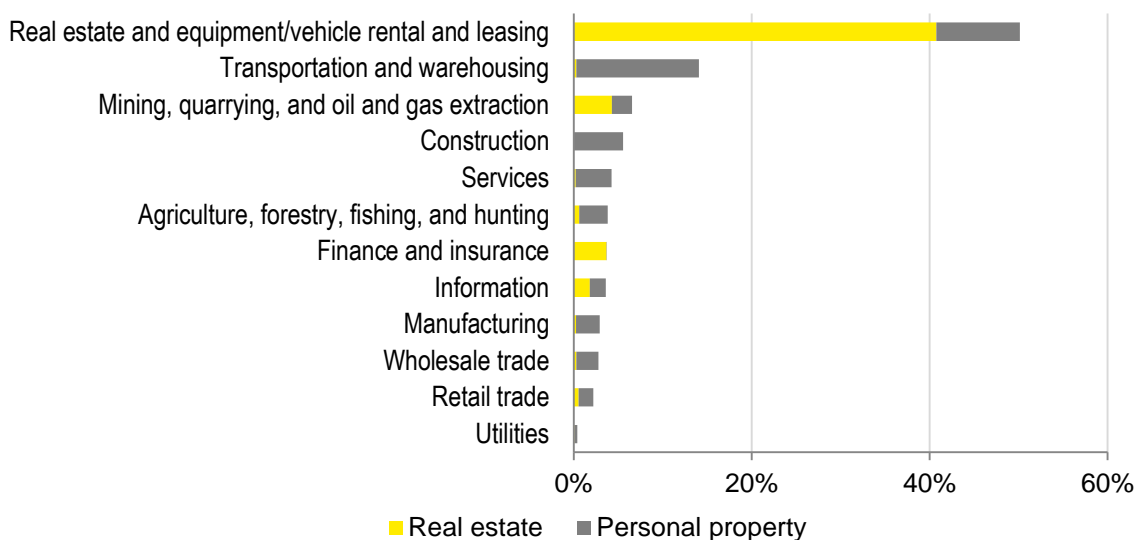
Like-kind exchange rules generally apply to exchanges of personal property and real estate. Personal property used in a trade or business can receive like-kind treatment if the assets exchanged are of like kind, which includes assets of a like class, e.g., in the same general asset

class or the same product class.² Additionally, the exchange of one real estate asset for another generally qualifies as a like-kind exchange. Notably, U.S. based real estate or personal property assets cannot be exchanged for foreign real estate or personal property assets used predominantly in a foreign country. Like-kind exchange treatment is not allowed for exchanges of inventory, stocks, bonds, notes, or other securities.

Rules providing for tax-deferred like-kind exchanges extend nearly back to the inception of the federal income tax in the United States. In 1913, the 16th Amendment to the US Constitution authorized the US Congress to establish an income tax. Only five years later, amid an income tax increase and World War I, Treasury regulations construed for the first time that a transaction was not taxable unless the property received was “essentially different from the property disposed of.”³ By 1921, an alternative tax was applied to capital gains and like-kind exchanges were explicitly excepted from capital gain recognition.⁴ Like-kind exchange rules evolved over the remainder of the 20th century to exclude exchanges of stock from like-kind exchange treatment, to allow deferred taxation of non-simultaneous exchanges,⁵ and to limit tax-free exchanges between related parties.⁶

As shown in Figure 1, like-kind exchanges are used most widely by businesses in the real estate and equipment / vehicle rental and leasing industry. This industry accounted for approximately 50% of the fair market value of property received in like-kind exchanges in recent years.⁷ Most of this value is represented by structures, such as apartment buildings, offices, and industrial facilities. Like-kind exchanges are also used extensively in a number of other industries. The transportation and warehousing industry ranked second in the value of property received in like-kind exchanges, mainly in the form of equipment, while the mining and resource extraction and construction industries ranked third and fourth, respectively. The same information is detailed in Table 1, as well as like-kind exchange property as a percentage of each industry’s capital stock.

Figure 1. Distribution of like-kind exchange property by industry, recent years



Note: The chart reflects the fair market value of property received in like-kind exchanges in the three most recent years for which data are available: 2007, 2010, and 2012. Weighted averages of these data are used to smooth year-to-year variation. Bars in the figure sum to 100%.

Source: Internal Revenue Service (IRS) data, US Census Bureau's Annual Capital Expenditures Survey; EY analysis.

Table 1. Distribution of like-kind exchange property by industry and like-kind exchange property as a percentage of industry capital stock, recent years

Industry	Real Estate	Personal property	Total	Like-kind exchange property as % of industry capital stock
Real estate and equipment/vehicle rental and leasing	41%	9%	50%	15%
Non-residential real estate	35%	1%	36%	32%
Equipment/vehicle rental and leasing	*	8%	8%	34%
Residential real estate	6%	*	6%	3%
Transportation and warehousing	*	14%	14%	17%
Mining, quarrying, and oil and gas extraction	4%	2%	7%	5%
Construction	*	6%	6%	15%
Services	*	4%	4%	1%
Agriculture, forestry, fishing, and hunting	1%	3%	4%	3%
Finance and insurance	4%	*	4%	2%
Information	2%	2%	4%	3%
Manufacturing	*	3%	3%	1%
Wholesale trade	*	2%	3%	4%
Retail trade	1%	2%	2%	2%
Utilities	*	*	*	*
Total	53%	47%	100%	5%

* Proportion is less than 0.5%.

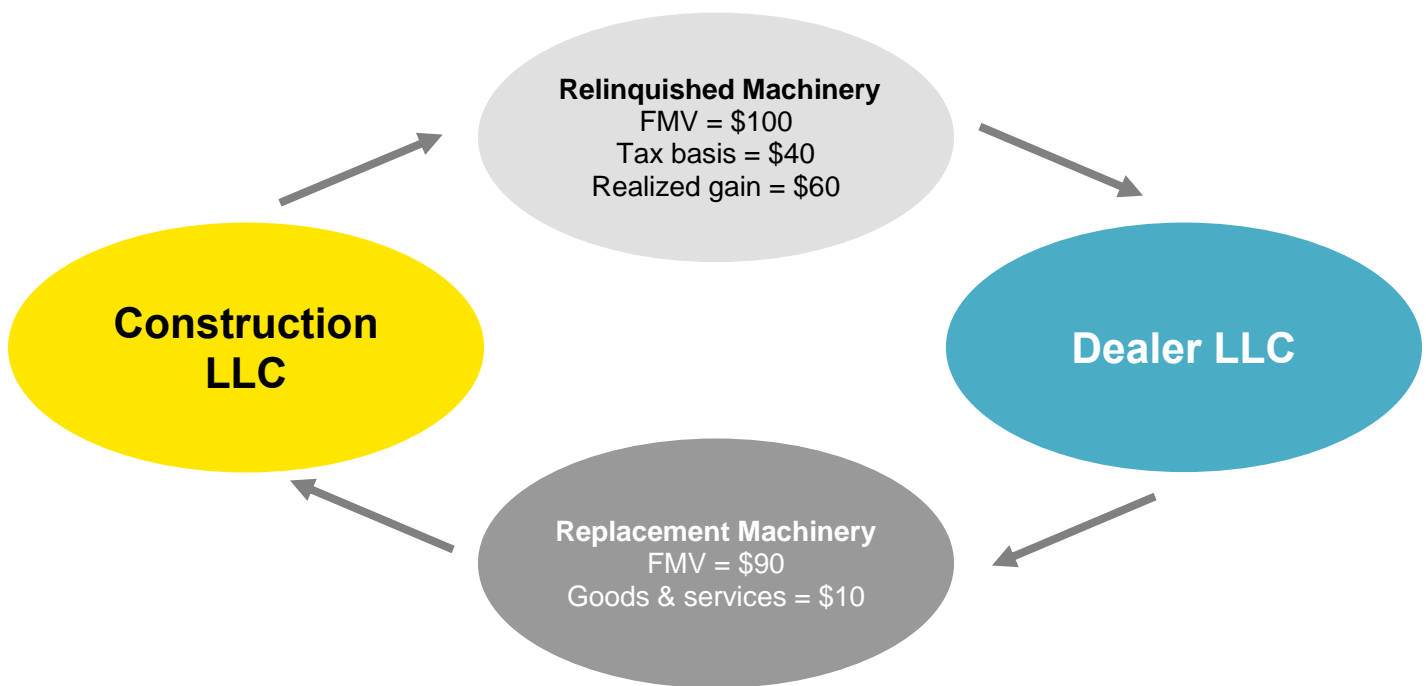
Note: The table reflects the fair market value of property received in like-kind exchanges in the three most recent years for which data are available: 2007, 2010, and 2012. Weighted averages of these data are used to smooth year-to-year variation. Bars in the figure sum to 100%. Figures may not appear to sum due to rounding.

Source: Internal Revenue Service (IRS) data, US Census Bureau's Annual Capital Expenditures Survey, and EY analysis.

Illustrative example of the taxation of a like-kind exchange in the year it occurs

The amount of tax recognized in the year a like-kind exchange occurs depends on the value and tax basis of the assets involved. Consider an example in which Construction LLC exchanges used machinery (“Relinquished Machinery”) for other like-kind machinery (“Replacement Machinery”) owned by Dealer LLC. The transaction is structured as a “trade-in.” The Relinquished Machinery has a fair market value of \$100,000, and is traded in for like-kind Replacement Machinery with a fair market value of \$90,000 and other goods and services valued at \$10,000. The goods and services are non-like-kind property and are considered boot. Construction LLC’s Relinquished Machinery has a current tax basis of \$40,000 due to depreciation deductions previously taken. Construction LLC is taxed as a pass-through entity. This transaction is diagrammed in Figure 2, below.

Figure 2. Illustrative example of a like-kind exchange of personal property (\$thousands)



Under like-kind exchange rules, the parties to the exchange recognize a taxable gain equal to the lesser of the value of boot received or gain realized. This recognized gain is subject to tax in the year of the exchange. In this example, Construction LLC realizes a gain of \$60,000 and received boot of \$10,000. It must recognize a taxable gain of the lesser of these two items: \$10,000. Because this recognized gain of \$10,000 is less than the tax depreciation claimed by Construction LLC to date, the entire gain is “recaptured” as Sec. 1245 ordinary income. For pass-through entities such as LLCs, generally taxable as partnerships for federal income tax purposes, gains recognized on personal property are treated as Sec. 1245 ordinary income to the extent of depreciation claimed to date. That is, the \$10,000 gain is subject to Construction LLC’s owners’ ordinary income tax rate of 39.6%, rather than the lower 20% capital gains tax

rate. Construction LLC's owners would owe tax of nearly \$4,000 in the year of the exchange. Realized gain that is not recognized for tax purposes is deferred from current-year tax. After recognizing gain of \$10,000 on the boot, Construction LLC defers gain of \$50,000 and forgoes the same \$50,000 of future depreciation on the Replacement Machinery.

Dealer LLC is a dealer and is giving up \$100,000 of inventory and services which do not qualify for Section 1031 like-kind exchange treatment. It pays tax at ordinary income tax rates on its profits from the sale.

The tax consequences of the exchange for Construction LLC under current law and repeal are summarized in Table 2. Under repeal, the exchange can be understood as two separate transactions. First, Construction LLC disposes of its Relinquished Machinery and, in return, receives \$100,000 of value. Second, Construction LLC acquires Replacement Machinery from Dealer LLC for \$90,000. Construction LLC also receives \$10,000 worth of goods and services from these transactions: the boot. The \$10,000 boot is not additional income to Construction LLC; it is the difference in value between the asset relinquished and the asset received.

As under current law, Construction LLC realizes a gain of \$60,000 under repeal. Without the benefit of tax-deferred like-kind exchange rules, Construction LLC must recognize the entire \$60,000 gain in the year of the exchange. Of that gain, \$60,000 – the amount attributed to depreciation previously claimed – is recaptured as ordinary income under Sec. 1245. No gain would be deferred.

The total federal tax paid by Construction LLC's owners in the current year under repeal would be nearly \$24,000, six times the current-year tax owed by Construction LLC's owners under current law.

Table 2. Current-year taxation of Construction LLC in an illustrative example of a like-kind personal property exchange under current law and repeal (\$thousands)

Facts		
Relinquished Machinery		
Fair market value of used Relinquished Machinery		\$100
Non-like-kind "boot"		\$0
Total value of Relinquished Machinery		\$100
Property received in exchange		
Fair Market value of like-kind Replacement Machinery		\$90
Non-like-kind "boot" (goods and services)		\$10
Total value of all property received		\$100
Accumulated depreciation and tax basis		
Original cost of Relinquished Machinery		\$230
MACRS depreciation claimed on Relinquished Machinery		-\$190
Tax basis of Relinquished Machinery		\$40
Gain realized		
Fair market value of Relinquished Machinery		\$100
Tax basis of Relinquished Machinery		-\$40
Realized gain on disposal of Relinquished Machinery		\$60
Tax treatment	Current law	Repeal
Amount of gain recognized	Lesser of realized gain or boot received	Entire realized gain
Realized gain	\$60	\$60
Boot received	\$10	\$10
Recognized gain	\$10	\$60
Tax		
Gain recaptured as Sec. 1245 ordinary income to the extent of depreciation	\$10	\$60
Ordinary income tax rate	39.6%	39.6%
Tax on Sec. 1245 gain	\$4	\$24
Total tax	\$4	\$24
Gain deferred	\$50	\$0

Note: This example assumes the increased tax revenue resulting from repeal would not be used to reduce the income tax rate on pass-through entities such as LLCs taxable as partnerships.

Case studies: Impact of the repeal of like-kind exchange rules on investment incentives across the life of the investment

The impact of the repeal of like-kind exchange rules on businesses' investment incentives across the life of the investment can be illustrated by calculating the after-tax rate of return of a potential investment. An investment with an after-tax rate of return greater than the investor's required rate of return – the “hurdle rate” – will be made while an investment with a return below the hurdle rate will not. Table 3 summarizes the impact of like-kind exchange repeal on illustrative mining equipment and apartment building investments.

A key factor influencing the economics of these illustrative investment projects is the extent by which the holding periods would change under the repeal of like-kind exchange rules. An increase in holding periods means that assets are, in effect, locked up for a longer period of time due to their tax treatment, which interferes with the free flow of capital and turnover of property within the overall economy.

Table 3. Results of illustrative investments under current law and repeal scenarios

	Current law	Repeal	% change
<i>\$50,000 investment by corporation in mining equipment</i>			
Holding period	2 years, 4 months	3 years, 4 months	42%
After-tax rate of return	7.6%	6.3%	-17%
Year 1 operating income (annualized, before tax) required to meet the hurdle rate of 7.0%	\$3,645	\$4,385	20%
<i>\$10 million investment by pass-through entity in apartment building</i>			
Holding period	8 years, 6 months	11 years, 7 months	37%
After-tax rate of return	8.0%	6.8%	-16%
Year 1 operating income (annualized, before tax) required to meet the hurdle rate of 7.0%	\$662,212	\$834,936	26%

Note: The investments are assumed to be placed into service on July 1 of year 1, and are evaluated over a 50-year time horizon. Under repeal, the entity is assumed to increase its borrowing to make up for the money paid in tax. These funds are then reinvested so that the pretax operating cash flow is constant across all scenarios. The holding periods used in this example under current-law and repeal scenarios reflect the findings of a survey of the members of nine trade associations conducted by EY. Survey findings are summarized in Appendix C.

Corporation invests in mining equipment

In the first example, a corporation is evaluating a potential investment in mining equipment costing \$50,000 that is expected to add incremental pretax operating income of \$4,000 in its first year. This equipment is expected to decline in value each year as its shorter useful life elapses. The corporation's hurdle rate for investment in mining equipment is assumed to be 7.0%; that is,

in order to proceed with the investment, the corporation requires an annual rate of return of 7.0% or higher.

The corporation plans to relinquish the equipment after two years and four months, at which time it will use a like-kind exchange to acquire newer, more-advanced equipment. At this time, the corporation will incur no tax under current law. The corporation expects an after-tax rate of return of 7.6%, which exceeds its hurdle rate of 7.0%. The corporation will proceed with its investment in the mining equipment, making its operations more profitable. The investment will meet the 7.0% hurdle rate with first-year operating income of as low as \$3,645.

However, the profitability of this potential investment is reduced under repeal, whereby the corporation would be required to pay tax after two years, rather than deferring the tax into the future. Under repeal, the corporation would likely hold the asset for an additional year in order to defer recognition of gain.⁸ Still, the corporation would owe tax sooner under repeal than under current law, reducing the present value of the investment. The after-tax rate of return on the investment under this scenario falls to 6.3%. Even with a longer holding period and a lower corporate income tax rate, the investment would no longer meet its hurdle rate.⁹ The minimum operating income required in the investment's first year increases by approximately 20%, to \$4,385. The corporation would not purchase the mining equipment.

Pass-through entity invests in an apartment building

In the second example, pass-through investors consider whether to purchase an apartment building for \$10 million. They expect the apartment building to initially earn annual net operating income of \$800,000. The investors will purchase the apartment building if it expects that the after-tax rate of return will be greater than the hurdle rate of 7.0%.

The investors plan to relinquish the apartment building in a like-kind exchange after holding it for eight years, six months. Under current law, the investors will incur no immediate tax. The gain realized upon relinquishing the asset is instead deferred. Under these conditions, the investors estimate that they will achieve an after-tax rate of return of 8.0% on their investment. This exceeds their hurdle rate of 7.0%. While the investors plan for \$800,000 of year-one operating income, the investment would be profitable with operating income of as low as approximately \$662,000. The investors will choose to proceed with the investment.

However, under repeal, the investors would incur tax upon relinquishing the property. The tax payment that they deferred under current law would instead be payable currently. Even if the building is held for more than three additional years, the profitability of the investment would be reduced. Assuming a holding period of 11 years, seven months, the investment's after-tax rate of return would be 6.8% under repeal – less than the hurdle rate of 7.0%.¹⁰ The operating income required for profitability under repeal increases approximately 26% to nearly \$835,000, higher than the investors' expectation of \$800,000. The investors would not purchase the apartment building.

III. Impact of the repeal of like-kind exchange rules on investment incentives

- ▶ *Repeal would subject the sale of used assets to current – rather than deferred – taxation, increasing the overall tax burden on investment. Investment would be discouraged.*
- ▶ *Businesses would be incentivized to hold assets for a longer period, rather than to convert assets to better match their business needs, to operate more efficiently, or to generate more income.*
- ▶ *Investment incentives would be most adversely impacted in the transportation and warehousing, construction, and real estate and equipment/vehicle rental and leasing industries.*

The repeal of the like-kind exchange rules would increase the cost of capital for investment that makes use of these rules. The higher cost of capital discourages investment and ripples through the economy, affecting economic activity that makes use of assets that rely on the like-kind exchange rules. Activity used in the production of like-kind exchange assets would also be adversely affected.

This analysis uses the concept of the Marginal Effective Tax Rate (METR) on assets to measure the impact of taxation under current law and repeal of like-kind exchange rules on investment incentives. This measure, which is derived from an estimate of the cost of capital for an investment, is frequently used by the Congressional Budget Office (CBO), Congressional Research Service (CRS), Joint Committee on Taxation (JCT), and US Department of the Treasury to gauge the impact of changes in tax policy on investment incentives, serves as a key input to the macroeconomic modeling.¹¹

The METR measures the additional income that a new barely profitable hypothetical investment is required to earn to cover taxes over its lifetime. It captures the major aspects of the tax system affecting investment, such as the statutory income tax rates, the cost recovery system, and the interest deduction. The measure also includes the impact of investor-level taxes on dividends, capital gains and interest. If a policy change results in a 10% increase in an industry's METR, for example, this implies that the return to a new investment would be, on average, 10% lower in that industry.

Illustration of how the repeal of like-kind exchange rules impacts the METR

The repeal of like-kind exchange rules enters the METR through an increase in the present value of taxation. Under existing like-kind exchange rules businesses are able to defer taxes when reinvesting the proceeds from an asset sale into a qualifying asset. However, the repeal of like-kind exchange rules would require businesses to pay tax upon sale.¹² Thus, the repeal of like-kind exchange rules would increase the METR on investment. For a more detailed description of the framework used by this report to estimate the cost of capital, see Appendix B.

Table 4 demonstrates the impact of the repeal of like-kind exchange rules on the METR of several illustrative assets assumed to qualify for like-kind exchange under current law. The change in the METR resulting from repeal is driven by two countervailing factors:

1. Repeal would subject the sale of used assets to current (rather than deferred) taxation thus increasing the overall tax burden on new investment.
2. Under repeal businesses would increase the holding period for assets; the longer the holding period the lower the present value of the tax liability.

The METR of the illustrative 5-year tax life asset, for example, is 22.9% under current law. Because the present value of capital gains tax payments is \$0 under current law, the holding period does not affect the METR. Under repeal, the METR increases to 32.1%, assuming a 3-year holding period. As the holding period under repeal increases, the METR will fall as the benefit of deferral increases and will approach the current law METR. With a holding period of 20 years, the METR for this illustrative investment would be only slightly above the METR under current law.

Table 4. Change in METR of illustrative corporate and pass-through investments under current law and with the repeal of like-kind exchange rules

	Current law METR	METR under repeal with different lengths for how long investment is held until sold				
		3 years	5 years	10 years	15 years	20 years
5-year tax life asset (corporate equipment)	22.9%	32.1%	28.5%	24.1%	23.2%	23.0%
10-year tax life asset (corporate equipment)	25.7%	37.2%	35.0%	30.6%	27.7%	26.6%
27.5-year tax life asset (pass-through structure)	32.2%	38.8%	38.6%	37.4%	36.1%	34.9%
39-year tax life asset (pass-through structure)	38.8%	43.0%	43.0%	42.4%	41.7%	41.1%

Note: The METR calculations for the illustrative asset types assume a 7% nominal discount rate, corporate tax treatment (using a corporate income tax rate of 35%) for equipment, and pass-through tax treatment (using 39.6% income and 23.8% capital gains tax rates). The assumed economic depreciation rates are 20% for the 5-year tax life asset, 10% for 10-year tax life asset, 2% for the 27.5-year tax life asset, and 2% for the 39-year tax life asset. Under current law, the present value of capital gains tax payments is assumed to be \$0. The holding period does not affect the METR.

Source: EY analysis.

In addition to encouraging longer holding periods, the increase in taxation would also increase the cost of equity financing relative to debt financing and encourage businesses to substitute debt for equity. An increase in leverage would reduce the METR thus mitigating some of the impact of the repeal of like-kind exchange rules. This reflects that the current income tax system generally allows a deduction for interest payments but has no similar provision for equity (e.g., a deduction for dividend payments or basis adjustment for retained earnings). While this behavioral response is not included in the table above for illustrative clarity, it is frequently

included in tax policy modeling and is included in the macroeconomic analysis.¹³ Further, the table above does not account for changes in business sector income tax rates that may be enacted as part of repeal. Rather, it shows only the effect of changing holding periods on the METR under repeal.

Impact of repeal on the METR for major industries

Estimates of the METR by major industry as well as the corporate and pass-through sectors are provided in Table 5. Two sets of METR estimates are presented: (1) the isolated impact of the repeal of like-kind exchange rules, and (2) the impact of the repeal of like-kind exchange rules paired with a revenue-neutral reduction of the corporate income tax rate (broadly similar to the Camp tax plan). Where the isolated impact of repeal is analyzed, the investment incentive impact of the repeal of like-kind exchange rules is concentrated in the transportation and warehousing (5.2% increase in METR), construction (3.3% increase in METR), and real estate and equipment/vehicle rental and leasing (2.4% increase in METR) industries. Overall, the repeal of like-kind exchange rules increases the METR in the business sector by 1.0%.

The net impact suggests that this policy change is at cross-purposes with some of the objectives of tax reform: While repealing like-kind exchange rules could help fund a reduced corporate income tax rate, its repeal increases the tax cost of investing by more than a corresponding revenue neutral reduction in the corporate tax rate and reduces GDP in the long-run. On the other hand, the repeal of like-kind exchange rules to fund a revenue-neutral reduction of the corporate income tax rate does reduce the METR differential between the corporate and pass-through sectors, suggesting some reduction in tax-induced capital allocation. Both of these impacts are accounted for in the macroeconomic modeling of these policy changes.

Table 5. Marginal effective tax rates (METR) of the business sector under current law and repeal of like-kind exchange rules

	Current law	Repeal of like-kind exchange rules	Repeal and revenue-neutral CIT rate reduction
	METR	% change	% change
Transportation and warehousing	25%	5.2%	4.2%
Construction	31%	3.3%	2.4%
Real estate and equipment/vehicle rental and leasing	25%	2.4%	2.1%
Mining	21%	1.2%	0.6%
Information	23%	0.7%	0.0%
Wholesale trade	34%	0.7%	-0.6%
Agriculture, forestry, fishing, and hunting	32%	0.6%	-0.2%
Finance and insurance	30%	0.5%	-0.5%
Manufacturing	28%	0.3%	-0.8%
Services	28%	0.3%	-0.5%
Retail trade	34%	0.3%	-0.9%
Utilities	24%	0.1%	-0.6%
Business sector	28%	1.0%	0.1%
Corporate sector	29%	0.7%	-0.5%
Pass-through sector	24%	1.7%	1.7%

Note: METR estimates do not reflect any general equilibrium impacts (e.g., accounting for the change in the after-tax rate of return to capital or the shifting of investment between industries and sectors to compute METR aggregates). The estimates do include the behavioral responses of industries in the form of longer holding periods for assets and changes in the use of debt versus equity financing. The assumed holding period with the repeal of like-kind exchange rules is 3 years for personal property and 12 years for real property. The long-run revenue-neutral corporate income tax rate is approximately 34%. The business sector is the combination of the corporate sector (e.g., C corporations) and the pass-through sector (e.g., S corporations, partnerships, limited liability companies, sole proprietorships). Also included in the model, though not reported in this table, is the owner-occupied housing sector.

Source: EY analysis.

IV. Macroeconomic analysis of the repeal of like-kind exchange rules

- ▶ *Using the increased tax revenue from repeal of the like-kind exchange rules to reduce the corporate income tax rate would result in an annual \$8.1 billion decline in US GDP in the long run.*
- ▶ *Real estate and equipment/vehicle rental and leasing GDP would decline annually by \$6.7 billion (a decline of 0.27%).*
- ▶ *US GDP would also decline if the increased tax revenue from repeal of the like-kind exchange rules were used to reduce business income taxes or to increase government spending.*

The macroeconomic impact of repeal of the like-kind exchange rules are estimated using the EY General Equilibrium Model of the US Economy (the “EY GE Model”). This model is designed to capture the major features of the US economy and the key economic decisions of businesses and households affected by tax policy. Businesses and households incorporate the after-tax return from work and savings into their decisions of how much to produce, save, and work. The repeal of the like-kind exchange rules affects businesses through changes in their cost of capital and the commensurate impact on investment. Further, investment shifts between industries and sectors of the US economy, as well as between the United States and the rest of the world. The model is initially calibrated to reflect the US economy in 2013.¹⁴ A technical description of the EY GE Model is provided in Appendix A.

The EY GE Model is an overlapping generations (OLG) model similar to those used by the CBO, JCT, and US Department of the Treasury.¹⁵ An important aspect of this type of model is that policy changes are assumed to be financed by an offsetting change in fiscal policy, either through a change in tax policy or government spending. In the case of an analysis of a policy that reduces taxes, this element of the model means that tax cuts are required to be paid for in a manner that leaves the federal government on a fiscally sustainable path. In the case of tax increases, such as the repeal of the like-kind exchange rules, the additional revenues are used to finance either an offsetting tax cut or an increase in government spending.¹⁶

The macroeconomic impacts are estimated for a repeal of like-kind exchange rules paired with a revenue-neutral reduction in the corporate income tax rate scenario as well as two alternative policy scenarios. The alternative policy scenarios consider other uses for the revenue raised from the repeal of like-kind exchange rules, namely: (1) an increase in government spending, and (2) a reduction of business sector taxes (i.e., taxes for both the corporate and pass-through sectors). Additionally, the sensitivity of the estimated macroeconomic impacts to key model parameters is examined.

Macroeconomic impact of the repeal of like-kind exchange rules on the US economy

The repeal of like-kind exchange rules is estimated to, net of a revenue-neutral reduction in the corporate income tax rate, reduce US GDP in the long-run. Using the increased revenue from the repeal to instead either increase government spending or reduce business sector taxes

generally is also estimated to also reduce long-run GDP.¹⁷ Table 6 summarizes the long-run impact of repeal on GDP under the three estimated scenarios. Using the increased revenue from repeal to increase government spending would have the most negative impact because, unlike reducing income tax rates, it would not decrease the cost of capital across the economy.

Table 6. Long-run effect of repeal on GDP each year under revenue-neutral reduction in the corporate income tax rate and alternative policy scenarios

Scenario	Annual GDP change (\$billions)	Annual GDP change (%)
Use increased revenue to reduce corporate income tax rate	-\$8.1	-0.04%
Alternative policy 1: Use increased revenue to increase government spending	-\$13.1	-0.07%
Alternative policy 2: Use increased revenue to reduce business sector taxes	-\$6.1	-0.03%

Note: Long-run dollar figures are scaled to the 2013 US economy.
Source: EY analysis.

If the increased revenue from repeal is used to reduce the corporate income tax rate – broadly similar to the policy change proposed in the Camp tax plan – the long-run GDP decline scaled to the 2013 US economy would be \$8.1 billion each year. Further, repeal combined with a revenue-neutral increase in government spending would result in a GDP decline of \$13.1 billion annually (relative to the 2013 US economy) in the long-run, or by approximately 0.07% of GDP. A broader reduction in business tax rates – a proportional decrease in corporate income and pass-through income tax rates – would, scaled to the 2013 US economy, reduce GDP by \$6.1 billion annually in the long-run. Additional economic impacts for repeal of the like-kind exchange rules paired with the revenue-neutral corporate income tax rate reduction and alternative policies are detailed below.

Repeal of like-kind exchange rules paired with reduction in the corporate income tax rate

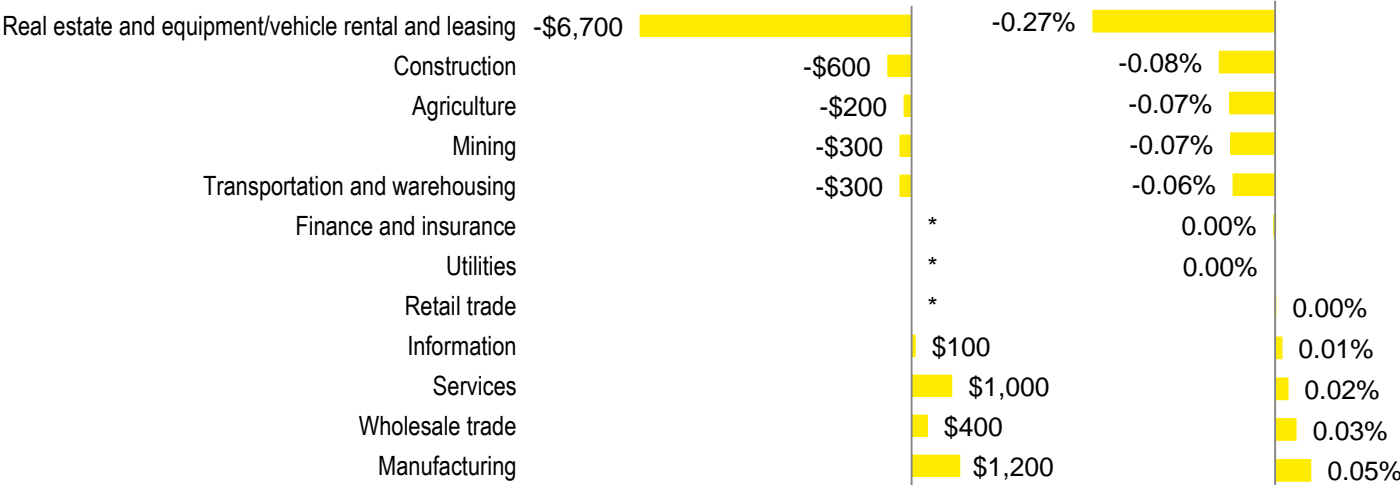
Using the revenue from repeal of the like-kind exchange rules to finance a revenue neutral reduction in the corporate income tax rate would subject many businesses in pass-through form, which are subject to individual income tax rates, to higher taxes. In some respects, this policy scenario is broadly similar to the Camp tax plan where many pass-through businesses were subject to the top individual rate of 35% (reduced from a top rate of 39.6%) rather than the significantly lower corporate income tax rate of 25% (reduced from a top rate of 35%).

Accordingly, this simulation results in impacts that vary significantly depending on whether an industry is composed of business predominately in pass-through or C corporation form. This result can be seen in Figure 3. Real estate and equipment/vehicle rental and leasing – a predominantly pass-through industry – is estimated to have the largest impact with an annual

decline in this industry’s GDP of 0.27% (\$6.7 billion scaled to the 2013 US economy) in the long-run. Other industries with substantial levels of like-kind exchange activity would also experience sizable reductions in GDP. The construction industry would decline by 0.08% (\$600 million scaled to the 2013 US economy) and the agriculture industry by 0.07% (\$200 million scaled to the 2013 US economy) annually in the long-run.

For industries with a lower concentration of like-kind exchange activity or higher concentration of corporate sector activity the economic impact of the repeal of like-kind exchange rules is mitigated. The mining industry, for example, makes considerable use of like-kind exchange activity rules, but is also predominately in the corporate sector. As such, GDP in the mining industry declines annually by 0.07% (\$300 million scaled to the 2013 US economy). In addition to a decline in overall GDP, there is also shifting of economic activity between industries: GDP increases in the information (0.01%), services (0.02%), wholesale trade (0.03%), and manufacturing (0.05%) industries.

Figure 3. Long-run effect of repeal on GDP each year in the business sector under revenue-neutral reduction in the corporate income tax rate scenario (\$million)



* GDP impact is less than \$50 million.

Note: Long-run dollar figures are scaled to the 2013 US economy. The business sector is the combination of the corporate sector (e.g., C corporations) and the pass-through sector (e.g., S corporations, partnerships, limited liability companies, sole proprietorships); it excludes owner-occupied housing.

Source: EY analysis.

Additional shifting of activity in the US economy is a result of the net increase in the cost of capital increasing the price of capital relative to labor. This results in both the substitution of labor for capital across the US economy as well as a shift in economic activity from capital-intensive to labor-intensive industries. This impact can be observed in the macroeconomic indicators presented in Table 7.

In particular, the reduction in GDP in the US economy is driven primarily by a reduction in investment (0.18%, or a \$7.0 billion reduction in investment relative to the size of the 2013 US economy). Moreover, while the supply of labor is approximately unchanged,¹⁸ the increased labor intensity in a smaller economy reduces the after-tax wage and leads to a 0.01% reduction in labor income (\$1.4 billion relative to 2013 US economy). Overall, the results suggest that the

reduced size of the US economy from the repeal of like-kind exchange rules paired with a revenue-neutral reduction in the corporate income tax rate would, in the long-run, offset roughly \$1.6 billion in federal revenue each year (in 2013 dollars) assuming the federal government loses about 20% for marginal changes in GDP. The resulting corporate income tax rate would be 33.6%.¹⁹

Table 7. Long-run effect of repeal on macroeconomic indicators each year under revenue-neutral reduction in reduced corporate income tax rate scenario

	Amount	% change
GDP (\$mil)	-8,100	-0.04%
Consumption (\$mil)	-1,100	-0.01%
Investment (\$mil)	-7,000	-0.18%
Capital stock (\$mil)	-58,500	-0.15%
Labor income (\$mil)	-1,400	-0.01%
After-tax wage	n/a	-0.18%

Note: Long-run dollar figures are scaled to the 2013 US economy.

Source: EY analysis.

Isolating the gross impact of repeal on selected sub-industries

The negative impact of the repeal of like-kind exchange rules would most adversely impact industries with the highest proportion of like-kind exchange activity relative to total economic activity. Accordingly, this analysis examines the impact of the repeal of like-kind exchange rules on 10 selected sub-industries with a disproportionate reliance on the like-kind exchange rules. The estimated impact is isolated to the change in GDP resulting from repeal without taking into account any general equilibrium impacts (e.g., changes in industry capital-labor ratios) nor the offsetting impacts from the use of revenue raised from the repeal of like-kind exchange rules.²⁰

Table 8 displays the direct, indirect, and induced GDP impacts of repeal on the selected sub-industries. Specifically, this includes the change in economic activity associated with the directly impacted industry (direct), the reduced demand for intermediate goods from suppliers (indirect), and the lower consumption from impacted employees (induced). These impacts are scaled to the 2013 US economy.

The GDP of the non-residential real estate sub-industry would contract by \$3.3 billion annually as a direct effect of repeal. An additional \$0.7 billion decline of economic activity would occur annually from a reduction in the purchases of goods and services from the suppliers of the non-residential real estate industry (e.g., construction). GDP would decline a further \$0.7 billion annually because of a reduction of consumer re-spending of incomes earned by employees of the non-residential real estate industry as well as its supplying industries. This amounts to a total GDP decline of \$4.7 billion annually in the non-residential real estate and related industries.

Table 8. Long-run effect of repeal on GDP each year of the 10 sub-industries with large proportions of like-kind exchange property as a % of capital stock (\$billions)

Industry	Like-kind exchange property as % of sub-industry capital stock	Annual Direct GDP impact	Annual Indirect GDP impact	Annual Induced GDP impact	Annual Total GDP impact
Specialty trade contractors	16.0%	-\$2.3	-\$2.7	-\$3.0	-\$8.0
Non-residential real estate	14.8%	-\$3.3	-\$0.7	-\$0.7	-\$4.7
Truck transportation	35.2%	-\$1.5	-\$1.3	-\$1.6	-\$4.3
Residential real estate	14.8%	-\$2.4	-\$0.5	-\$0.5	-\$3.3
Heavy and civil engineering construction	15.2%	-\$0.8	-\$0.9	-\$1.0	-\$2.6
Air transportation	12.4%	-\$0.4	-\$0.3	-\$0.3	-\$1.0
Commercial and industrial machinery and equipment rental and leasing	15.4%	-\$0.3	-\$0.2	-\$0.2	-\$0.7
Oil and gas extraction	5.7%	-\$0.3	-\$0.1	-\$0.1	-\$0.6
Automotive equipment rental and leasing	15.4%	-\$0.2	-\$0.1	-\$0.1	-\$0.4
Pipeline transportation of natural gas	21.5%	-\$0.1	\$0.0	-\$0.1	-\$0.3
Total, 10 selected industries		-\$11.6	-\$6.7	-\$7.6	-\$26.0

Note: The 10 sub-industries selected for this analysis include sub-industries with like-kind exchange property of at least 5.0% of sub-industry capital stock, and with at least a 1.0% share of economy-wide capital stock. These industries are listed, with their NAICS codes, in Appendix D. Long-run impacts are scaled to the 2013 US economy. Figures may not appear to sum due to rounding. Source: EY analysis.

The largest total change in economic activity would result from the total impact of repeal on the specialty construction trade contractors industry, or \$8.0 billion of GDP each year. The impact on both residential and non-residential real estate also results in a combined loss of \$8.0 billion of GDP annually. Other sub-industries experiencing large negative effects include those related to transportation and equipment/vehicle rental and leasing activity. In total, the GDP decline from the selected sub-industries and related industries would amount to approximately \$26.0 billion annually. Appendix D contains further details on these sub-industries.

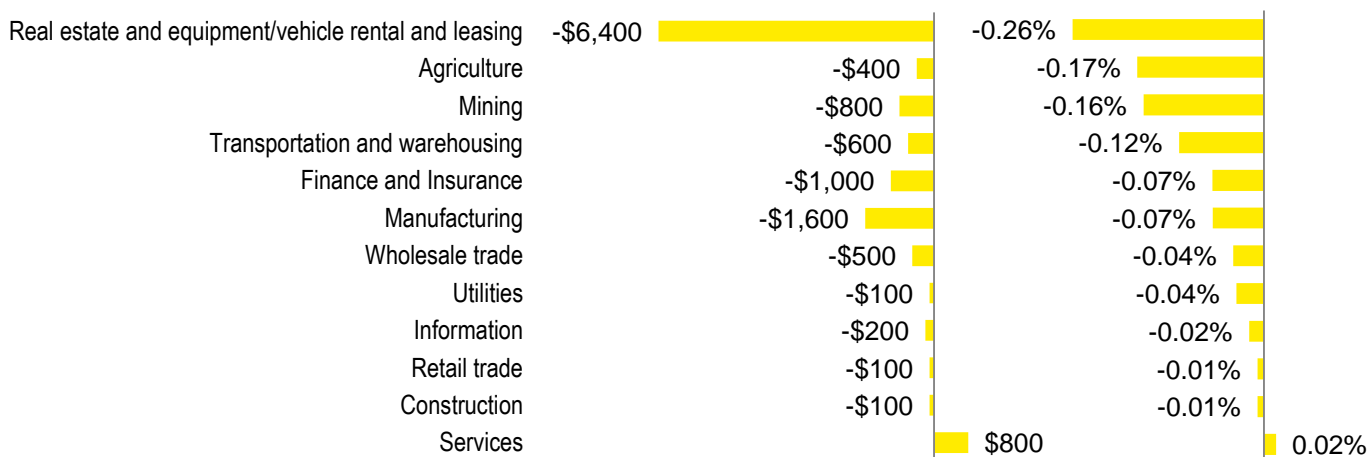
Alternative policy 1: Repeal of like-kind exchange rules paired with increased government spending

Instead of using the increased revenue from the repeal of like-kind exchange rules to lower the corporate income tax rate, this analysis also estimates the impact of using the revenue from repeal to finance an increase in government spending. For this scenario, the government sector is assumed to increase its demand for industry outputs which it then provides as public goods.

Using increased revenue from repeal to finance additional government spending is estimated to have the largest negative impact on GDP of the three scenarios (using the increased tax revenue from repeal to either: reduce corporate income tax rates, increase government spending, or reduce business sector income tax rates). Economy-wide GDP would decline

0.07% (\$13.1 billion scaled to the 2013 US economy) annually in the long run. Approximately \$6.4 billion of this annual decline would come from the real estate and equipment/vehicle rental and leasing industry, as shown in Figure 4. Other sizable annual declines include agriculture (0.17% decline), mining (0.16% decline), and transportation and warehousing (0.12% decline). The only industry that would not decline in GDP under this alternative policy scenario is the services industry.

Figure 4. Long-run effect of repeal on GDP each year in the business sector under revenue-neutral increase in government spending scenario (\$million)



Note: Long-run dollar figures are scaled to the 2013 US economy. The business sector is the combination of the corporate sector (e.g., C corporations) and the pass-through sector (e.g., S corporations, partnerships, limited liability companies, sole proprietorships); it excludes owner-occupied housing.
Source: EY analysis.

The impact of the capital-labor substitution in this scenario is notably more pronounced than under the corporate income tax rate reduction scenario. Specifically, investment declines by 0.28% (\$11.2 billion scaled to the 2013 US economy) and the labor supply increases by 0.01% (16,000 FTE employees scaled to the 2013 US economy). Total labor income declines by 0.07% (\$8.8 billion scaled to the 2013 US economy) due to the decline in after-tax wage. Overall, the macroeconomic impact of the reduced size of the US economy would, in the long-run, result in a decline of \$2.6 billion in federal revenue each year (in 2013 dollars) assuming the federal government loses about 20% for marginal changes in GDP.

Table 9. Long-run effect of repeal on macroeconomic indicators each year under revenue-neutral reduction in increased government spending scenario

	Amount	% change
GDP (\$mil)	-13,100	-0.07%
Consumption (\$mil)	-12,000	-0.11%
Investment (\$mil)	-11,200	-0.28%
Capital stock (\$mil)	-89,300	-0.24%
Labor income (\$mil)	-8,800	-0.07%
After-tax wage	n/a	-0.22%

Note: Long-run dollar figures are scaled to the 2013 US economy.

Source: EY analysis.

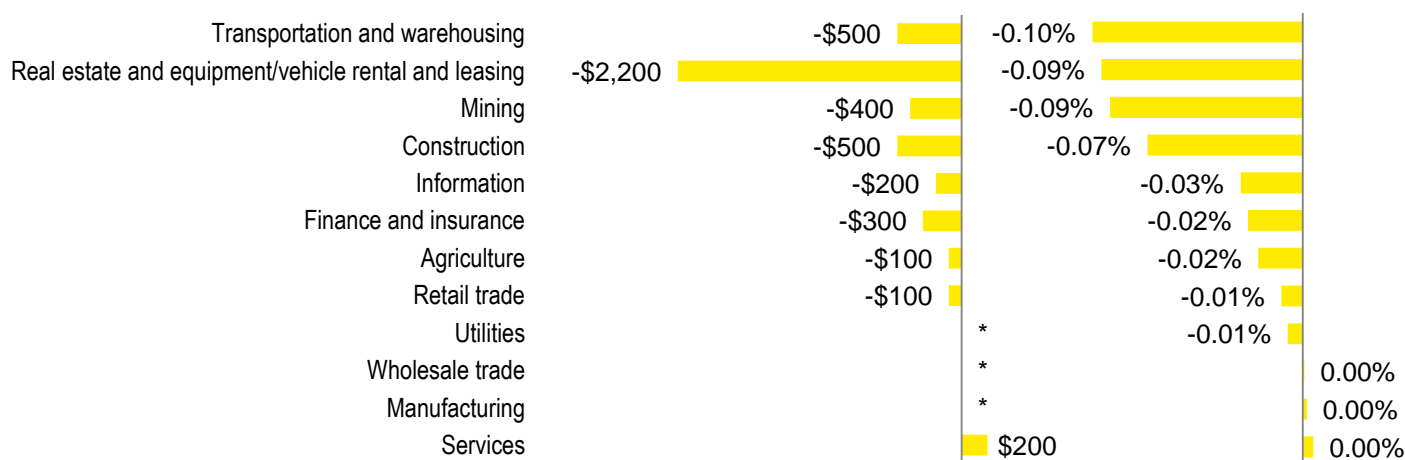
Alternative policy 2: Repeal of like-kind exchange rules paired with reduction in business income tax rates

This analysis also estimates the impact of using the revenue from repeal of the like-kind exchange rules to finance a proportional decrease in both corporate and pass-through income tax rates (i.e., business sector taxes). In contrast to the corporate income tax rate reduction scenario, businesses organized as corporations or pass-through entities would both benefit from the lower business tax rates under this scenario.

Nevertheless, this analysis finds that reducing income taxes on the overall business sector does not outweigh the adverse effects of repealing the like-kind exchange rules. Overall, GDP would decline annually by 0.03% (\$6.1 billion relative to the 2013 US economy). The shifting of economic activity – as measured by GDP – between industries is substantially less pronounced in this scenario as compared to the scenario that only reduces corporate income tax rates. Whereas the economic activity of the manufacturing industry increased by 0.05% in the corporate income tax rate reduction scenario, in this scenario the economic activity of that industry and other industries does not increase.

As displayed in Figure 5, transportation and warehousing GDP would decline annually by a larger proportion than any other industry (0.10%, or \$0.5 billion when scaled to the 2013 US economy). The real estate and equipment/vehicle rental and leasing industry would experience a decline of \$2.2 billion in GDP (0.09% decrease) each year. Sizable annual decreases in economic activity also occur in the mining (0.09% decrease) and construction (0.07% decrease) industries. Other industries would experience smaller changes, with impacts ranging from negligible to a 0.03% decrease.

Figure 5. Long-run effect of repeal on GDP each year in the business sector under revenue-neutral reduction in business sector taxes scenario (\$million)



* GDP impact is less than \$50 million.

Note: Long-run dollar figures are scaled to the 2013 US economy. The business sector is the combination of the corporate sector (e.g., C corporations) and the pass-through sector (e.g., S corporations, partnerships, limited liability companies, sole proprietorships); it excludes owner-occupied housing.

Source: EY analysis.

Similar to the other scenarios, the net increase in the cost of capital relative to the price of labor would induce substitution of labor for capital throughout the US economy. In particular, when the long-run impact is scaled to the 2013 US economy, \$4.8 billion of the \$6.1 billion decline in GDP would come as a result of decreased investment. The labor supply would increase slightly (0.001%, or 1,300 FTE employees), but total labor income would decline by 0.03% (\$3.9 billion relative to the 2013 US economy) due to the decline in the after-tax wage. The magnitude of the reduced size of the US economy would, in the long-run, result in a decline of \$1.2 billion in federal revenue each year (in 2013 dollars) assuming the federal government loses about 20% for marginal changes in GDP. Under this policy, revenue from repeal would result in a 0.6 percentage point decline (1.8% percent) in both the corporate income tax rate and the income tax rate applicable for pass-through entities.²¹

Table 10. Long-run effect of repeal on macroeconomic indicators each year under revenue-neutral reduction in business sector taxes scenario

	Amount	% change
GDP (\$mil)	-6,100	-0.03%
Consumption (\$mil)	-1,300	-0.01%
Investment (\$mil)	-4,800	-0.12%
Capital stock (\$mil)	-40,500	-0.11%
Labor income (\$mil)	-3,900	-0.03%
After-tax wage	n/a	-0.15%

Note: Long-run dollar figures are scaled to the 2013 US economy.

Source: EY analysis.

Sensitivity of macroeconomic impacts to key parameters

Ultimately, the estimated impacts will depend on a combination of the structure of the model and the assumption on how responsive businesses and households are to changes in after-tax rewards, such as the wage rate and the after-tax return to capital. In the baseline simulations this analysis uses parameter values reflecting key business and household behaviors that approximate central tendency estimates from prior research and recent analyses that use models of similar structure. However, uncertainty underlies the exact magnitude of these parameters. This analysis considers the sensitivity of the estimated impacts by assuming sets of “low” and “high” values for these parameters. This approach provides a general sense for the potential variability in estimated results that could result from alternative views on how responsive businesses and households might be to changes in tax policy.

The key model parameters chosen for the baseline, high, and low scenarios are each in the range of parameters reported in a recent CRS review of economic models of similar structure to the EY GE Model.²² Specifically, for recent models of this type, the parameter range is 0.25 to 0.50 for the intertemporal elasticity of substitution, 0.50 to 1.00 for the intratemporal elasticity of substitution, and 0.30 and 0.60 for the leisure share of time endowment.²³

An examination of the sensitivity of the estimated macroeconomic impacts to key model parameters is presented in Table 11. For comparison purposes, the previously discussed baseline impacts are reported in addition to the low and high scenarios. Note that the impacts below are for the primary policy change considered in this analysis, the repeal of like-kind exchange rules paired with a revenue-neutral reduction in the corporate income tax rate.

The GDP results are bounded between a 0.040% decrease (low responsiveness) and 0.048% decrease (high responsiveness) encompassing the baseline result of a 0.044% decrease in the long-run. Similar results are estimated for the other macroeconomic indicators. Investment, for example, decreases by 0.163% in the low responsiveness scenario and 0.190% in the high responsiveness scenario relative to the baseline result of a 0.177% decrease.

Table 11. Sensitivity of macroeconomic impacts to key model parameters

	Baseline	High	Low
<u>Key model parameters</u>			
Rate of time preference	0.011	0.018	0.003
Intertemporal elasticity of substitution (EOS)	0.40	0.50	0.30
Intratemporal EOS (between consumption and leisure)	0.80	0.95	0.65
Leisure share of time endowment	0.30	0.40	0.20
Portfolio elasticity for capital	3.00	4.50	1.50
Population growth rate	0.015	0.015	0.015
Technological growth rate	0.019	0.019	0.019
Business sector capital income share (average)	0.25	0.25	0.25
Business sector debt-to-capital ratio (average)	0.33	0.33	0.33
Business sector EOS between capital and labor (average)	0.66	0.66	0.66
EOS between corporate and pass-through capital	2.00	2.00	2.00
<u>Macroeconomic impact</u>			
GDP	-0.04%	-0.05%	-0.04%
Consumption	-0.01%	-0.01%	-0.01%
Investment	-0.18%	-0.19%	-0.16%
Capital stock	-0.15%	-0.16%	-0.14%
Labor supply	0.002%	0.001%	0.002%
Labor income	-0.01%	-0.02%	-0.010%
After-tax wage	-0.18%	-0.18%	-0.17%

Note: The rate of time preference is chosen to maintain a constant capital income share across sensitivity scenarios. The macroeconomic impact is presented for the main policy simulation of the repeal of like-kind exchange rules coupled with a revenue-neutral corporate income tax rate reduction. Source: EY analysis.

V. Limitations and caveats

Any modeling effort is only a rough approximation of potential impacts, and the modeling used for this analysis no exception. Although various limitations and caveats might be added to the analysis, several are particularly noteworthy:

- ▶ **Estimates based on stylized depiction of the US economy.** The general equilibrium model used for this analysis is, by its very nature, a highly stylized depiction of the US economy intended to capture key details important to analyzing the impact of a potential tax policy change.
- ▶ **US on a fiscally sustainable path.** The model assumes the United States is on a fiscally sustainable path under current law and remains on a fiscally sustainable path after the policy change, when neither may necessarily be the case.
- ▶ **Estimates limited by calibration.** This model is calibrated to the recent US economy (in 2013) and, because any particular year contains unique events, no particular baseline year is completely generalizable.
- ▶ **US industries responsive to normal returns on investment.** The industries comprising the US economy in this model are assumed to be responsive to the normal returns on investment. This contrasts to industries that earn economic profits and thereby have an increased sensitivity to statutory tax rates relative to METRs.
- ▶ **Estimates are limited by available public information.** The analysis relies on information reported by federal government agencies (primarily the Bureau of Economic Analysis, the Bureau of Labor Statistics, and US Census Bureau) and aggregate industry- and sector-level tax return information (from the IRS). The analysis did not attempt to verify or validate this information using sources other than those described in the report.

VI. Summary

Recent tax reform plans have included provisions to limit or repeal the use of IRC Section 1031 like-kind exchange rules to help finance lower tax rates. An important aspect of tax reform, however, is carefully balancing competing objectives: While lower tax rates themselves can help encourage greater economic growth, how such lower tax rates are financed can also impact economic growth.

This analysis examines the macroeconomic impact of repealing the like-kind exchange rules paired with alternative uses of the revenue – a lower corporate income tax rate, higher government spending, and a lower corporate income tax rates and tax rates applied to pass-through income. The analysis finds that repeal of the like-kind exchange rules increases the cost of capital in the economy, even when combined with lower tax rates. The higher cost of capital is found to discourage business investment which adversely affects the overall economy. Repeal is found to negatively affect the economy across different uses of the associated revenue and under a range of modeling assumptions.

The repeal of the like-kind exchange rules is also found to increase holding periods for assets and increase reliance on debt finance. Longer holding periods reduce the velocity of investment and means that capital is redeployed in the economy more slowly. This lock-in effect translates into a capital stock that is less efficiently allocated and less productive over time.

The impacts and potential dislocations are larger for those parts of the economy with greater reliance on the like-kind exchange rules such as the specialty construction trades, non-residential and residential real estate and truck transportation.

Understanding the potential impact and tradeoffs associated with using the revenue from specific provisions, such as the repeal of the like-kind exchange rules, is an important consideration in designing a pro-growth tax reform plan.

Appendix A. EY General Equilibrium Model of the US Economy

The EY General Equilibrium Model of the US Economy was used to estimate the long-run macroeconomic impacts associated with the repeal of like-kind exchange rules. In this model tax policy affects the incentives to work, save and invest, and allocate capital and labor among competing uses. Representative individuals and firms incorporate the after-tax return from work and savings into their decisions of how much to produce, save, and work.

The general equilibrium methodology accounts for changes in equilibrium prices in factor (i.e., capital and labor) and goods markets and simultaneously accounts for the behavioral responses of individuals and businesses to changes in the tax treatment of capital qualifying for the use of like-kind exchange rules. Behavioral changes are estimated in the OLG framework, whereby representative individuals incorporate changes in current and future prices when deciding how much to consume and save in each period of their life. The EY General Equilibrium Model of the US Economy is similar to those that have been used by the CBO, JCT, and US Treasury Department.²⁴

An overview of the model follows:

Production

Firm production is modeled with a constant elasticity of substitution (CES) functional form in which firms choose the optimal level of capital and labor subject to the gross-of-tax cost of capital and gross-of-tax wage. The model includes industry-specific detail for more than 30 industries through use of differing elasticities of substitution between capital and labor, factor-intensities, and scale parameters. Such a specification accounts for differential use of capital and labor between industries as well as distortions in factor prices introduced by the tax system. Further, the production of each industry is modeled for both the corporate and pass-through sectors; each industry is responsive to changes in the relative cost of capital by organizational form and allocates production between the corporate and pass-through sectors.

The industry detail included in this model corresponds approximately with 2- to 3-digit North American Industry Classification System (NAICS) codes and is calibrated to a stylized version of the 2013 US economy. Additional industry-specific modeling is included in computing the gross-of-tax cost of capital by industry as the US tax code discriminates by asset type, organizational form, and source of finance. Specifically, each industry differs in its mix of capital types, concentration of corporate versus pass-through organizational form, and debt-equity ratio. Additional detail on the computation of the gross-of-tax cost of capital is included in Appendix B.

Because industry outputs are typically a combination of value added (i.e., the capital and labor of an industry) and the finished production of other industries (i.e., intermediate inputs), each industry's output is modeled as a fixed proportion of an industry's value added and intermediate inputs to capture inter-industry linkages. These industry outputs are then bundled together into consumption goods that are purchased by consumers.

Consumption

Consumer behavior is modeled through use of an OLG framework that includes 55 generational cohorts (representing adults age 21 to 75). Thus, in any one year, the model includes a representative individual optimizing lifetime consumption and savings decisions for each age 21 through 75 (i.e., 55 representative individuals). For each generational cohort the endowment of human capital changes with age – growing early in life and declining later in life – following the estimate of Altig et al. (2001). The endowment of human capital is assumed to grow between generational cohorts at an assumed rate of technical progress (1.9%). Additionally, the population of the United States is assumed to grow at the rate of 1.5% implying that each generational cohort is 1.5% larger than that born in the previous year.

The utility of representative individuals is modeled as a CES function allocating a composite commodity consisting of consumption goods and leisure over their lifetimes. Representative individuals optimize their lifetime utility through their decisions of how much to consume, save, and work in each period subject to their preference parameters and the after-tax returns from work and savings in each period. In determining their labor supply, representative individuals respond to the after-tax return to labor, as well as their overall income levels, in determining whether to work and thereby earn income that is used to purchase consumption goods or to consume leisure by not working.

Other features

The model includes a simple characterization of the government. Government spending is assumed to be used for either (1) transfer payments to representative individuals or (2) the provision of public goods. Public goods are assumed to be provided by the government through the purchase of industry outputs as specified in a Cobb-Douglas function. This spending is financed in the model by collecting corporate income, individual income, and payroll taxes. Tax policy changes are assumed to be offset by a contemporaneous and offsetting change in government spending or taxes.

Additionally, international capital flows are modeled through the constant portfolio elasticity approach of Gravelle and Smetters (2006). This approach assumes that international capital flows are responsive to the difference in after-tax rates of return in the United States and the rest of the world through a constant portfolio elasticity expression. This approach represents a compromise between the closed economy approach and the alternative of a small open economy in which capital is perfectly mobile and the international after-tax return to capital is fixed. The model also captures the impact of the corporate income tax on income shifting between the United States and the rest of the world.

Appendix B. Description of the cost of capital model

The cost of capital for an investment is estimated using the framework first formalized by Hall and Jorgenson (1967) and later refined by Fullerton and King (1984) and described in detail by Gravelle (1994) and Mackie (2002). The cost of capital (net of depreciation) is given by:

$$c = \frac{(r + \delta - \pi)(1 - uz)}{1 - u} - \delta$$

where c denotes the cost of capital, r is the firm's nominal after-tax discount rate, δ is the rate at which the asset depreciates, π is the rate of inflation, u is the corporate income tax rates, and z is the present value of depreciation allowances. The present value of depreciation, z , reflects the discount rate, the tax life of an asset, the depreciation schedules, and other elements of the depreciation system. The values of δ and z vary by type of asset as depreciation allowances for equipment are typically accelerated as compared to their economic lives. This cost of capital concept is frequently used by the Congressional Budget Office, Congressional Research Service, Joint Committee on Taxation, and US Department of the Treasury to quantify the impact of tax changes on investment incentives.

Investor-level taxes and the deductibility of interest are accounted for by assuming that a firm can arbitrage between debt and real capital following Fullerton and Bradford (1981) and Fullerton, Gillette, and Mackie (1987). Investments are frequently financed with both debt and equity financing. Thus, this study calculates the cost of capital for a hypothetical new investment based on a weighted average of debt and equity financing.²⁵

A further issue involves a firm's marginal source of equity finance; that is, whether the old or new view of dividend taxes applies. This analysis follows Auerbach and Hassett (2003) and assumes that one-half of equity finance operates under the old view, whereby dividend taxes affect investment decisions, and the other half of firms operate under the new view, whereby firms rely on retained earnings as the marginal source of finance and dividend taxes are capitalized into firm value.²⁶

The cost of capital for equity-financed investment includes the investor-level taxes on capital gains and dividends (i.e., the double tax on corporate profits), whereas the cost of capital for debt-financed investment reflects the deductibility of interest at the corporate level and the assumption that approximately one-half of debt holders are either tax-exempt or lightly taxed (e.g., pension assets/foreigners).

Although the standard cost of capital framework typically uses the simplifying assumption that firms do not sell used capital – and, consequently, are not subject to the capital gains taxation on that sale – its modeling is of central importance to an analysis of the repeal of like-kind exchange rules. That is, the repeal of like-kind exchange rules would subject the sale of used capital to current capital gains taxation. Accordingly, this analysis uses the modified cost of capital (net of depreciation) equation incorporating capital gains taxation from the sale of used capital derived in Auerbach (1981) and generalized by Hassett and Viard (2007):

$$c = \frac{r - \pi + \delta}{1 - u} \left[1 - \left(\frac{1 - \delta}{1 + r - \pi} \right) \right]^{-1} \left[1 - uz(T) - (u - \gamma)d(T) - (1 - \gamma) \left(\frac{1 - \delta}{1 + r - \pi} \right)^T - \gamma b(T) \right] - \delta$$

where T is the holding period of the capital, $z(T)$ is the present value of depreciation allowances for a sale in period T , γ is the capital gains tax rate applied to the sale, $d(T)$ is the present value of depreciation recapture for a sale in period T , and $b(T)$ is the present value of the basis deduction allowed for a sale in period T .

Appendix C. Businesses' views on the effects of repealing like-kind exchange rules

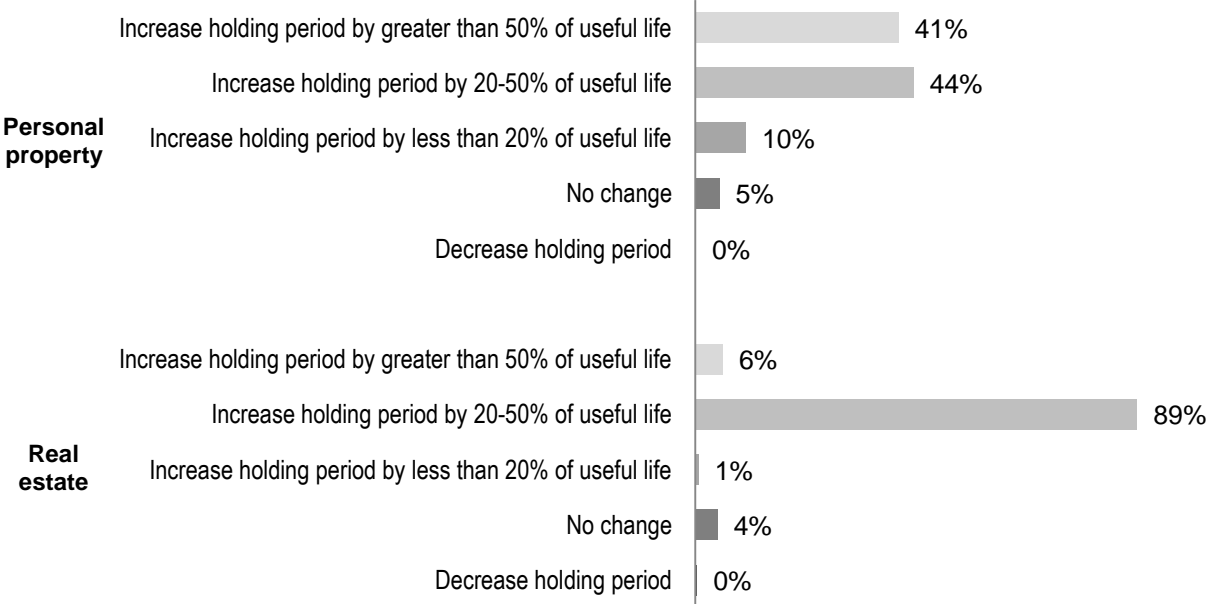
The members of several trade associations were surveyed to assist with understanding how repealing like-kind exchange rules would affect businesses' decision-making.²⁷ Further, the survey's findings enable a more accurate analysis of the effect of repeal on US economic activity and federal tax revenue. Over 200 businesses responded to the survey. Notable findings are discussed below.

Asset holding periods

Under current law, through the use of like-kind exchanges, a business can defer recognizing a taxable gain when reinvesting in a qualifying asset. However, without the availability of like-kind exchange rules, a typical business engaging in like-kind exchanges would hold assets for a longer period before sale. Doing so would allow the business to defer its recognition of a gain and the resulting tax to a later time. Under current law, with no immediate tax payable, holding the asset for a longer period was not economically desirable.

Data collected by the survey suggest that, in most cases, businesses would choose to hold assets for substantially longer if like-kind exchange rules are repealed. Figure C-1 shows that respondents representing large majorities of both personal property and real estate like-kind exchange activity expect that asset holding periods would increase by more than 20% under repeal.

Figure C-1. Expectations for how holding periods would be affected by the repeal of like-kind exchange rules



Note: Responses are weighted by the fair market value of property exchanged as part of a like-kind exchange by the respondent's business or client.

Source: Survey of the members of nine trade associations conducted by EY. 221 businesses that conducted, brokered, or advised like-kind exchanges responded to the survey.

In particular, respondents representing approximately 41% of personal property like-kind exchange activity expect that holding periods would increase by more than 50%. Respondents representing nearly 90% of real estate like-kind exchanges expect that holding periods would increase by between 20% and 50% of the asset’s useful life.

As shown in Table C-1, respondents expect the average holding period of personal property to increase by approximately one year. The average real estate holding period is expected to lengthen by more than three years. These results are a key input in modeling the cost of capital for assets currently qualifying for like-kind exchanges but would be subject to taxation upon reinvestment with repeal.

Table C-1. Expectations for how holding periods would be affected by the repeal of like-kind exchange rules

Asset type	Current law	Repeal	Expected increase
Personal property	2 years, 4 months	3 years, 4 months	42%
Real estate	8 years, 6 months	11 years, 7 months	37%

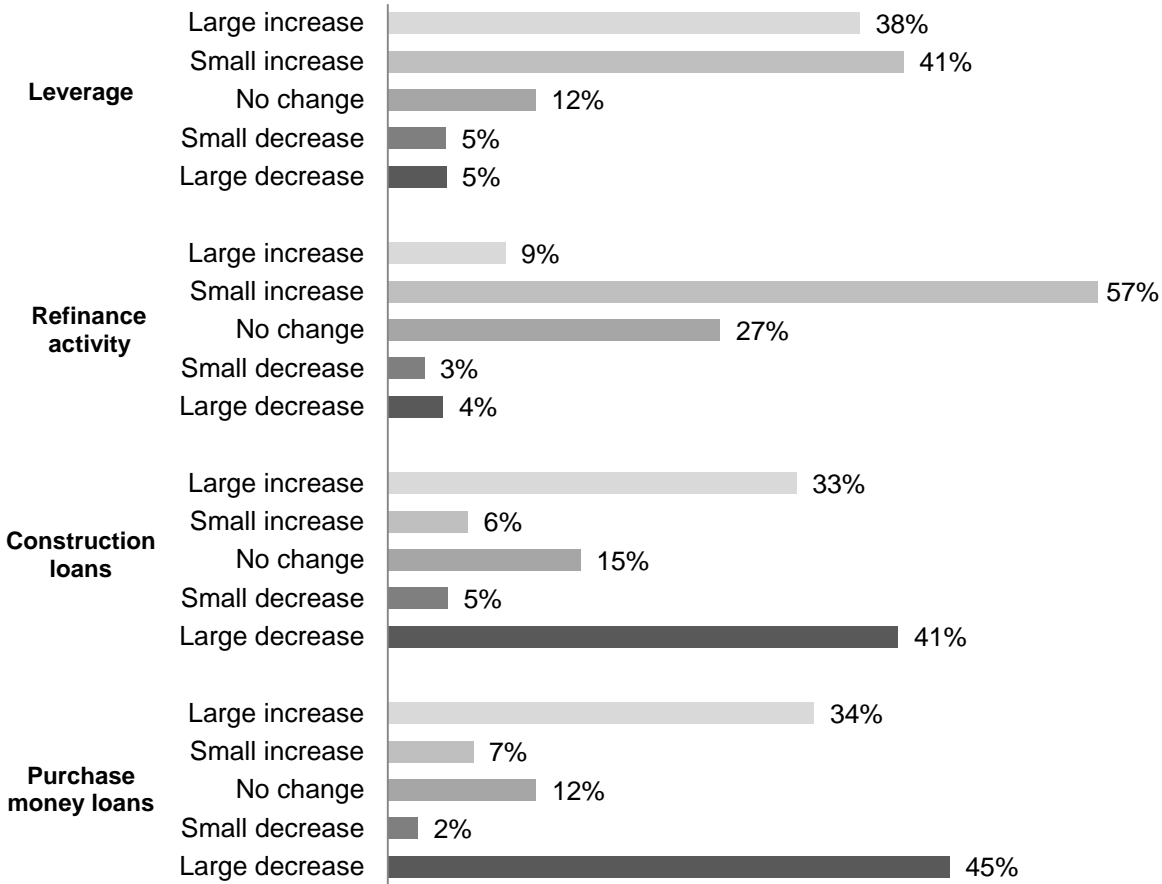
Note: Responses are weighted by the fair market value of property exchanged as part of a like-kind exchange by the respondent’s business or client.
 Source: Survey of the members of nine trade associations conducted by EY. 221 businesses that conducted, brokered, or advised like-kind exchanges responded to the survey.

Debt financing levels

Income taxation is a tax on equity financing. Typically, tax is owed when the gains are realized by, for example, selling the asset. Under existing like-kind exchange rules businesses are able to defer taxation when reinvesting the proceeds from their asset sales into qualifying assets. However, the repeal of like-kind exchange rules would require businesses to pay tax upon sale, thus increasing the cost of equity financing. As the cost of equity financing increases, the use of debt financing becomes relatively less expensive. Consequently, businesses may increase their leverage by borrowing funds.

As shown in Figure C-2, respondents representing nearly 80% of like-kind exchange activity expect that overall leverage would increase in response to the repeal of like-kind exchange rules. Respondents representing nearly two-thirds of like-kind exchange activity expect that refinancing activity would increase as businesses obtain a greater share of financing from debt.

Figure C-2. Expectations for how debt financing levels would be affected by the repeal of like-kind exchange rules



Note: Responses are weighted by the fair market value of like-kind exchange activity reported by the respondent’s business or client.
 Source: Survey of 17 trade associations conducted by EY. 221 businesses that conducted, brokered, or advised like-kind exchanges responded to the survey.

However, respondents were divided on how loans used in acquiring real estate would be affected by repeal. Respondents representing 33% of like-kind exchange activity expect a large increase in construction loans, compared with 41% expecting a large decrease in construction loans. Expectations for purchase money loans were similarly split: respondents representing 34% of like-kind exchange activity expect a large increase, while respondents representing 45% of activity expect a large decrease. Generally, survey respondents focused on personal property exchanges expected increases in construction loans and purchase money loans under repeal. Respondents mainly involved in real estate transactions expected decreases in these loans.

Appendix D. Sub-industries highly affected by the repeal of like-kind exchange rules

Section IV of this study includes an analysis of the GDP impact of repeal on 10 selected sub-industries. The sub-industries, described in Table D-1, have like-kind exchange property of at least 5.0% of sub-industry capital stock and have at least a 1.0% share of economy-wide capital stock.

Table D-1. Descriptions of sub-industries selected for further analysis

NAICS code	Sub-industry
2111	Oil and gas extraction This industry comprises establishments primarily engaged in operating and/or developing oil and gas field properties and establishments primarily engaged in recovering liquid hydrocarbons from oil and gas field gases.
237	Heavy and civil engineering construction The Heavy and Civil Engineering Construction subsector comprises establishments whose primary activity is the construction of entire engineering projects (e.g., highways and dams), and specialty trade contractors, whose primary activity is the production of a specific component for such projects.
238	Specialty construction trade contractors The Specialty Trade Contractors subsector comprises establishments whose primary activity is performing specific activities (e.g., pouring concrete, site preparation, plumbing, painting, and electrical work) involved in building construction or other activities that are similar for all types of construction, but that are not responsible for the entire project.
481	Air transportation Industries in the Air Transportation subsector provide air transportation of passengers and/or cargo using aircraft, such as airplanes and helicopters.
484	Truck transportation Industries in the Truck Transportation subsector provide over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers.
4862	Pipeline transportation of natural gas This industry comprises establishments primarily engaged in the pipeline transportation of natural gas from processing plants to local distribution systems.
531*	Non-residential real estate The non-residential real estate sub-industry includes lessors of non-residential buildings, miniwarehouses, and self-storage units; non-residential property managers; and other activities related to real estate.
531*	Residential real estate The residential real estate sub-industry includes lessors of residential buildings and dwellings, residential property managers, and offices of real estate agents and brokers.
5321	Automotive equipment rental and leasing This industry group comprises establishments primarily engaged in renting or leasing the following types of vehicles: passenger cars and trucks without drivers, and utility trailers.
5324	Commercial and industrial machinery and equipment rental and leasing This industry group comprises establishments primarily engaged in renting or leasing commercial-type and industrial-type machinery and equipment.

* The real estate industry (NAICS 531) was apportioned into non-residential and residential real estate using sub-industry payroll data available from US Census Bureau County Business Patterns data.
Source: US Census Bureau; EY analysis.

Endnotes

¹ Internal Revenue Code § 1031.

² Treas. Reg. section 1.1031(a)-2(a) and (b).

³ US Department of the Treasury, *The Tax Treatment of Like Kind Exchanges*, 2014.

⁴ US Department of the Treasury, *The Tax Treatment of Like Kind Exchanges*, 2014.

⁵ *Starker vs. United States*, 602 F.2d 1341 (1979).

⁶ Page 440, "Committee Print on Tax Expenditures."

⁷ Internal Revenue Service (IRS) data, US Census Bureau's Annual Capital Expenditures Survey, and EY analysis. Weighted averages of these data are used to smooth year-to-year variation.

⁸ The increase in the holding period of the mining equipment reflects the findings of a survey of the members of nine trade associations conducted by EY. These findings, and others, are summarized in Appendix C.

⁹ This case study assumes that the increased tax revenue resulting from repeal would be used to reduce the corporate income tax rate from 35.0% to 33.6%. As a revenue-neutral tax rate reduction, the decreased corporate income tax revenue would exactly offset the increased tax revenue from repeal; the net effect would be no change in federal tax revenue.

¹⁰ The increase in the holding period of the apartment building reflects the findings of a survey of the members of nine trade associations conducted by EY. These findings, and others, are summarized in Appendix C.

¹¹ For example, see White House, *President's Framework for Business Tax Reform*, February 2012; Jane Gravelle and Donald Marples, *Tax Rates and Economic Growth*, December 2011; US Department of the Treasury, *Approaches to Improve the Competitiveness of the U.S. Business Tax System for the 21st Century*, December 2007; Congressional Budget Office, *Taxing Capital Income: Effective Rates and Approaches to Reform*, October 2005; The President's Advisory Panel on Federal Tax Reform, *Simple, Fair, & Pro-Growth: Proposals to Fix America's Tax System*, November 2005; US Department of the Treasury, *Report to the Congress on Depreciation Recovery Periods and Methods*, July 2000; James Mackie, (2002), "Unfinished Business of the 1986 Tax Reform Act: An Effective Tax Rate Analysis of Current Issues in the Taxation of Capital Income," *National Tax Journal*, Vol. 45(2), June, pp. 293-337.

¹² Businesses may also be subject to section 1245 or 1250 recapture.

¹³ For a discussion of the economic literature on how taxation impacts leverage decisions, see Ruud de Mooij, (2011), "The Tax Elasticity of Corporate Debt: A Synthesis of Size and Variations," IMF Working Papers 11/95, International Monetary Fund. This analysis uses an elasticity of 0.25 for both corporate and pass-through entities. This implies, for example, that a 10 percentage-point increase in the statutory tax rate would result in a 2.5 percentage point increase in a business' debt-equity ratio. This elasticity is used by this analysis to estimate the increase in leverage for investment qualifying for like-kind exchange rules under current law and applied to the deferral-adjusted average marginal tax rate for recognized gains under repeal.

¹⁴ 2013 is the most recent year for which BEA data are available in sufficient detail to conduct this analysis.

¹⁵ See, for example, Shinichi Nishiyama, "Fiscal Policy Effects in a Heterogeneous-Agent Overlapping-Generations Economy With an Aging Population," Congressional Budget Office, Working Paper 2013-07, December 2013, Joint Committee on Taxation, *Macroeconomic Analysis of the "Tax Reform Act of 2014,"* February 2014 (JCX-22-14), Joint Committee on Taxation, *Macroeconomic Analysis of Various Proposals to Provide \$500 Billion in Tax Relief*, March 2005 (JCX-4-05), and The President's Advisory Panel on Federal Tax Reform, *Simple, Fair, & Pro-Growth: Proposals to Fix America's Tax System*, November, 2005.

¹⁶ Changes in the deficit can generally only be reflected in models of this type for a fixed duration of time because they ultimately would result in offsetting changes in taxes or spending that return the federal government to a fiscally sustainable path. A fiscally sustainable path is can be viewed as, from the context of the model, as a level of debt-to-GDP that is roughly constant over time (e.g., neither rising nor falling over time).

¹⁷ Economic welfare is also estimated to decline in these scenarios (e.g., the overall increase in the cost of capital has a larger negative impact on economic welfare than the positive impact of a reduction in the tax-induced capital misallocation between the corporate and pass-through sectors in the revenue-neutral corporate income tax rate reduction scenario).

¹⁸ It is not uncommon for estimates of the change in labor supply to show an increase in simulations for this type of policy change in this type of model. As the price of capital increases relative to the price of labor, there can be a shift from capital to labor (e.g., a decline in the capital labor ratio) as the capital intensity of the economy falls somewhat.

¹⁹ The revenue raised from repeal of like-kind exchange rules would be exactly offset by the reduction in revenue from lowering the corporate income tax rate from 35.0% to 33.6%.

²⁰ Estimates of the percent change in the gross cost of capital are used to compute the direct effect on industries excluding any general equilibrium or revenue-use impacts. The estimates presented in the text assume an elasticity of investment with respect to the gross cost of capital of -0.835. Reviews of this literature have found that the elasticity of investment with respect to cost of capital is typically estimated to be between -0.5 and -1.0. That is, the literature suggests that a 10% increase in the cost of capital would result in a 5% to 10% decrease in investment. For a review of this literature see Kevin Hassett and Glenn Hubbard, (2002), "Tax policy and business investment" in M. Feldstein and A. Auerbach (eds.), *Handbook of Public Economics*, Vol. 3, Elsevier North Holland, pp. 1293-1343 and Ruud de Mooij and Sjeef Ederveen, (2008), "Corporate tax elasticities: a reader's guide to empirical findings," *Oxford Review of Economic Policy*, 24(4), pp. 680-697. The particular elasticity used in this analysis comes from Simeon Djankov, Tim Ganser, Caralee McLiesh, Rita Ramalho, and Andrei Shleifer, (2010), "The Effect of Corporate Taxes on Investment and Entrepreneurship," *American Economic Journal* 2(3), pp. 31-64. Indirect and induced effects are estimated using economic multipliers from the IMPLAN input-output model. IMPLAN is used by more than 500 universities and government agencies to estimate the economic and fiscal impacts of new investments and changes in demand and industry output.

²¹ The corporate income tax rate would decline from 35.0% to 34.4% – a 1.8% decline in percentage terms. The average marginal tax rate on pass-through business income would decline from 36.5% to 35.9% – also a 1.8% decline in percentage terms. With these tax rate reductions, the decline in business tax revenue would exactly offset the increase in tax revenue from repeal of like-kind exchange rules.

²² See Jane Gravelle, "Dynamic Scoring for Tax Legislation: A Review of Models," Congressional Research Service, January 2014.

²³ Additionally, the implied Frisch elasticity is 0.29, which is within the range of parameter values used in recent models of similar structure presented in Gravelle (2014) of 0.18 and 0.71.

²⁴ See, for example, Shinichi Nishiyama, "Fiscal Policy Effects in a Heterogeneous-Agent Overlapping-Generations Economy With an Aging Population," Congressional Budget Office, Working Paper 2013-07, December 2013, Joint Committee on Taxation, *Macroeconomic Analysis of the "Tax Reform Act of 2014,"* February 2014 (JCX-22-14), Joint Committee on Taxation, *Macroeconomic Analysis of Various Proposals to Provide \$500 Billion in Tax Relief*, March 2005 (JCX-4-05), and The President's Advisory Panel on Federal Tax Reform, *Simple, Fair, & Pro-Growth: Proposals to Fix America's Tax System*, November, 2005.

²⁵ This and many other assumptions are based on James Mackie, (2002), "Unfinished Business of the 1986 Tax Reform Act: An Effective Tax Rate Analysis of Current Issues in the Taxation of Capital Income," *National Tax Journal*, 45(2), pp. 293-337.

²⁶ More recent empirical research suggests that the new view may be more prevalent among firms; see Kevin Hassett and Kathryn Newmark, (2008), "Taxation and Business Behavior: A Review of the Recent Literature," *Fundamental Tax Reform: Issues, Choices and Implications*, MA: MIT Press.

²⁷ Trade associations whose members were surveyed include the following: American Car Rental Association, American Rental Association, American Senior Housing Association, American Trucking Association, Asian American Hotel Owners Association, Associated Equipment Distributors, Commercial Real Estate Development Association, Equipment Leasing and Finance Association, Federation of Exchange Accommodators, International Council of Shopping Centers, National Alliance of Forest Owners, National Association of Real Estate Investment Trusts, National Multifamily Housing Council, and the Real Estate Roundtable.