

The Benefits and Costs of Tax Deferral: An Analysis of Real Estate Tax-Deferred Exchanges

*David Barker, * David C. Ling, ** and Milena Petrova ****

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Abstract

We examine the effects of Section 1031 of the Internal Revenue Code on commercial real estate investors and markets, as well as U.S. Treasury revenue. We first develop a partial equilibrium model that quantifies the present value of an exchange, relative to a fully taxable sale, to the property owner. In addition to capturing the benefit of immediate tax deferral, the model incorporates the reduced depreciation deductions in the replacement property and the increased capital gain and depreciation recapture taxes that occur when the replacement property is sold. These disadvantages are often ignored by focusing on the immediate tax deferral. We estimate that the incremental present value of a CRE exchange, as a percentage of the price of the replacement property, ranges from less than one percent to approximately eight percent, depending on the taxpayer's marginal tax rates, the holding period of the disposed property, the magnitude of price appreciation experienced by the disposed property prior to the exchange, and the amount of time the investor expects to hold the replacement property prior to disposition in a fully taxable sale. We then discuss the extent to which these incremental NPVs can be used as estimates of the likely effects that elimination of CRE exchanges would have on local market values. Finally, we investigate the likely effects of elimination on U.S. Treasury revenue. Repeal appears likely to generate less than \$500 million per year to the Treasury.

*Adjunct Professor, Tippie College of Business, University of Iowa, Iowa City, IA 52242, phone: (319) 338-1167, email: david-barker@uiowa.edu; **McGurn Professor of Real Estate, Hough Graduate School of Business, University of Florida, Gainesville, FL 32611-7168, phone: (352) 273-0313, email: ling@ufl.edu; ***Associate Professor, Department of Finance, Whitman School of Management, Syracuse University, Syracuse, NY 13244; email: mpetrova@syr.edu.

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The Benefits and Cost of Tax-Deferral: An Analysis of Section 1031 Real Estate Exchanges

I. INTRODUCTION

Section 1031 of the Internal Revenue Code permits corporate and individual taxpayers to defer the recognition of taxable gains on the disposition of business-use or investment assets. By deferring tax liabilities, investors reduce the effective tax rate on the investment and their tax-adjusted user cost of capital, which promotes investment in the asset class.¹ Section 1031 exchanges are widely used, especially in states with high income tax rates. In 2004, an estimated 80 percent of commercial real estate (CRE) transactions on the West Coast of the U.S. involved the use of an exchange by the seller, buyer, or both (McLinden, 2004). Between 1999 and 2005, Ling and Petrova (2008) report that 32 percent of the apartment transactions in their database involved an exchange; the corresponding percentage for their office sample was 20 percent. JCT (2017) estimates the cost of this tax preference item to be \$90 billion over 2016-2020.

To the extent the use of tax-deferred exchanges leads to reductions in the present value of federal and state income taxes, theory suggests exchanges are associated with asset price and liquidity effects. For example, several studies show that capital gain tax rate reductions are associated with increased asset prices (Lang and Shackelford, 2000; and Guenther and Willenborg, 1999). Another stream of literature establishes strong support for the presence of a “lock-in” effect; that is, investors are less likely to sell and realize gains when capital gain taxes are high (Malkiel and Kane, 1963; Feldstein et al. 1980; Klein, 1999, 2001; Shackelford and Verrecchia, 2002; Mackie, 2002, Ivkovich et al., 2005). Lock-in can reduce economic efficiency because investors differ in the skills and strategies they use to manage assets in their portfolios, and the suitability of particular investments for investors changes over time. Rather than disposing of suboptimal assets, signaled by assets’ lower expected before-tax returns, and reinvesting the proceeds in more productive (higher return) assets, investors with accrued capital gains may choose to continue to hold less productive assets rather than realize the taxable gains. This suboptimal allocation of scarce investment capital exacts a cost on the economy as well as on the taxpayer.

¹ According to recent empirical studies, the elasticity of investment with respect to tax-adjusted user cost of capital ranges between -0.25 and -1 (Hassett and Hubbard, 2002 and Hassett and Newmark, 2008).

Notwithstanding the potential advantages of tax-deferral, Section 1031 exchanges have several drawbacks that limit their attractiveness. First, the larger the amount of tax-deferral, the smaller is the depreciable basis in the replacement property and, therefore, the smaller is the allowable annual deduction for depreciation in the replacement property. Another disadvantage is that the transaction costs associated with initiating and completing an exchange may exceed the transaction costs of a fully taxable sale. Finally, Section 1031 does not allow for the recognition of a loss for tax purposes.

Despite their widespread use, careful estimates of the present value of exchange-related tax saving are lacking. Moreover, the economic rationale associated with providing enhanced capital gain deferral benefits to some assets and not others (such as stocks and bonds) has been questioned by academics and practitioners (e.g., Jensen, 1985; Shaviro, 1992; Sullivan, 2015). Perhaps for this reason, as well as their perceived cost to the Treasury, successive budgets put forth by the Obama administration and several tax reform proposals from Congressional tax-writing committees called for the elimination or curtailment of like-kind exchanges.² Experts currently differ on the likely intentions of the Trump administration regarding like-kind exchanges,³ although many believe Congress is likely to eliminate this perceived tax break.⁴

We study the effects of Section 1031 exchanges on commercial real estate (CRE) markets and the present value of U.S. Treasury revenues. We first develop a partial equilibrium (“micro”) model that quantifies the present value of an exchange, relative to a fully taxable sale, to the property owner. In addition to capturing the benefit of immediate tax deferral, the model incorporates the corresponding tax disadvantages of an exchange from the investor’s perspective: reduced depreciation deductions in the replacement property and increased capital gain and depreciation recapture taxes if/when the replacement property is sold. These significant disadvantages are often ignored by a focus on immediate tax deferral. We estimate that the incremental present value of a CRE exchange, as a percentage of the price of the replacement property, ranges from 0.4 percent

² For example, on February 26, 2014, House Ways & Means Committee Chairman David Camp released a comprehensive tax reform proposal that called for repeal of Section 1031 in its entirety. In December of 2014, Senate Finance Chairman Max Baucus put forth a discussion draft that also proposed the complete elimination of Section 1031. In the last (114th) Congress, Sen. Bernie Sanders introduced legislation based on President Obama's proposal to cap 1031 deferred gains at \$1 million annually. Sen. Hillary Clinton put forward a 1031 limitation proposal as part of her tax plan during the 2016 presidential campaign. President Obama’s Section 1031 budget proposals can be found in Treasury's explanation of revenue proposals for the FY 2017 budget (available on Treasury Office of Tax Policy website). In the current Congress, we are not aware of any specific legislation touching section 1031.

³ See Sperance (2017).

⁴ See Grant and Rubin (2017).

to 7.8 percent, depending on the taxpayer's marginal tax rates, the holding period of the relinquished property, the amount of price appreciation experienced by the relinquished property prior to the exchange, the discount rate applied to the future costs of an exchange, and the amount of time the investor expects to hold the replacement property before disposition in a fully taxable sale. We then discuss the extent to which these incremental NPVs can be used to bracket the likely effects that elimination of CRE tax-deferred exchanges would have on market values. Finally, we investigate the effects of CRE exchanges on Treasury revenue. To the extent Treasury discounts future tax revenues at a lower rate than Section 1031 investors, the cost of exchanges to Treasury is lower than the benefit to taxpayers.

The rest of this paper is structured as follows. In the next section we briefly discuss the background and mechanics of tax-deferred exchanges. In section III we develop our incremental valuation model and in section IV we use the model to estimate the magnitude of the benefits of exchanges. In section V we discuss the effect of exchanges on the present value of Treasury revenues. Section VI concludes.

II. BACKGROUND ON TAX-DEFERRED EXCHANGES

Like-kind exchanges allow deferral of income taxes on the disposition of an asset to the extent the investor uses the proceeds to acquire another similar-use asset and complies with the regulatory requirements and time limits set by the IRS. Although Section 1031 of the Internal Revenue Code (IRC), which is the basis for like-kind exchanges, dates back to the 1920s, the original rules governing exchanges were restrictive as exchanges could only be completed as a simultaneous swap of like-kind assets among two or more parties. An amendment to the original regulations was issued by the U.S. Treasury in 1984, which allowed taxpayers more time to complete an exchange, and the subsequent issuance of "safe harbor" regulations in 1991 by the Internal Revenue Service (IRS) helped promote an active like-kind exchange market. The fair market value (FMV) of like-kind properties received in exchanges by individuals, corporations, and partnership increased from approximately \$58 billion in 1998 to \$223.8 billion in 2005, as reported by the IRS (Form 8824).

Most Section 1031 CRE transactions are "delayed" exchanges that involve the use of a qualified intermediary (QI). In a delayed exchange, ownership of the "relinquished" property is transferred to the buyer. However, the buyer of the relinquished property transfers the agreed-upon sale proceeds to the QI, not the selling taxpayer. The cash paid by the buyer of the relinquished property is "parked" with the QI until the taxpayer is able to identify and acquire a

“replacement” property. The taxpayer must identify in writing the replacement property within 45 days of the sale of the relinquished property. To allow for the possibility of the taxpayer being unable to come to terms with the owner of the potential replacement property, the taxpayer may designate more than one replacement property.⁵ The taxpayer must acquire one or more of the identified replacement properties within 180 calendar days of the closing date for the relinquished property; that is, the 45 and 180 day periods run concurrently (Internal Revenue Code Section, Title 26, Section 1031). There are no exceptions to these time limits, and failure to comply converts the transaction to a fully taxable sale.⁶ At the closing of the replacement property, the QI transfers the parked cash to the seller of the replacement property, and the seller transfers ownership to the taxpayer. The transaction is potentially taxable to the extent that (1) the value of the replacement property is less than the value of the relinquished property and (2) there is cash left over with the QI after the purchase of the replacement property.

A like-kind exchange is, strictly speaking, a tax deferral technique. The taxpayer’s basis in the replacement property is set equal to the transaction price of the replacement property minus the taxable gain deferred on the disposition of the relinquished property. If the replacement property is subsequently disposed of in a fully taxable sale, the realized gain will equal the deferred taxable gain on the relinquished property, plus any additional taxable gain accrued since the acquisition of the replacement property.⁷ However, if the subsequent disposition of the replacement property is also structured as a Section 1031 exchange, the realized gain on the first property can again be deferred. If a taxable sale is avoided until the death of the taxpayer, any realized taxable gain can be permanently extinguished because the basis of property in a taxpayer’s estate is reset (“stepped up”) to current market value.

In general, both real and personal property can qualify for tax-deferred treatment. However, some types of property are specifically disqualified; for example, stocks, bonds, notes, and ownership interests in a limited partnership or multi-member limited liability company. Both the

⁵ The taxpayer may identify up to three properties of any value or may identify any number of properties so long as the combined fair market value of the properties does not exceed 200 percent of the value of relinquished property. If the first two requirements are violated, the taxpayer can salvage deferred tax treatment by acquiring, within the 180-day exchange period, 95 percent (measured by value) of the properties identified.

⁶ The time period may be less than 180 days, if the due date for filing the taxpayer’s return (including extensions) is less than 180 days from the closing date of the relinquished property.

⁷ In sharp contrast, since May 6, 1997 when the Taxpayer Relief Act of 1997 became law, if a single taxpayer has owned and lived in her home as her principal residence for at least two of the five years prior to the sale, she can permanently exclude up to \$250,000 of her capital gain from taxation. For married couples, filing jointly, the exclusion is \$500,000. This exclusion is potentially more valuable to a home owner than the potential tax deferral available to owners of income-producing property under Section 1031.

relinquished property and the replacement property must be held for productive use in a trade or business or held as a “long-term investment.” Thus, personal residences and property held for sale to consumers (i.e., “dealer” property/inventory) cannot be part of a Section 1031 exchange. A holding period greater than one year is commonly assumed to qualify the relinquished property as a long-term investment for the purposes of implementing a tax-deferred exchange; however, the one-year rule of thumb has no basis in statutory or case law. Section 1031 requires investors to redeploy the capital from relinquished U.S. property within the U.S. or its territories.

III. A MODEL OF THE COST AND BENEFITS OF 1031 EXCHANGES

Disposing of property through a 1031 exchange instead of a taxable sale has both advantages and disadvantages for a taxpayer. If a taxpayer successfully completes a simultaneous or delayed exchange, all or a portion of the realized taxable gain will be deferred until the replacement property is subsequently disposed of in a fully taxable sale. A portion of the realized gain will be recognized in the tax year in which the exchange occurs to the extent the taxpayer receives cash or other unlike-kind property (i.e., “boot”). The taxpayer will, however, receive depreciation deductions from the taxable income of the replacement property at the rate she was receiving them from the relinquished property, not the potentially higher deductions available based on the market value of the replacement property. In addition, when the replacement property is sold, if another exchange is not performed and if the property basis is not stepped up because of the taxpayer’s death, then capital gains taxes paid will be higher than if a taxable sale and purchase of replacement property had been chosen.

The present value of income tax deferral from an exchange is therefore a function of the taxpayer’s relevant marginal tax rates, the magnitude of the deferred capital gain, the expected length of time before the replacement property is disposed of in a fully taxable sale (if ever), and the applicable discount rate. All else equal, taxpayers should exchange into the replacement property if the present value of the exchange strategy exceeds the present value of the (fully-taxable) sale-purchase strategy. In this section we develop a model to estimate the incremental net present value of the exchange strategy.

A. Sale-Purchase Strategy

Assume a taxpayer who owns real property has decided the risk-return characteristics of her portfolio would be enhanced by disposing of the asset and reinvesting the equity into a replacement property located in a market with more growth potential. Assume also that a suitable replacement

property has been identified. The first strategy available to the taxpayer is to dispose of the existing property in a fully taxable sale and use the net after-tax sale proceeds, along with additional equity capital if necessary, to acquire the replacement property. The second option is to take advantage of Section 1031 of the IRC and exchange out of the existing property and into the replacement property.

The present value of the sale-purchase strategy, $PVSALE_t$, assuming all-equity financing, can be represented as:

$$PVSALE_t = (ATSP_t^1 - P_t^2) + \sum_{i=1}^n \frac{(1-\tau_{tb})NOI_i + \tau_o DEP_i^{2,s}}{(1+k)^i} + \frac{P_{t+n}^2 - SC_{t+n}^2 - \tau_{cg} CG_{t+n}^{2,s} - \tau_{dr} RECAP_{t+n}^{2,s}}{(1+k)^n} \quad (1)$$

where: $ATSP_t^1$ is the net after-tax proceeds from the fully-taxable sale of the relinquished property at time t ; P_t^2 and P_{t+n}^2 are the acquisition price of the replacement property at time t and the expected sale price of the replacement property in year $t+n$, respectively; NOI_i is the expected annual net cash flow of the replacement property in year i of the expected n -year holding period; τ_{tb} , τ_{cg} , and τ_{dr} are the taxpayer's marginal tax rate on trade or business income,⁸ capital gain income, and depreciation recapture income, respectively; $DEP_i^{2,s}$ is the allowable tax depreciation on the replacement property in year i , conditional on a sale-purchase strategy; k is the seller's required after-tax rate of return; SC_{t+n}^2 are the expected selling costs on the taxable disposition of the replacement property in year $t+n$; $CG_{t+n}^{2,s}$ is the portion of the expected capital gain on the sale of the replacement property in year $t+n$, conditional on a sale-purchase strategy in year t , that will be taxed at the capital gain tax rate. Finally, $RECAP_{t+n}^{2,s}$ is the portion of the taxable gain on the sale of the replacement property in year $t+n$, conditional on an n -year sale-purchase strategy, that represents "depreciation recapture income."

The first term on the right-hand-side of equation (1) represents the capital investment required at time t under the sale-purchase strategy, and is equal to the after-tax proceeds from a fully taxable sale minus the price of the replacement property.⁹ Note that

⁸ Equity investments in income-producing real property are classified as "trade or business" properties under IRC Section 1231.

⁹ The use of debt financing on both the relinquished and the replacement property would reduce the amount of after-tax sale proceeds from a taxable sale of the relinquished property and reduce the equity needed to acquire the replacement property.

$ATSP_t^1 = P_t^1 - SC_t^1 - TDS_t^1$, where SC_t^1 and TDS_t^1 represent sale costs and total taxes due on sale, respectively. Therefore, if the price of the replacement property (P_t^2) is equal to the price of the relinquished property (P_t^1), $ATSP_t^1 - P_t^2$ is equal to total taxes due on the sale of the existing property, plus total selling costs.

The second term on the right-hand-side of equation (1) represents the cumulative present value of the replacement property's net cash flows from annual operations, NOI_t , plus the present value of the annual tax savings generated by tax depreciation. Annual depreciation, $DEP_t^{2,s}$, under the sale-purchase strategy, is equal to

$$DEP_t^{2,s} = \frac{(1-L_t^2)P_t^2}{RECPER} \quad (2)$$

where P_t^2 is the acquisition price of the replacement property, L_t^2 is the percentage of P_t^2 that represents non-depreciable land,¹⁰ and $RECPER$ is the allowable cost recovery period in years for the replacement real property.¹¹ The tax basis of the replacement property is equal to the total acquisition price of that property, P_t^2 , not the lower basis of the relinquished property. In other words, after a taxable sale of property and the purchase of similar replacement property, an investor will have more allowable depreciation deductions over the expected n -year holding period of the replacement property.

The third and final term on the right-hand-side of equation (1) represents the expected after-tax cash proceeds from the disposition of the replacement property in a fully taxable sale at the end of the assumed n -year holding period. Deducted from the expected selling price at time $t+n$ are the following: expected selling costs (SC_{t+n}^2), the expected tax liability on the portion of the taxable gain arising from nominal appreciation in the value of the replacement property ($\tau_{cg} CG_{t+n}^{2,s}$), and the expected tax liability on the "unrecaptured" Section 1250 gain ($\tau_{dr} RECAP_{t+n}^{2,s}$). $RECAP_{t+n}^{2,s}$ is equal to the total amount of straight-line depreciation taken on the property since its acquisition.

¹⁰ We are assuming there is no personal property associated with the acquisition of the replacement property.

¹¹ Congressional legislation has repeatedly altered the period of time over which rental real estate may be depreciated (see, for example, Duca, Hendershott, and Ling, 2017). As of 2017, residential real property (e.g., apartments) may be depreciated over no less than 27.5 years. The cost recovery period for nonresidential real property (e.g., shopping centers, industrial warehouses, and office buildings) is 39 years. The calculation of the allowable annual depreciation deduction for real property in the initial and final tax year is complicated by the "mid-month convention." This convention is ignored in the discussion and calculations that follow.

Henceforth, we will refer to the portion of the total gain on sale due to appreciation in the nominal value of the property as the “capital gain” and to the portion of the gain on sale that results from the use of straight-line depreciation as “depreciation recapture income.” Under the tax code in place in 2017, capital gains are subject to a maximum federal tax rate of 23.8 percent, including the 3.8 percent Net Investment Income Tax (NIIT). In contrast, the maximum federal rate on depreciation recapture income and trade or business (ordinary) income are 28.8 percent and 43.4 percent, respectively.¹² State income tax burdens can significantly increase effective marginal tax rates.

B. Exchange Strategy

The second disposition option available to the taxpayer at time t is to take advantage of Section 1031 of the IRC and exchange into the replacement property. The present value of the exchange strategy, assuming all-equity financing, can be represented as

$$PVEX_t = P_t^1 - EC_t - P_t^2 - B_t + \sum_{i=1}^n \frac{(1-\tau_{ib})NOI_i + \tau_o DEP_i^{2,e}}{(1+k)^i} + \frac{P_{t+n}^2 - SC_{t+n}^2 - \tau_{cg} CG_{t+n}^{2,e} - \tau_{dr} RECAP_{t+n}^{2,e}}{(1+k)^n} \quad (3)$$

where P_t^1 is the selling price of the relinquished property; EC_t is the total transaction cost of exchanging out of the relinquished property into the replacement property at time t ; B_t is the additional non-like-kind property (i.e., cash or other boot) paid at time t to acquire the replacement property; $DEP_i^{2,e}$ is the annual depreciation on the replacement property in year i conditional on the use of an exchange at time t ; $CG_{t+n}^{2,e}$ is the expected capital gain income on the sale of the replacement property, conditional on an exchange strategy in year t ; and $RECAP_{t+n}^{2,e}$ is expected depreciation recapture income on the sale of the replacement property in n years assuming an exchange at time t . All other variables in equation (3) are as previously defined.¹³

If the exchanging taxpayer does not need to pay cash or other unlike-kind property to acquire the replacement property, her tax basis in the replacement property at acquisition is equal to her

¹² The maximum federal capital gain rate is the sum of the 20 percent maximum statutory capital gain tax rate plus the 3.8 percent Net Investment Income Tax (NIIT) surcharge under I.R.C. §1411 that, since January 1, 2013, applies to married households filing jointly with AGI in excess of \$250,000. From 1997 to May 6, 2003, the maximum capital gain tax rate was 20 percent. From May 6, 2003 to January 1, 2013, the maximum statutory capital gain tax rate was 15 percent. The 28.8 percent maximum rate of tax on depreciation recapture income and the 43.4 percent maximum rate on ordinary income include the 3.8 percent NIIT surcharge. When the Medicare tax, the tax benefit of the Medicare tax (for self-employed), and the impact of phasing out personal exemptions and itemized deductions are included, the marginal rate for individuals in the top 39.6 percent statutory tax bracket can exceed 43.4 percent.

¹³ For ease of exposition, this representation of the present value of the exchange strategy assumes the disposition of the relinquished property and the acquisition of the replacement property is simultaneous.

basis in the relinquished property; moreover, her annual depreciation deduction in the replacement property, $DEP_i^{2,e}$, is equal to the deduction she would have been allowed had she maintained ownership of the relinquished property.¹⁴ If property prices have increased since the acquisition of the relinquished property, this basis and depreciation carry forward is a disadvantage of exchanging into the property because an increased depreciable basis is not acquired. Similarly, if no boot is paid to acquire the replacement property, the depreciation recapture portion of the total gain on a fully taxable sale of the replacement property in year $t+n$, $RECAP_{t+n}^{2,e}$, is equal to the amount of depreciation recapture income that was deferred by the exchange, plus total tax depreciation deducted since the exchange. Although the annual depreciation deduction taken after completing the exchange ($DEP_i^{2,e}$) is lower than what would be allowed under a sale-purchase strategy (i.e., $DEP_i^{2,s}$), $RECAP_{t+n}^{2,e}$ is generally larger than $RECAP_{t+n}^{2,s}$ due to the deferred depreciation recapture income.¹⁵

C. Incremental NPV of Exchange

All else equal, the taxpayer should exchange into the replacement property if the present value of the exchange strategy exceeds the present value of the sale-purchase strategy. Subtraction of equation (1) from equation (3) produces the following expression for the incremental NPV of the exchange strategy:

$$\begin{aligned}
 INCNPV_t = & [SC_t^1 - EC_t + TDS_t^1 - B_t] - \sum_{i=1}^n \frac{\tau_{tb}(DEP_i^{2,s} - DEP_i^{2,e})}{(1+k)^i} - \frac{\tau_{dr}(RECAP_{t+n}^{2,e} - RECAP_{t+n}^{2,s})}{(1+k)^n} \\
 & - \frac{\tau_{cg}(CG_{t+n}^{2,e} - CG_{t+n}^{2,s})}{(1+k)^n}. \quad (4)
 \end{aligned}$$

¹⁴ The tax basis in the relinquished property brought forward into the replacement property is sometimes referred to as the “exchange” basis. If the replacement property has a longer recovery period than the relinquished property, the exchange basis is recovered over the remaining life of the relinquished property utilizing the depreciation method of the replacement property. If cash/boot is required to exchange into a more expensive replacement property(s), this additional boot is added to the basis and separately depreciated beginning in the tax year of the exchange over the appropriate 27.5- or 39-year cost recovery period.

¹⁵ If the holding period of the replacement property is sufficiently long relative to the holding period of the relinquished property, it is possible for $RECAP_{t+n}^{2,s} > RECAP_{t+n}^{2,e}$

The first term in equation (4) captures the immediate net benefit of tax deferral. If the time t selling costs of the sale-purchase strategy (SC_t^1) and exchange strategy (EC_t) are equal, the immediate advantage of the exchange is equal to TDS_t^1 , the deferred tax liability, minus boot paid.

The second term in equation (4) captures the cumulative present value of foregone depreciation tax savings over the n -year holding period of the replacement property. If no boot is paid to acquire the replacement property and nominal price appreciation has occurred since the acquisition of the relinquished property, then $DEP_i^{2,s} > DEP_i^{2,e}$. The depreciation recapture portion of the total gain on a fully taxable sale of the replacement property in year $t+n$ will generally be larger if an exchange was used to acquire the property. This increase in depreciation recapture income, relative to a sale-purchase strategy, decreases the incremental net present value of the exchange strategy at time t .

Finally, because the tax deferral associated with an exchange reduces the tax basis in the replacement property, the taxable capital gain due on a fully taxable sale of the replacement property will be larger with an exchange. The negative effect of the increased capital gain tax liability on the incremental NPV of an exchange is captured by the fourth term in equation (4).¹⁶

It is important to note that the immediate net benefit of tax deferral, which is often the focus of discussion concerning the tax advantage of real estate like-kind exchanges, is significantly offset by the three disadvantages of using an exchange to acquire a replacement property. The first disadvantage is that the tax basis in the replacement property is set equal to the taxpayer's basis in the relinquished property (i.e., the "exchange" basis), plus net boot paid.¹⁷ If nominal price appreciation has occurred since the acquisition of the relinquished property, the annual depreciation deduction after the exchange is less than it would be in a sale-purchase, all else equal.

The second disadvantage is that depreciation recapture income when the replacement property is disposed of in a fully taxable sale will generally be larger than with a sale-purchase strategy due to the deferred recapture income. This increased depreciation recapture tax under an

¹⁶ The annual NOI and sale price of the replacement property in year $t+n$ appear in both equation (1) and (3), but are differenced away in solving for equation (4).

¹⁷ Equivalently, the tax basis the replacement property is equal to the value of the replacement property minus the amount of the taxable gain deferred by the exchange. Note that to the extent an exchange is costlier to execute than a fully taxable sale, the additional cost of the exchange must be netted against the positive deferral benefits.

exchange, represented by the third term in equation (4), reduces the incremental benefit of an exchange.

Finally, because the deferred gain associated with an exchange reduces the tax basis in the replacement property on a dollar-for-dollar basis, the taxable capital gain due on the disposition of the replacement property in a fully taxable sale will be larger with an exchange relative to a sale-purchase strategy.

Equation (4) is used to estimate the magnitude of the incremental NPV of an exchange, $INCNPV_t$, under a number of assumptions. Estimated values of $INCNPV_t$ are then divided by (1) the price of the relinquished property and (2) the deferred tax liability to quantify the economic magnitude of exchange tax benefits.

IV. ESTIMATING THE MAGNITUDE OF EXCHANGE BENEFITS

A. Model Assumptions

Before estimating the magnitude of exchange benefits, we first calculate the deferred gain,¹⁸ which is equal to the realized gain minus any gain recognized at the time of the exchange. The realized gain or loss on the sale or exchange of the relinquished property is equal to the net sale proceeds minus the adjusted tax basis at sale. To numerically solve for the realized gain, taxes due on a fully-taxable sale, the deferred gain, and the incremental NPV of an exchange, the following base-case assumptions are employed:

- Price of relinquished and replacement properties are equal
- Mortgage debt is the same for relinquished and replacement property¹⁹
- Exchange costs are equal to selling costs of a fully taxable sale
- Relinquished and replacement properties are both non-residential real property.
- Selling cost of a fully taxable sale: 3 percent of the relinquished property's sale price
- Non-depreciable land portion of the relinquished and replacement property's original tax basis: 20 percent (no personal property)
- Trade or business (ordinary) income marginal tax rate: 39.6 percent
- Capital gain marginal tax rate: 20 percent
- Depreciation recapture marginal tax rate: 25 percent

¹⁸ Taxpayers report deferred gains from exchanges on line 24 of Form 8824.

¹⁹ The level of mortgage debt on the properties does not affect our results.

The assumed marginal tax rates on trade or business (ordinary), capital gain, and depreciation recapture income are set equal to the maximum federal statutory rates on these three sources of income. We consider below the magnitude of exchange benefits to taxpayers subject to the 3.8 percent NIIT surcharge as well as high marginal state income tax rates. The basis of non-residential real property is depreciated on a straight-line basis over 39 years. The analysis is also performed on residential income property, which is depreciated on a straight-line basis over 27.5 years.²⁰

The other key assumptions in the quantification of deferred gains and net exchange benefits are (1) the after-tax discount rate (2) the number of years since acquisition of the relinquished property ($HOLD^1$), (3) the annualized rate of nominal price appreciation since acquisition of the relinquished property (π^1), and (4) the number of years before the replacement property is expected to be disposed in a fully taxable sale ($HOLD^2$). An after-tax discount rate of six percent is initially assumed to value the incremental tax benefits of an exchange relative to a sale-purchase strategy. It is important to note that this rate is not intended to reflect the riskiness of an equity investment in CRE, including uncertainty about future rents, operating expenses, and resale prices. These operating and sale cash flows will not vary with the choice of disposition strategy because under both strategies the taxpayer is assumed to acquire the same (replacement) property. Therefore, the discount rate needs only to capture uncertainty about the relative tax savings of an exchange, which are arguably more certain than the changes in rents, operating expenses and sale prices. We examine below the sensitivity of our results to changes in the assumed discount rate.²¹

B. Deferral Benefits as a Percentage of Price

To quantify the economic significance of the incremental NPV from an exchange, we first divide the incremental NPV ($INCNPV_t$) by the dollar value of the relinquished property. Figure 1 presents our base-case results for non-residential real property. Figure 1A displays the tax savings assuming the relinquished property was acquired five years prior to the exchange. The three curves in Figure 1A capture the incremental NPV of the tax savings assuming the price of the relinquished

²⁰ An income-producing property is considered a “residential” property for income tax purposes if at least 80 percent of the gross rental income is derived from the leasing of non-transient dwelling units (hotels and motels are not residential property). The real property associated with mixed-use properties may be depreciated over a 27½-year recovery period so long as the rental income from the retail and/or office tenants does not exceed 20 percent of total rental income.

²¹ Another approach would be to compare the NPV of cash flows resulting from ownership of a property, sale of the property, purchase of another property, and ownership of that property until it is sold, both with an intermediate 1031 exchange and with a fully taxable sale. This approach would not be correct, however, because the overall risk of the two scenarios would be different, and so would require different discount rates. The state of finance theory does not make it possible to assign appropriate discount rates to the two scenarios with an acceptable level of precision.

property has increased by two, four, and six percent, respectively, since its acquisition. Figures 1B-1D present results for relinquished property holding periods of 10, 15, and 20 years. One pattern is especially noteworthy: the incremental value of an exchange is positively related to the holding period of the relinquished property. Said differently, the relative attractiveness of the exchange strategy increases with the magnitude of the accumulated gain on the relinquished property. The relation between $INCNPV_t$ and r^l for a given $HOLD^l$ is also positive; that is, increased nominal price appreciation prior to the exchange produces small increases in $INCNPV_t$.

All else equal, the value of tax deferral relative to price increases with the expected holding period of the replacement property. However, Figures 1A-1D reveal that $INCNPV_t$ increases with $HOLD^2$, but at a decreasing rate. Overall, the incremental benefit of tax deferral ranges from 0.4 percent to 7.8 percent of property value, with a mean value of 4.66 percent across the results presented in Figure 1.

It is clear from Figure 1 that the incremental value of an exchange increases with the holding period of the relinquished property and the rate of price appreciation on the relinquished property. However, the value of tax deferral never exceeds eight percent of property value even if the replacement property is assumed to be held for over 30 years before being disposed in a fully taxable sale. This is because of two directly offsetting effects. The immediate value of tax deferral increases as the holding period of the relinquished property and/or the rate of price appreciation on the relinquished property increases. However, larger deferred gains also reduce the tax basis in the replacement property relative to what it would be with a sale-purchase strategy. This, in turn, reduces allowable depreciation deductions. This loss in the present value of future depreciation substantially offsets the value of immediate tax deferral.²²

Our base-case assumptions can also be used to calculate the incremental internal rate of return (IRR) of the exchange strategy. The cash flows used to calculate the incremental IRR are the initial savings of capital gain and depreciation recapture taxes that result from a tax deferred exchange, the annual additional tax payments that result from having a lower depreciable basis in the years following the exchange, and finally the additional capital gain and depreciation recapture

²² As the holding period of the replacement property increases, the present value of the increased taxes due on sale associated with a fully taxable sale of the replacement property decreases. In contrast, the present value of the reduced depreciation tax savings associated with the exchange increases as the holding period of the replacement property increases. In fact, by year 34, the depreciation deductions on the replacement property would have been exhausted, if the relinquished property had been held for five years. This reflects the remaining 34-year cost recovery period on this nonresidential property in the year of the exchange (39-5), minus the 34 years of depreciation subsequent to the exchange.

taxes paid on sale of the replacement property that also results from the lower basis in the replacement property. Using a discount rate equal to the incremental IRR, the NPV of the initial capital gains savings is equal in absolute value to the NPV of the additional tax paid using the same discount rate.

Because the initial incremental cash flow from the exchange is positive and subsequent incremental cash flows are negative, the exchange strategy is preferred to a taxable sale if the investor's discount rate is higher than the incremental IRR.²³ These incremental IRRs range from 0.67 percent to 2.03 percent, with a mean of 1.13 percent, using our base-case assumptions.²⁴ Although discount rates for this set of cash flows might be lower than those associated with actual property net income, they are unlikely to be as low as our estimated incremental IRRs, which are comparable to U.S. Treasury rates. The U.S. government, however, with discount rates perhaps equal to Treasury bond rates, may be relatively indifferent to the investor's choice of strategy.

D. Estimates for High-Taxed States

The use of real estate like-kind exchanges varies significantly across states and metropolitan areas. California dominates other states in the use of exchanges. Colorado, Oregon, and Arizona, all states with relatively high state income tax rates, also account for a disproportionately large share of real estate like-kind exchanges.²⁵ It is in these high-tax states that the marginal, price determining, CRE investor is more likely to be contemplating the use of an exchange to dispose/acquire property. Thus, the negative effects from the elimination of exchanges are likely to be larger in these high tax states.

To estimate the differential magnitude of exchange benefits in these high tax states, we add the 3.8 percent NIIT surcharge and the 13.3 percent maximum tax rate on wage and salary income that high income California investors must pay to the maximum statutory federal rate on trade or business income of 39.6 percent. Thus, we assume a 56.7 percent tax rate on trade or business (ordinary) income. At 33 percent, California also has the highest combined state and statutory federal marginal tax rate on capital gain income in 2017. The inclusion of the 3.8 percent NIIT surcharge raises the maximum capital gain tax rate in California to 36.8 percent. We assume the

²³ In the usual case of an initial negative cash flow followed by positive cash flows, investors choose to undertake projects if their risk-adjusted discount rate is lower than the IRR. If positive initial cash flow is followed by negative cash flows, projects are chosen if investors' discount rates are higher than the IRR.

²⁴ Graphs of these incremental IRRs are contained in Figure A1 in the internet appendix.

²⁵ See Ling and Petrova (2015) for supporting evidence.

maximum rate on depreciation recapture income is 38 percent, which is five percentage points higher than the maximum capital gain tax rate.

Figure 2 presents our non-residential results for high taxed states. Figure 2A displays the tax savings for a relinquished property acquired five years prior to the exchange assuming annual price appreciation over that five years of two, four, and six percent, respectively. As in our base-case, the incremental value of an exchange is positively related to nominal price appreciation prior to the exchange. $INCNPV_t$ as a percentage of price also increases with the expected holding period of the replacement property, although at a decreasing rate. Similar patterns are visible when the holding period of the relinquished property ($HOLD^i$) increases to 10, 15, and 20 years; however, $INCNPV_t$ as a percentage of price is monotonically increasing in $HOLD^i$. Overall, the incremental present value of tax deferral ranges from 0.8 percent to 17.1 percent of property value with a mean of 9.4 percent across the parameter assumptions. This mean incremental value as a percentage of price is 469 basis points greater than the corresponding mean assuming our base-case (moderate) tax rate assumptions. Clearly the option to exchange into a replacement property is substantially more valuable to investors in high tax states, all else equal.

C. Implications of Elimination for Market Values

A change in tax law that increases the taxation of CRE investments will, in the short-run, reduce the prices investors are willing to pay per dollar of first-year (in-place) net operating income. This effect can be calculated holding all other assumptions constant; alternatively, expected general equilibrium effects of the tax law change, such as changes in the level of economy-wide interest rates, can also be included in the estimated effects. In addition, if property values in a local market fall below the cost to replace the property as a result of the negative change in tax law, some combination of reduced construction, growth in the demand for leasable space, and the steady obsolescence of the existing rental stock are required to push market rental rates up to their new equilibrium level. Only then will developers be able to recover construction costs from the sale of new properties and thereby earn a rate of return comparable to what might be earned on alternative investment of similar risk. To the extent investors anticipate these tax-induced increases in real rents in subsequent years, current market values will decline less than the amount needed to fully offset the negative tax changes. Note that if the supply of rental space in a market could instantaneously adjust to changes in tax law, current rents in a competitive rental market would always result in equality between property values and replacement construction costs.

Although general equilibrium considerations and expected long-run rent adjustments in local markets complicate a comprehensive analysis CRE tax law changes, the results reported in Figures 1 and 2 can be used to estimate the maximum short-run price declines that would be required if CRE exchanges were eliminated. If the marginal (price determining) investor in a local market does not incorporate the potential tax savings from an exchange into his bid (reservation) price for the replacement (relinquished) property, market values would clearly not be directly affected by the elimination of exchanges, although negative general equilibrium effects could depress rents and prices. In order to interpret the incremental NPV of an exchange as a percentage of price as an estimate of the effect of eliminating tax deferred exchanges on real estate prices, several assumptions are required. First, the marginal investor is taxable, profit maximizing, and is disposing of one property in order to acquire another.²⁶ Second, this investor calculates the incremental NPV of an exchange versus a fully taxable sale, and is subject to the tax rates assumed above.²⁷ Finally, no offsetting general equilibrium effects on CRE prices, either positive or negative, will be associated with elimination and the marginal investor does not anticipate a long-run response in the supply of space that would put upward pressure on real rental rates.

Under these “static” assumptions, the mean market price decline under our base case (moderate tax rate) assumptions across our price appreciation and holding period assumptions is 4.66 percent. The maximum static price decline is 7.80 percent. Under our high tax rate assumptions, the mean and maximum static price impacts are -9.35 percent and -17.1 percent, respectively. These static results bracket the high end of price declines that would occur in local markets as a result of the elimination of 1031 exchanges. It is worth noting, however, that the deferred tax from an exchange is a potential source of capital for investors buying property. If investors are capital-constrained, and so some investors are unable to purchase what would be profitable properties, then the effect on market prices could be greater than our model suggests.

²⁶ A current price exists when at least one buyer and one seller agree on a price at which to transact. These buyers and sellers are defined to be marginal investors. If the marginal investor(s) change their minds about how to value the investment, then the current investment price will change. Marginal investors are therefore considered to determine the market price of the investment.

²⁷ A less obvious assumption is that there is a substantial gap between the valuation of the marginal investor and the investor with the next highest or lowest valuation of the property. Suppose, for example, that the marginal investor is taxable and values a property at X. Assume eliminating tax deferred exchanges would reduce this investor’s valuation by Y. If a non-taxable investor happens to value the property between X and X-Y, then eliminating tax deferred exchanges will not reduce the price to X-Y, but to the non-taxable investor’s valuation which is higher than X-Y.

E. Sensitivity to the Assumed Discount Rate

From the perspective of the taxpayer, the tax deferral benefit produced by an exchange is immediate. In contrast, the foregone depreciation deductions and the increased future capital gain and depreciation recapture tax liabilities occur in subsequent years. Thus, the present value of these future exchange costs is reduced by a higher discount rate. As a result, the incremental NPV of an exchange is *increasing* in the discount rate. To examine the sensitivity of our results to lower discount rates on tax deductions and liabilities, we repeated the analysis using a four percent discount rate in place of the six percent base-case rate. For each set of assumptions, we then subtract the incremental NPV using a four percent discount rate from the corresponding six percent $INCNPV_t$, holding constant the rest of our non-residential base-case assumptions.

Although not separately displayed, the differences in incremental NPV as a percentage of price range from 0.15 percent to 3.26 percent, with a mean of 1.55 percent.²⁸ The decrease in deferral tax savings as a percentage of price associated with the use of a four percent discount rate increases at an increasing rate as $HOLD^i$ and price appreciation since the acquisition of the relinquished property increase. That is, the larger the magnitude of tax deferral the more sensitive is the incremental NPV to the assumed after-tax discount rate.

F. Residential Versus Nonresidential Real Property

Residential real estate, including large apartment complexes and small rental properties, may be depreciated on a straight-line basis over 27.5 years rather than the 39-year cost recovery period required for non-residential properties. All else equal, this more rapid depreciation increases the amount of depreciation recapture income subject to tax at sale and thereby increases the immediate benefit of tax deferral from an exchange, all else equal. However, this increased depreciation benefit is offset in part by the decreased tax depreciation associated with the carry-forward of basis and depreciation deductions into the replacement property.

We conduct the analysis for residential real property with the same set of tax rate and other assumptions used for nonresidential property. The difference (residential minus non-residential) in incremental NPV as a percentage of price ranges from -1.09 percent to +1.47 percent, with a mean of +0.10 percent, using our base-case assumptions. Thus, the increased deferral benefit associated with larger accumulated depreciation deductions on residential properties is approximately offset by the negative effects of basis carry forward and lower depreciation

²⁸ Graphs of these incremental NPV differences are contained in Figure A2 in the internet appendix.

deductions in the replacement property. As a result, our non-residential results are reasonable proxies for residential properties.

V. Effect of Like-kind Exchanges on Tax Revenue

A. Evidence from IRS Data

Individuals, corporations, and partnerships making use of a like-kind exchange in a given tax year must include a completed Form 8824 with their federal tax return.²⁹ This information is compiled and distributed by the U.S. Treasury. The top panel of Table 1 summarizes select aggregated information from Form 8824 for 2003-2012. The fair market value (FMV) of all like-kind property received by individual, corporate, and partnership taxpayers disposing of property in a like-kind exchange totaled \$116.8 billion in 2012 (Form 8824, line 17). This is up significantly from an average of \$70.0 billion during 2009 to 2011. The average FMV of like-kind property over the 2003-2012 period (unadjusted for inflation) was \$138.5 billion. These transactions generate realized gains or losses for taxpayers (Form 8824, line 19). The amount of the realized gain subject to taxation (i.e., recognized) in the year of the exchange is equal to the realized gain minus the deferred gain. The total amount of deferred gains on all like-kind exchanges (Form 8824, line 24) reported by the Treasury was \$61.6 billion in 2012 and averaged \$63.9 billion over the 2003-2012 period.

Total deferred gains reported annually by the Treasury include gains on exchanges involving vehicles and equipment used in agriculture, mining, construction, manufacturing, and other industries, in addition to real estate. The majority of like-kind exchange transactions, based on the dollar amount of deferred gains, are performed by corporations, accounting for 61 percent of the Form 8824s filed in 2007-2012. Recent information on the share of deferred gains that involved real property is obtained from Auten and Joulfaian (2014; p. 5). In 2016, just 1.6 percent of total deferred gains were reported by corporations in the real estate industry.³⁰ For partnerships, the most recent data on the distribution of like-kind exchanges across property types is from 2009. These data indicate that 76.2 percent of all deferred gains were associated with real property assets. In 2011, the most recent year for which transaction details are available for individual taxpayers, real property accounted for 80.3 percent of total deferred gains. Assuming these

²⁹ Form 8824 is available at http://www.irs.gov/pub/irs-access/f8824_accessible.pdf. Information about Form 8824 and its separate instructions can be found at www.irs.gov/form8824.

³⁰ The Treasury's allocation of deferred gains across asset types is based on the industry of the corporation. Data on asset types is not available because most corporations state "available upon request" on their capital gain forms.

percentages remained constant across the 2003-2012 period, deferred taxable gains on real estate totaled \$18.8 billion in 2012 and averaged \$28.3 billion from 2003 to 2012.³¹

The deferred gains reported on Form 8824 are only the starting point for estimating the economic benefit of CRE exchanges to investors and their cost to the U.S. Treasury. The next step is to estimate the deferred tax liabilities associated with CRE exchanges. Assuming a holding period of nine years³² for relinquished property, 2 percent annual price appreciation, and land value equal to 20 percent of total real estate value, capital gain and recaptured depreciation would both be very close to 50 percent of total taxable gain. Thus, it seems reasonable to assume that deferred real estate gains in 2012 would have been taxed at an average federal rate of 22.4 percent in a fully-taxable sale, which is the weighted average of the 20 percent maximum statutory capital gain tax rate and the 25 percent depreciation recapture income tax rate.³³ This assumption implies the total dollar amount of deferred CRE tax liabilities was \$4.2 billion in 2012 ($0.225 \times \18.8 billion) and averaged \$6.4 billion from 2003-2012.

Although significantly less than the deferred gains reported by the Treasury, on Form 8824, these deferred CRE tax liability estimates nevertheless greatly overstate the benefit of tax deferred real estate exchanges to investors and their cost to the U.S. Treasury because they do not incorporate income tax consequences subsequent to the year of the exchange. However, our analytical model of the net tax benefits of CRE exchanges includes these important future tax impacts.

B. Exchange Benefits as a Percentage of Deferred Tax Liabilities

The initial benefit to the taxpayer and the initial cost to the Treasury of an exchange, relative to a fully-taxable sale, is the dollar amount of the deferred tax liability. However, as discussed above, the value of immediate tax deferral is significantly offset by lower depreciation deductions as a result of the basis carry-forward and larger depreciation recapture and capital gain income when the replacement property is disposed in a fully taxable sale. The true economic benefit to the exchanger is therefore equal to the deferred tax liability minus the present value of reduced

³¹ For each tax year we divided the total dollar value of deferred gains reported by individuals and partnership by the total number of Form 8224s filed by individuals and partnership. The average deferred gain over 2003-2012 was \$162,655. To the extent a taxpayer reported multiple exchanges on Form 8824, the average of \$162,655 is overstated. This further supports the contention that the properties involved in tax deferred exchanges are typically modest in size.

³² A holding period of nine years is consistent with results from a survey published in the *Situs Real Estate Report* (published by the Situs Real Estate Research Corporation), 1Q 2017, Vol. 46, No. 1, page 20.

³³ Recaptured depreciation would be the property price multiplied by $8\frac{9}{39} = 0.185$ and capital gain would be the property price multiplied by $1.02^9 = 0.195$. This implies a weighted average tax rate of 22.4%.

depreciation deductions minus the present value of increased taxes due on the disposition of the replacement property in a fully taxable sale.

Figure 3 presents our base-case results for non-residential real property. Figure 3A displays $INCNPV_t$ as a percentage of the deferred tax liability assuming the relinquished property was acquired five years ago. If the replacement property is sold in a fully-taxable sale two years after being acquired in an exchange, and its nominal price has increased two percent annually over that two-year period, the NPV of tax savings is 9.7 percent of the deferred tax. Said differently, the present value of increased taxes after the exchange is equal to 90.3 percent (100%-9.7%) of the deferred tax liability. The incremental NPV as a percentage of the deferred tax liability increases (although at a decreasing rate) as the holding period of the replacement property ($HOLD^2$) increases. For replacement property holding periods greater than 25 years, $INCNPV_t$ is approximately 60 percent of the deferred tax liability.

It is important to note, however, that $INCNPV_t$ as a percentage of the deferred tax liability actually decreases as price appreciation over $HOLD^1$ increases. In addition, $INCNPV_t$ as a percentage of the deferred tax liability decreases with the rate of price appreciation over the holding period of the relinquished property. Figures 3B-3D display $INCNPV_t$ as a percentage of the deferred tax assuming $HOLD^1$ equals 10, 15, and 20 years, respectively. The incremental benefit of an exchange continues to vary little in response to changes in $HOLD^1$. However, $INCNPV_t$ continues to increase with $HOLD^2$, although at a decreasing rate.

Overall, the results displayed in Figures 3A-3D allow us to put into context the magnitude of deferred taxes associated with real estate like-kind exchanges. First, the incremental benefit of an exchange to taxpayers, as a percentage of the investor's deferred tax liability, is largely insensitive to the length of time the relinquished property has been held by the taxpayer. $INCNPV_t$ scaled by the deferred tax liability actually decreases slightly as the amount of price appreciation realized by the relinquished property increases. However, $INCNPV_t$ as a percentage of the deferred tax liability increases as the length of time the replacement property is held before a fully taxable sale increases. Clearly, the simple application of an assumed tax rate to the total amount of deferred gains reported on line 24 of Form 8824 dramatically overstates the benefits of exchanges to taxpayers and their cost to the Treasury.

As displayed in Figure 3, given the range of assumptions for $HOLD^1$; r^1 ; and $HOLD^2$, the incremental value of an exchange disposition strategy as a percent of the deferred tax liability using our base-case assumptions ranges from a low of 8.6 percent to a high of 65.5 percent,

assuming both the relinquished and replacement property are non-residential. This implies the present value of the economic benefit from real estate exchanges ranged from a low of \$100 million in 2009 and 2010 to a high of \$8.3 billion in 2005, when the CRE boom was nearing its peak (See Duca et al., 2017). The maximum incremental value of an exchange strategy, equal to 65.5 percent of the deferred tax liability, effectively assumes the property will never be disposed of in a fully taxable sale.

C. Estimated Cost to the Treasury

The present value of taxpayer benefits we calculate in our base case assumes an after-tax discount rate of 6 percent. To the extent the Treasury's opportunity cost is lower than CRE owners, the true cost of an exchange to the Treasury is lower than the corresponding benefit to the taxpayer. Taxpayer discount rates are higher than Treasury discount rates not only because the cost of capital is higher for taxpayers than for the Treasury, but also because the risks involved in choosing an exchange transaction is influenced by a taxpayer's idiosyncratic tax situation. For the Treasury, this risk is diversified over millions of taxpayers.

The benefit of immediate tax deferral to the taxpayer is equal to the tax revenue foregone by the Treasury. However, as discussed above, the immediate value of deferral to the taxpayer is partially offset by the present value of foregone depreciation deductions and the present value of larger capital gains and depreciation recapture taxes when the property is disposed in a fully taxable sale. These disadvantages to taxpayers in the years after the exchange help to offset the true cost of exchanges to the Treasury. However, to the extent taxpayer discount rates exceed the Treasury's, the cost of these increased future tax liabilities to taxpayers is less than their benefit to the Treasury. Given the Treasury's current low opportunity cost of waiting for taxpayers to recognize deferred gains in a fully taxable sale, this wedge between the net benefit of exchanges to taxpayers and the cost to the Treasury is large and potentially important to consider when formulating tax policy.

It is also important to emphasize that the use of our estimates of taxpayer benefits to approximate the cost of real estate exchanges to the Treasury assumes taxpayers would have disposed of their properties in fully-taxable sales even in the absence of the option to exchange. As estimates of foregone Treasury revenue these estimates are therefore inflated as many investors would delay disposing of their properties if a tax-deferred exchange were not available. Others

might engage in UPREIT transactions,³⁴ installment sales, or disguised sales. Ownership of real estate might also shift toward tax-exempt investors. In short, behavioral responses by taxpayers would greatly reduce the increase in Treasury revenues implied by a static analysis.

The JCT's tax expenditure estimate for like-kind exchanges in 2017 is \$90 billion over 2016-2020.³⁵ However, this estimate does not include the present value of future foregone depreciation deductions or the present value of larger capital gains and depreciation recapture taxes the taxpayer incurs as a result of choosing an exchange strategy. Moreover, this estimate does not capture likely taxpayer responses to elimination of exchanges. The JCT's revenue estimate from elimination, which does take into account behavioral responses such as delaying dispositions, is just \$9.3 billion over the five-year period, which is about one-tenth of the estimate that ignores a potential lock-in effect. If we apply the same fraction ($\$9.3 \text{ billion} \div \90 billion) to our estimated annual taxpayer benefits, the annual present value of lost tax revenue from real estate exchanges ranges from a low of \$10 million in 2009 and 2010 to a high of \$760 million in 2005. However, even these estimates are inflated because they assume the Treasury is discounting future tax revenues from an exchange at a 6 percent rate. Discounting at 2.26%, the current yield on nine-year treasury bonds, the static present value of annual lost tax revenue ranges from a low of \$4 million in 2009 and 2010 to a high of \$280 million in 2005.

VI. Conclusion

We analyze the impact of tax incentives on real estate markets and Treasury revenues by studying the economics of tax-deferred real estate exchanges. Section 1031 of the Internal Revenue Code permits taxpayers to defer the recognition of taxable gains on the disposition of business-use or investment assets. Despite widespread use, especially in states with high state income tax rates, some budget and tax reform proposals in recent years would have eliminated or curtailed this deferral option on asset dispositions.

We first develop a "micro" model that quantifies the present value of an exchange to the property owner. In addition to capturing the benefit of immediate tax deferral, the model incorporates the corresponding tax disadvantages of an exchange from the investor's perspective;

³⁴ In an Umbrella Partnership Real Estate Investment Trust (UPREIT) transaction, a seller of real estate exchanges a property for shares in a REIT, which usually owns a large portfolio of real estate. The seller can defer capital gains taxes that would have been owed in an ordinary sale.

³⁵ Joint Committee on Taxation, "Estimates of Federal Tax Expenditures for Fiscal Years 2016-2020," 2017, August 5, page 26.

in particular, reduced depreciation deductions in the replacement property and increased capital gain and depreciation recapture taxes at sale. We estimate that the incremental value of a commercial property exchange as a percentage of property value ranges from 0.4 percent to 7.8 percent, depending on the holding period of the relinquished property, the amount of price appreciation experienced by the relinquished property prior to the exchange, and the amount of time the investor expects to hold the replacement property before disposition in a fully taxable sale. This range increases to 0.8 percent to 17.1 percent in high tax states. Incremental IRRs of an exchange strategy for moderately-taxed investors ranges from 0.67 percent to 2.03 percent.

It is impossible to precisely estimate the effect of eliminating the option to exchange on property values, but under certain assumptions we estimate the maximum possible effect to be eight percent under our base case assumptions, and 17 percent in very high tax states. While perhaps not catastrophic, these would be large effects, indicating that elimination of the option to exchange could cause disruption in many CRE markets

We find little difference in the effect of eliminating tax deferred exchanges on residential compared to non-residential properties. This result is somewhat surprising given the difference in the treatment of depreciation for tax purposes between the two property types, but it is due to the offsetting advantages and disadvantages of the exchange strategy.

Using this model, we also estimate the effect of eliminating the option to exchange on Treasury tax collections. Unlike estimates that look only at the magnitude of deferred taxes to which a tax rate is applied, we take account of the disadvantages of exchanges to taxpayers, which are advantages to the Treasury. Our estimate of the gain to the Treasury if tax deferred exchanges had been eliminated in 2009, a year with relatively few exchange transactions, is \$4 million. For 2005, a year in which many exchange transactions took place, our estimate is \$280 million. An important reason that the benefit to taxpayers appears to be higher than the cost to the Treasury is the lower discount rate we apply to Treasury cash flows than to taxpayer cash flows.

Overall, elimination of tax deferred exchanges for commercial real estate is likely to reduce market values, especially in high tax states, and cause disruptions in many local real estate markets, including reduced levels of construction and financial losses. The revenue gains to the Treasury, however, would be minor.

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Figure 1: Incremental NPV of exchange as a percentage of property value

Assumptions: price of relinquished and replacement nonresidential property are equal; selling cost of a fully taxable sale and exchange costs are three percent of the relinquished property's sale price; ordinary income tax rate: 39.6 percent; depreciation recapture tax rate: 25 percent; capital gain tax rate: 20 percent; after-tax discount rate: 6 percent; non-depreciable land portion of the relinquished property's and replacement property's original tax basis: 20 percent (no personal property); The incremental NPV of the exchange, $INCNPV_t$, is calculated per equation (4); π is the amount of annual price appreciation experienced by the relinquished property since its acquisition.

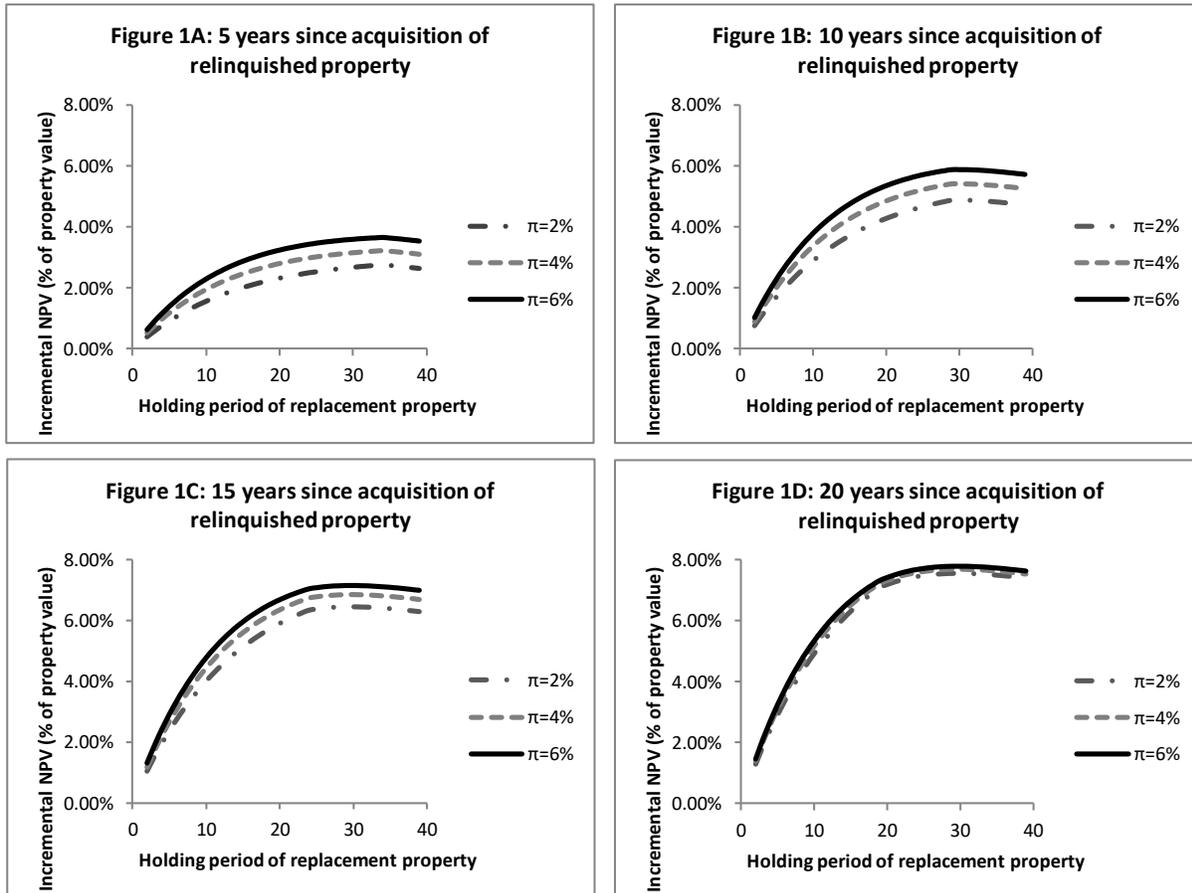


Figure 2: Incremental NPV of exchange as a percentage of property value-high tax rate assumptions

Assumptions: price of relinquished and replacement nonresidential property are equal; selling cost of a fully taxable sale and exchange costs are three percent of the relinquished property's sale price; ordinary income tax rate: 39.6 percent; depreciation recapture tax rate: 25 percent; capital gain tax rate: 20 percent; after-tax discount rate: 6 percent; non-depreciable land portion of the relinquished property's and replacement property's original tax basis: 20 percent (no personal property); The incremental NPV of the exchange, $INCNPV_t$, is calculated per equation (4); π is the amount of annual price appreciation experienced by the relinquished property since its acquisition.

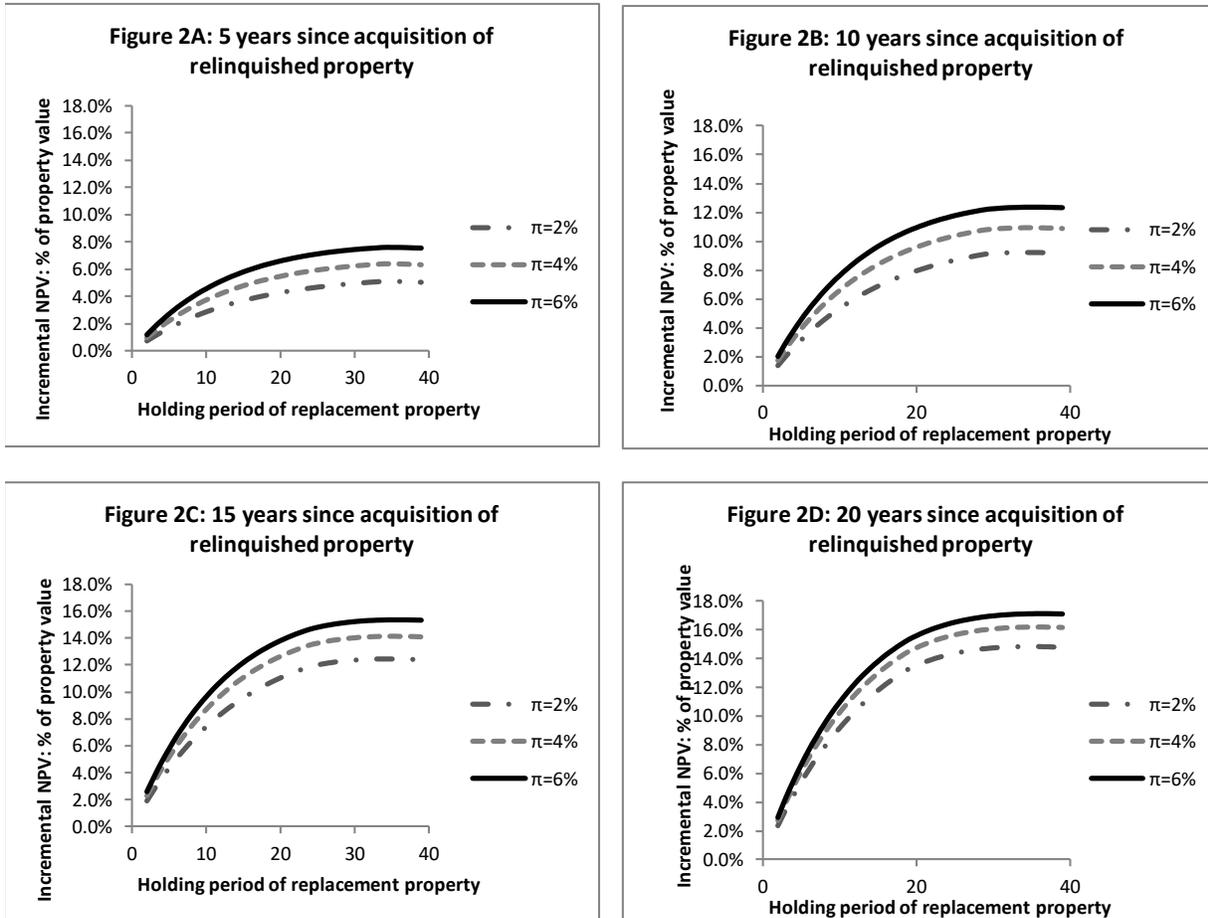


Figure 3: Incremental NPV of exchange as a percentage of deferred taxes

Assumptions: price of relinquished and replacement nonresidential property are equal; selling cost of a fully taxable sale and exchange costs are three percent of the relinquished property's sale price; ordinary income tax rate: 39.6 percent; depreciation recapture tax rate: 25 percent; capital gain tax rate: 20 percent; after-tax discount rate: 6 percent; non-depreciable land portion of the relinquished property's and replacement property's original tax basis: 20 percent (no personal property); The incremental NPV of the exchange, $INCNPV_t$, is calculated per equation (4); π is the amount of annual price appreciation experienced by the relinquished property since its acquisition.

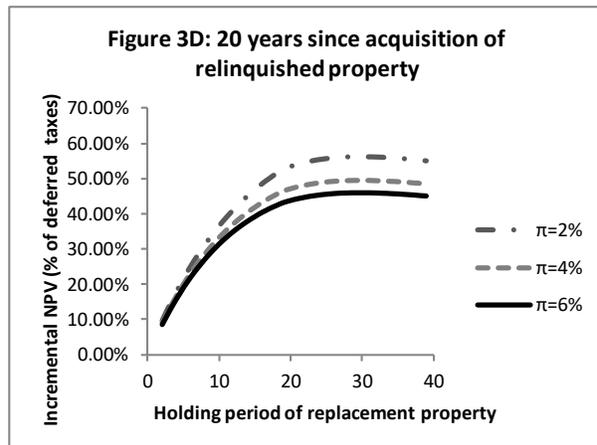
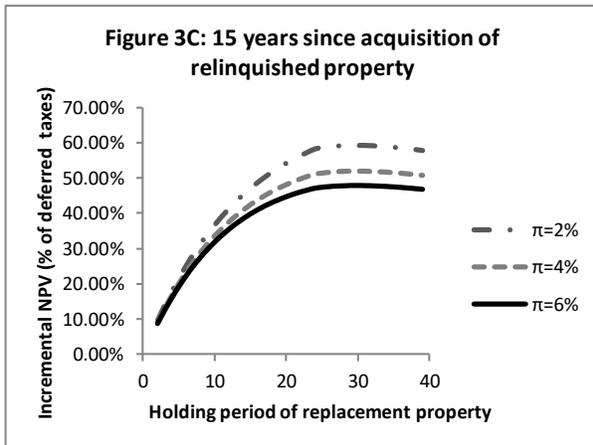
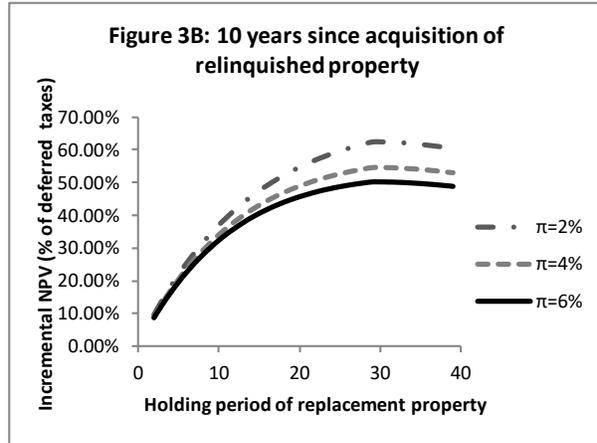
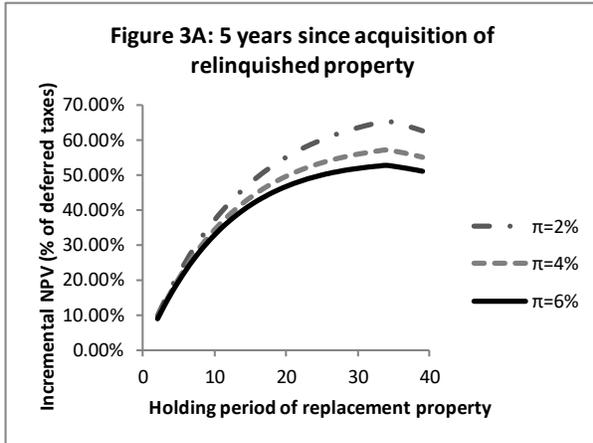


Table 1: Estimated economic benefit to taxpayers from real estate like-kind exchanges (in \$billions)

Individuals, corporations, and partnerships making use of a like-kind exchange in a given tax year must include a completed Form 8824 with their federal tax return. This information is compiled and distributed by the U.S. Treasury. The top panel of Table 1 summarizes select aggregated information from Form 8824 for 2003-2012. Total deferred gains reported annually by the Treasury include deferred gains on exchanges involving vehicles and equipment used in agriculture, mining, construction, manufacturing, and other industries, in addition to real estate. The most recent information on the share of deferred gains that involved real property is obtained from Auten and Joulfaian (2014; p. 5). To calculate deferred tax liabilities, we assume deferred real estate gains would have been taxed at an average federal rate of 22.4 percent in a fully-taxable sale, which is the weighted average of the 20 percent maximum statutory capital gain tax rate and the 25 percent depreciation recapture tax rate. The range of economic benefits to taxpayers is based on the results of our analytical model assuming both the relinquished and replacement properties are non-residential.

	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2003-2012	
Individuals + Corporations + Partnerships											Sum	Mean
FMV of all like-kind property received (Form 8824, line 17)	\$116.8	\$70.8	\$78.6	\$63.3	\$118.4	\$199.4	\$219.7	\$223.8	\$176.4	\$117.4	\$1,384.6	\$138.5
Deferred gain from all industries (Form 8824, line 24)	61.6	33.7	39.9	33.8	56.1	90.0	102.8	101.4	73.7	46.0	638.9	63.9
Deferred gain from RE industry based on most recent data	18.8	10.5	7.4	6.8	21.8	45.3	48.6	56.6	43.1	24.5	283.3	28.3
Estimated deferred tax liability from RE industry	4.2	2.4	1.7	1.5	4.9	10.2	10.9	12.7	9.7	5.5	63.7	6.4
Estimated economic benefit to taxpayers:												
Minimum-8.7% of deferred tax liability	0.4	0.2	0.1	0.1	0.4	0.9	1.0	1.1	0.8	0.5	5.5	0.6
Average-43.5% of deferred tax liability	1.8	1.0	0.7	0.7	2.1	4.4	4.8	5.5	4.2	2.4	27.7	2.8
Maximum-65.5% of deferred tax liability	2.8	1.5	1.1	1.0	3.2	6.7	7.2	8.3	6.4	3.6	41.8	4.2

Internet Appendix

Figure A1: Incremental IRR of exchange strategy

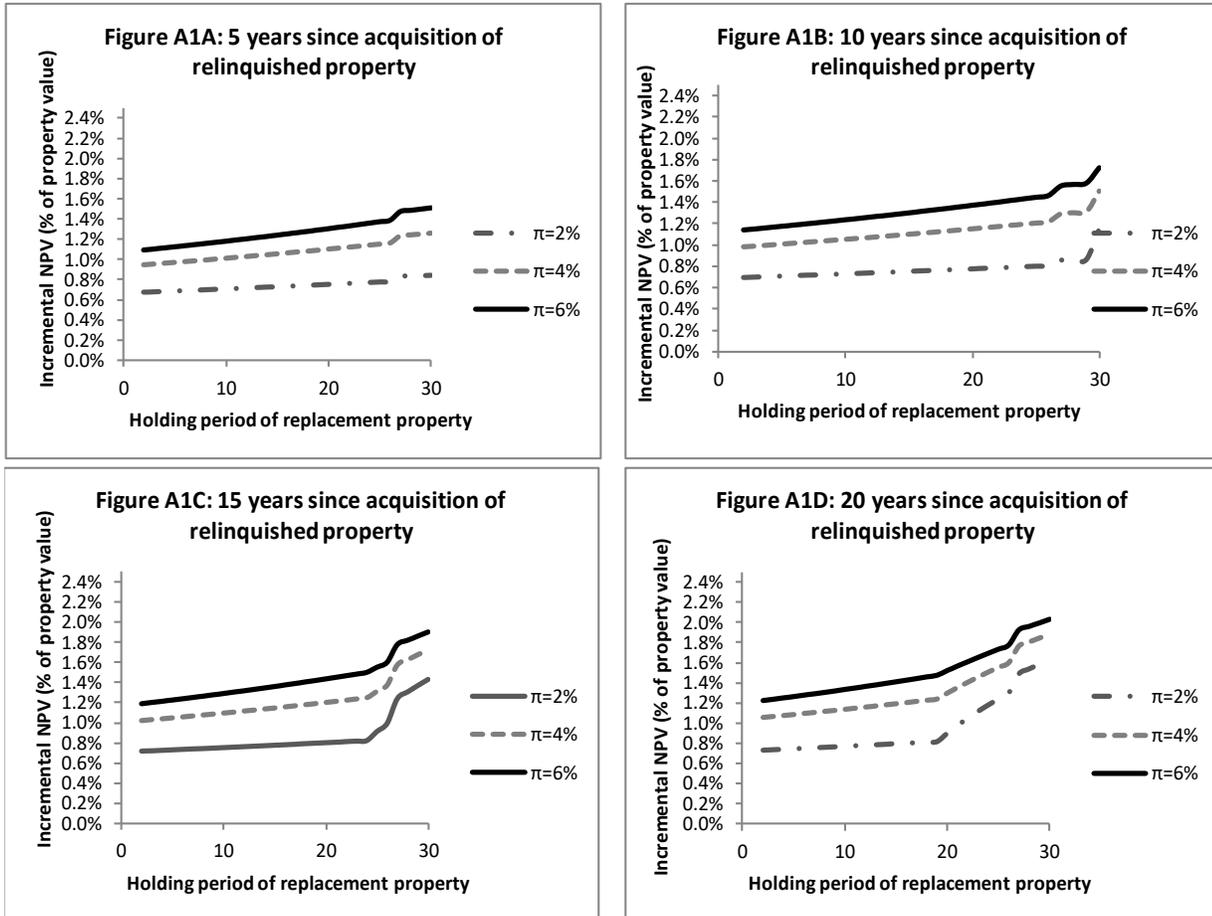


Figure A2: Difference in incremental NPV as a % of price--6% discount rate minus 4% rate

