Off-Balance-Sheet Corporate Finance with Synthetic Leases: Shortcomings and How to Avoid Them with Synthetic Debt

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Abstract

Synthetic leases provide corporations with off-balance-sheet finance for acquisition of tangible assets. The financings are less efficient for financial planning purposes than conventional on-balance-sheet debt. The inefficiencies can be avoided by replacing synthetic leases with synthetic debt. Synthetic debt finance transforms lease obligations into the investment equivalent of senior corporate debt. The distinguishing features of synthetic debt are: (1) synthetic debt represents a fixed-rate off-balance-sheet fixed-income obligation with the same default risk as on-balance-sheet debt; and (2) in default synthetic debt provides the financier with immediate recourse against the obligor comparable or superior in recovery protection to conventional senior debt.

Introduction

Occasionally a gimmick appears in corporate finance that appears to have significant shortcomings, yet that manages to develop a following among financial executives. An idea of this type currently popular with publicly traded corporations is the synthetic lease, a specialized instrument used primarily for the debt finance of corporate real estate acquisitions.1

The sole innovation provided by synthetic leases is the movement of mortgage debt off the corporate balance sheet.2 Although synthetic leases differ functionally from conventional mortgages in their effect on corporate financial accounting, they do not possess any other feature that cannot be replicated at less expense by conventional on-balance-sheet financial products.

Previous articles have examined the financial and tax accounting features of synthetic leases, mechanics of the synthetic lease structure, and other synthetic lease benefits suggested by synthetic lease vendors (e.g., Holmes, 1996; and Hodge, 1998). In addition, articles by corporate real estate professionals have discussed synthetic lease applications in corporate real estate finance (e.g., Bloomfield, 1997; and Levine, 1999). However, with the exception of Bloomfield,
the articles do not discuss the impact of the synthetic lease structure on financial risk or compare the financial risk with other real estate finance alternatives. In particular, previous articles fail to consider the economic implications of synthetic lease constraints that do not apply to conventional on-balance-sheet mortgage debt.

The recent flurry of corporate interest in synthetic leases conflicts with current academic thought on the lack of significance of off-balance-sheet debt to corporate borrowers. For example, Brealey and Myers (1996) observes that credit analysts at lending institutions view off-balance-sheet fixed-income obligations as equivalent to on-balance-sheet debt, as do investment analysts at institutional portfolio managers. This suggests that financing with off-balance-sheet debt should neither enhance corporate debt capacity nor benefit stock prices. The widely read tome concludes that off-balance-sheet debt should not have significantly greater appeal to corporate borrowers than on-balance-sheet debt.

The apparent conflict between theory and practice suggests that the accounting benefit accompanying synthetic leases may create opportunities in corporate financial management not apparent immediately from the standard academic analysis. For example, real-world corporate bond default covenants may not restrict incremental off-balance-sheet borrowing as much as incremental on-balance-sheet borrowing. Alternatively, the primary appeal of off-balance-sheet debt may represent an agency cost to the corporation.³

Agency costs frequently are probabilistic in nature. In general, the ultimate extent of the impact on corporate finances is dependent on future economic events, although the corresponding impact on stock price can be more immediate. Accordingly, it is instructive to examine incremental financial risk and constraints incurred by synthetic lease finance in return for the accounting benefit. The present study addresses these issues, highlights shortcomings and shows how to circumvent the problems they create.

### Synthetic Lease Overview

A synthetic lease is functionally a mortgage variant that provides corporations with a mechanism for off-balance-sheet fixed-income financing of 100% of the acquisition cost of corporate real estate. Application of synthetic lease technology is restricted to real estate acquisitions and build-to-suits.

Implementation of the financial technology is summarized as follows: a special purpose entity (SPE) with a thin sliver of equity capital is created to hold legal title to corporate property. A corporation leases the property from the entity, usually with renewal options.⁴ The lease is bondable net, which means that the lessee has total control of the property during the lease term and assumes responsibility for all operational and owner-related property liability arising during that term. The lease also provides the lessee with an option to purchase the property at a price equal to the combined unrecovered investment of the SPE and the mortgage financier when the lease expires.⁵ The lease specifies additionally
that, if the lessee does not exercise the purchase option when the lease expires, then the property will be sold and any appreciation in property value belongs to the lessee. In return, the lease includes a provision for the lessee to indemnify the SPE at the end of both the primary lease term and any optional renewal terms for any loss in property value, up to a maximum amount that usually equals (and in any case cannot exceed) 85% of the original property value. In other words, all upside investment risk in the property belongs to the corporate lessee, as does virtually all downside investment risk.

With property title and bondable lease including the indemnification provision in hand, the manager of the SPE mortgages the property for the duration of the primary lease term to obtain the remaining capital (i.e., capital in excess of the sliver of paid-in capital invested in the SPE) needed to purchase the property. The defining document for the SPE specifies that the SPE is not allowed to incur any additional obligations that could create other liens than the mortgage, so the indemnification provision is equivalent to a mortgage guarantee. Consequently, the interest rate on the loan is determined by the lessee’s credit rating.

Debt service for the loan during the lease term is provided by the net rent. More precisely, nearly all net rental income from the lease is passed through the SPE to the mortgage financier to provide debt service. The remaining net rent is retained by the SPE to cover operating expenses and provide an appropriate rate of return on the sliver of equity capital the SPE has invested in the property.

Exhibit 1 diagrams the ownership structure and flow of funds between lessee, SPE and financier. It is apparent from the diagram that a synthetic lease is much more restrictive than a conventional bondable net lease. It follows that acquisition by a corporate lessee of property with an existing bondable net lease cannot be financed within the synthetic lease framework without restructuring or replacing the lease.

### Cost of Capital

In order to satisfy Financial Accounting Standards Board (FASB) criteria for treating the synthetic lease SPE as the real estate owner and the synthetic lease customer as a lessee for financial accounting purposes, the SPE is required to contribute a sliver of equity capital to the real estate purchase that remains at risk for the duration of the synthetic lease term.

FASB regulations specify that the equity sliver contributed by the SPE must be at least 3% of the real estate purchase price. In practice this means 3%, neither more nor less. This implies that the SPE borrows 97% of the real estate purchase price, secured by the real estate and the indemnification agreement with the synthetic lease customer/lessee.

Synthetic lease finance differs from on-balance-sheet 100% debt finance of corporate real estate acquisitions in one theoretical respect: the corporate lessee is not responsible for reimbursement of the entire real estate acquisition cost if
the lessee declines to purchase the property when the lease expires. Instead, the synthetic lease obligates the lessee to indemnify the SPE for any shortfall in revenue when the property is sold, up to a maximum amount that equals 85% of the real estate acquisition cost less any loan amortization during the lease term. Thus, a portion of mortgage principal equal in amount to 12% (i.e., 97% minus 85%) of the property acquisition cost is secured economically by the ability of the real estate to maintain its value rather than secured legally by lessee creditworthiness. The 12% portion of the mortgage principal backed only by the real estate is unchanged in value by any loan amortization not exceeding 85% of property acquisition cost during the synthetic lease term, since the maximum amount of mortgage principal covered by the lease indemnification provision is reduced by an amount equal to the mortgage amortization.

In the case of both interest-only loans and loans that amortize a portion of mortgage principal not exceeding 85% of property acquisition cost, it follows that property value would have to decline by 88% during the primary lease term before the synthetic lease indemnification provision would be insufficient to protect the
mortgage financier’s investment. Similarly, the property value would have to decline by 85% during the primary lease term before the indemnification provision would be insufficient to protect the SPE equity sliver. In the case of loans that amortize more than 85% of the property acquisition cost, the property value would have to decline by more than 88% (resp. 85%) before the mortgage financier’s (resp. SPE’s) investment recovery would be endangered by any event other than a lessee default.

A formula for the probability of a property value decline over the primary synthetic lease term is derived in the Appendix. The formula, based on standard assumptions of investment analysis about the characteristics of investment return distributions, suggests that the risk of a property value decline of 85% or more over a term of five to seven years (the typical range of primary synthetic lease terms) is insignificant in the case of institutional-grade real estate, both in absolute terms and relative to the risk of lessee default. This is seen in Exhibit 2, which presents numerical probabilities determined by the formula for property value declines of 85% and 88% for primary synthetic lease terms between five and twenty years. For example, Exhibit 2 shows that the probability of an 85% property value decline over a term of seven years or less is estimated to be no more than 0.00012%. Thus, Exhibit 2 suggests that both the SPE equity financier and the mortgage financier are virtually certain of recovering their contributions to the real estate financing, subject to exposure to lessee credit risk.

By contrast, the risk of lessee default is not insignificant, though it is small in the case of creditworthy lessees. Synthetic lease default covenants are essentially equivalent to default covenants in senior (i.e., unsubordinated) general obligation corporate bonds. Since cross-default provisions in synthetic leases and most corporate bonds imply that a default on any obligation is a default on all such obligations, it follows that synthetic lease default risk is identical to senior general obligation debt default risk.

A comprehensive study of empirical cumulative probabilities of bond default rates over a ten-year period subsequent to issuance is presented in Altman (1989). The study is updated in Altman (1991), in which the reported empirical cumulative probability of default ranges between 1.28% and 3.85% in the case of issuer credit ratings between AA and BBB, and 13.86% in the case of BB credits. Empirically-determined loss in the event of default ranges between 26% and 71% for investment-grade credit ratings and 84% for BB credits, with ex post loss conditioned on default increasing as credit quality declines.

Although expected financier loss from lessee credit risk is small in absolute terms, for lessee credit ratings of AA and lower, the expected loss is more than two orders of magnitude greater than expected financier loss from any property value decline over the primary lease term that exceeds 85% of acquisition cost. Accordingly, there is only an insignificant difference between financier investment risk from synthetic leases with indemnification covenants that cover property declines up to 85% of property acquisition cost and financier investment risk from


Exhibit 2 | Probability of Property Value Declines During Synthetic Lease Term That Exceed SPE Equity and Mortgage Financier Loss Reimbursement Caps

<table>
<thead>
<tr>
<th>Synthetic Lease Term (Years)</th>
<th>Z-Statistic for 85% Property Value Decline</th>
<th>Probability of 85% Decline (%)</th>
<th>Z-Statistic for 88% Property Value Decline</th>
<th>Probability of 88% Decline (%)</th>
</tr>
</thead>
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<tr>
<td>5</td>
<td>−5.66</td>
<td>7.59 × 10^{-7}</td>
<td>−6.35</td>
<td>1.07 × 10^{-8}</td>
</tr>
<tr>
<td>6</td>
<td>−5.13</td>
<td>1.48 × 10^{-5}</td>
<td>−5.76</td>
<td>4.27 × 10^{-7}</td>
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<td>7</td>
<td>−4.71</td>
<td>1.25 × 10^{-4}</td>
<td>−5.29</td>
<td>6.02 × 10^{-6}</td>
</tr>
<tr>
<td>8</td>
<td>−4.37</td>
<td>6.23 × 10^{-4}</td>
<td>−4.92</td>
<td>4.41 × 10^{-5}</td>
</tr>
<tr>
<td>9</td>
<td>−4.09</td>
<td>2.19 × 10^{-3}</td>
<td>−4.60</td>
<td>2.09 × 10^{-4}</td>
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</tr>
<tr>
<td>12</td>
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<td>−3.90</td>
<td>4.81 × 10^{-3}</td>
</tr>
<tr>
<td>13</td>
<td>−3.29</td>
<td>5.00 × 10^{-2}</td>
<td>−3.72</td>
<td>9.99 × 10^{-3}</td>
</tr>
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<td>15</td>
<td>−3.01</td>
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<td>−3.41</td>
<td>3.23 × 10^{-2}</td>
</tr>
<tr>
<td>16</td>
<td>−2.89</td>
<td>1.92 × 10^{-1}</td>
<td>−3.28</td>
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<tr>
<td>17</td>
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<td>7.99 × 10^{-2}</td>
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<td>4.86 × 10^{-1}</td>
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<td>1.64 × 10^{-1}</td>
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<td>6.25 × 10^{-1}</td>
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<td>2.23 × 10^{-1}</td>
</tr>
</tbody>
</table>

Notes: Synthetic lease SPE owner losses due to property value declines that exceed 85% of property acquisition cost are not reimbursed by the lessee. Mortgage financier losses due to property value declines that exceed 88% of property acquisition cost are not reimbursed by the lessee.

corresponding synthetic leases with indemnification covenants that cover all property declines.

It follows that the lessee cost of capital in synthetic lease financings should be virtually identical to the property purchaser cost of capital in corresponding on-balance-sheet bondable mortgage and senior general obligation debt financings of 100% of property acquisition cost. The only differences for the lessee between the two forms of finance during the initial financing term are in expenses associated with establishing and maintaining the synthetic lease infrastructure and in balance sheet appearance. However, the comparison changes when refinancing risk is considered, as will be examined in subsequent sections. In addition, some uncertainty exists about synthetic lease tax accounting.
Tax Ambiguities and Implications

Virtually all synthetic leases satisfy the FASB Statement of Accounting Standards No. 13 (FASB 13) criteria for operating leases, which means that net rent is fully deductible for financial accounting purposes. If tax accounting and financial accounting were consistent, this would imply full deductibility of net rent for tax purposes as well. This is one way to interpret the tax liability of a synthetic lease.

Synthetic lease vendors do not make this interpretation. Instead, they assert that the corporate lessee in a synthetic lease should be viewed as the real estate owner for tax purposes, which implies that the SPE is viewed as a financier. This tax interpretation is a constraint on tax accounting with unfavorable implications for the lessee in general, because it means that only a portion of each net rental payment to the SPE is deductible for tax purposes: the portion that represents interest on the remaining mortgage principal and SPE capital sliver accrued since the previous payment.

This tax accounting interpretation has the dual shortcomings of fewer lessee tax deductions than the first interpretation and inconsistency with the financial accounting treatment of rent. The obvious question arises as to the advantage perceived in such an uncreative tax interpretation. The answer can be found by considering the primary tax concern of financial intermediaries: minimization of SPE tax risk.

A problem is created for the SPE by the first tax accounting interpretation. If the SPE is viewed as the real estate owner for tax accounting purposes and the synthetic lease customer as a lessee, then the entire net rent is taxable income to the SPE. On the other hand, only the interest portion of rent passed through to the mortgage financier is tax deductible. It follows that the portion of debt service that represents repayment of mortgage principal is phantom income that creates a SPE tax liability. If the SPE does not retain enough income to cover the liability, a tax bill on phantom income would shatter the cash flow equilibrium, force the SPE into bankruptcy and lead to a tax sale of the sole SPE-owned asset, terminating the mortgage financier’s investment position with murky prospects for recovery of investment capital.

With this constraint in mind, the economic rationale behind the second tax interpretation is simple: if the lessee is the real estate owner for tax purposes, then the act of forwarding rent from the SPE to the financier can be viewed plausibly (though not with absolute certainty) as the tax-neutral act of a mortgage originator servicing a mortgage.

Of course, the tax interpretation of financial intermediaries is not nearly as important to synthetic leases as the tax interpretation of the Internal Revenue Service (IRS), and here a problem exists. Although the second tax interpretation may appear the most likely to some tax attorneys, it is not the only conceivable
interpretation. In the absence of definitive case precedents, an obvious solution would be for intermediaries to seek a ruling from the IRS on the matter. However, no financial intermediary has obtained a public ruling from the IRS on the tax treatment of synthetic leases, and in particular on the tax status of the SPE. Quite possibly, no intermediary has even inquired about such a ruling for fear of generating an unfavorable result.

A potential resolution of the SPE tax ambiguity that avoids any need for an IRS ruling can be achieved by setting net rent in the lease so low that the net rent covers only accrued mortgage interest. Then no phantom income should be attributable to the SPE, since net rent does not include any debt amortization payments. This approach appears to be the resolution of choice among synthetic lease vendors.

The need to protect the SPE from any unplanned future tax liability provides the synthetic lease vendor, corporate lessee and potential mortgage financiers with a common incentive to prefer interest-only loans. However, the restriction of finance alternatives to interest-only loans represents a constraint on financial planning for the lessee.

An entrepreneurial maxim is the well-known quote: “If you have a lemon, make a lemonade.” In the synthetic lease market, this has meant portraying interest-only mortgages as a financial advantage for the lessee because it reduces cash outflow during the primary term of the lease. However, the reduction only represents a rescheduling of debt payments, not a reduction in debt cost. Accordingly, cash flow reduction during the primary lease term is achieved at the cost of increased financial risk when the mortgage comes due.

**Bullet Loans**

A successful college football coach whose teams were noted for almost exclusive reliance on running offenses was once asked why he did not let his quarterbacks throw the ball. He observed in response that three things can happen when you throw the ball, and two of them are bad. His reply applies with only slight modification to the refinance of synthetic lease debt.

Synthetic leases are recent phenomenona, and the earliest examples were implemented with significantly longer terms than current versions of the product. Consequently, it is likely that all existing synthetic leases are still in their primary lease terms. This suggests that several more years will have to elapse in order for corporate lessees to accumulate significant experience with actual synthetic lease refinancings, and several additional years before there will be experience with refinancings in a variety of financial and real estate market environments. However, results of synthetic lease refinancings can be inferred with reasonable certainty from characteristics of synthetic leases examined in previous sections.

Since synthetic lease mortgages are interest-only, there is no mortgage amortization during the synthetic lease term. It follows that mortgage principal
equals 97% of property acquisition cost when the primary lease term expires. At that time, the corporate lessee is responsible for the refinance of the entire acquisition cost, regardless of whether the lessee declines to purchase the real estate or to exercise a lease renewal option.\(^\text{18}\)

Two variables determine the impact of this event on the corporate lessee: the change in property market value during the primary lease term, and the change in lessee cost of debt during the primary lease term.\(^\text{19}\) Qualitative characteristics of the impact depend only on whether each variable decreases or increases. It follows that only four potential refinancing scenarios need be considered, and that the scenarios are characterized by whether each variable decreases or increases during the primary lease term. As we now discuss, three of the four scenarios have negative financial management implications for lessees.

To begin with, lessee rights to exercise synthetic lease renewal options are contingent on the ability of the SPE to extend its existence beyond the primary lease term by refinancing the mortgage. Since synthetically leased real estate is the sole SPE asset, SPE debt capital can only be refinanced with debt capital from another bondable mortgage if the property market value has not declined. If the property market value has declined, then only a portion of debt capital from the original mortgage can be refinanced with debt capital from another bondable mortgage. The remaining original debt capital (an amount approximately equal to the decline in property market value) must be refinanced with equity capital from investors unrelated to the lessee. The sum of new mortgage debt and any incremental equity equals the original mortgage debt, which implies that the combined book value of SPE debt and equity capital continues to equal original acquisition cost.

The synthetic lease indemnification provision continues to protect both SPE debt and equity capital. However, serial independence of investment returns implies that an incremental decline in property value during the lease option term that takes the market value down to 85% of original acquisition cost is not as unlikely as it was during the primary lease term, since the property no longer needs to lose as large a percentage of its remaining value. Accordingly, in addition to the risk premium from the lessee cost of debt, the cost of the new mortgage is likely to include an incremental risk premium not included in the cost of the original mortgage. The magnitude of the incremental risk premium will depend on the severity of the property decline during the primary lease term.

As discussed, the lessee is entitled to any increase in property value that exceeds the original acquisition cost. It follows that incremental SPE equity is a fixed-income investment, with a cost of capital that is determined by the same variables as the new mortgage debt (e.g., lease maturity, lessee credit rating and the lease indemnification provision). Due to the decline in property market value during the primary lease term, the cost of incremental SPE equity includes the incremental risk premium included in the cost of the new SPE debt.
Incremental SPE equity capital is not protected by property liquidation value, unlike the new SPE debt capital and unlike the original SPE equity capital when the property was acquired. This additional risk exposure occurs because concurrent property market value does not exceed the combined book value of new SPE debt and original SPE equity, and because the SPE equity investor claim on the property in liquidation is subordinate to the SPE debt investor claim. Accordingly, an infusion of incremental SPE equity capital is likely to require an additional incremental risk premium not included in the cost of the new SPE debt, and it is reasonable to expect the sum of the two incremental risk premia to be substantial. It follows that the lessee’s weighted cost of capital to renew the off-balance-sheet finance is likely to be noticeably higher in the event of a property market value decline than the cost of refinancing the asset with on-balance-sheet bondable mortgage or senior general obligation debt.

As a practical matter, it would be imprudent for the lessee to assume that incremental SPE equity capital will be available at reasonable cost for such a novelly secured investment in the event of a property market value decline. It is far more likely in this event that the lessee will either purchase the property from the SPE at the original acquisition cost and refinance the property with on-balance-sheet debt or direct the SPE to terminate the synthetic lease and make a lump sum payment to the SPE equal in amount to the decline in property value. If the purchase option is exercised, Generally Accepted Accounting Principles (GAAP) may require the lessee to recognize the decline in property market value on the income statement and the balance sheet. If the lessee directs the SPE to terminate the lease and liquidate the property, then it is certain that GAAP will require the lessee to recognize the decline in property market value on the income statement and balance sheet.

Irrespective of whether the lessee exercises its real estate purchase option, the probable end result in the event of a property market value decline is that the synthetic lease terminates at the end of the primary lease term. In this case, the lessee also incurs an income statement and balance sheet loss equal in amount to the decline in property market value. The recognized loss will be substantial if the property has experienced a significant decline in value.

If property market value does not decline during the primary lease term, then it is likely that the SPE will be able to refinance the mortgage near the end of the primary lease term. Accordingly, the lessee will have an opportunity to exercise its option to renew the synthetic lease, thereby extending the term of the off-balance-sheet financing.

If the lessee cost of debt increases during the primary lease term, then the new mortgage will carry a higher interest rate than the mortgage it replaces. Since the new mortgage principal equals the original mortgage principal and both mortgages are interest-only, it follows that debt service during the option term will exceed debt service during the primary lease term. Accordingly, the lessee will experience
a rent increase at the beginning of the option term to cover the SPE debt service increase. The nominal rental amount during the option term cannot be specified when the lease renewal option is negotiated, since determination of the required incremental rent depends on knowledge of the lessee cost of debt at the conclusion of the primary lease term.

Of the four refinancing scenarios, only an increase in property value without an increase in lessee cost of capital presents an opportunity to extend the off-balance-sheet financing without an increase in debt service. Thus, it is likely that refinancing will produce an unfavorable outcome.

The refinancing obstacles are exacerbated by the absence of synthetic lease amortization, as indicated. Amortization payments constitute the functional equivalent of a corporate or municipal bond sinking fund in terms of the effect on refinancing risk. The purpose of a sinking fund is to transform principal repayment from one large balloon payment into a staggered series of smaller payments, in order to reduce the risk that the borrower might fail to raise a large sum as required primarily because of inauspicious timing. Similarly, amortization reduces the risk that a relatively large refinancing attempt will occur when the real estate cycle is at a low point, the interest rate cycle is at a high point, or lessee creditworthiness is at a temporary low.

Similar scenarios and outcomes apply to refinancings of on-balance-sheet interest-only mortgages, for essentially the same reasons. Accordingly, financial professionals frequently refer to interest-only mortgages as bullet loans. However, on-balance-sheet mortgages have significant financial and accounting advantages in two of the scenarios. More precisely, in the event of a decline in property market value during the initial financing term, the property can be treated for accounting purposes as an investment asset and refinanced routinely at the lessee cost of debt with a mix of mortgage and senior general obligation debt, without income statement or balance sheet recognition of the property market value decline. By contrast, off-balance-sheet refinancing in the synthetic lease case is unlikely to be available, and even if available is likely to entail a substantially higher cost of capital than the lessee cost of debt. Accordingly, the lessee will be forced to choose between income statement and balance sheet recognition of the property market value decline and an unexpectedly costly refinancing.

The above analysis highlights two additional weaknesses of synthetic leases as a financing mechanism relative to conventional on-balance-sheet alternatives (e.g., sale-leasebacks). First, lease renewal options do not provide lessees with an unconditional right to renew the synthetic lease. Second, rent during option terms cannot be specified precisely (i.e., in nominal amounts) when the synthetic lease is created. Since rent during option terms must provide debt service for future financing with an uncertain cost of capital, rent during each option term can only be determined once the mortgage has been refinanced. It follows that renewal options in synthetic leases are significantly less useful to lessees for financial planning and control purposes than renewal options in conventional leases.
Improvements in Finance Design

The unfavorable refinancing scenarios examined can be avoided by modifying the synthetic lease structure to accommodate rent increases that amortize a significant portion of the mortgage principal. The modification should avoid the tax ambiguity that accompanies amortization in the case of conventional synthetic leases. The modification should also comply with tax code provisions under which the entire net payment can be expensed (in other words, financial accounting and tax accounting treatments of rent payments should be consistent). For financial planning purposes, lease renewal options should be exercisable unconditionally. Finally, rent during optional renewal terms should be specified in nominal amounts rather than by formulas involving parameters whose values are unknown when the lease is signed.

An economic analysis of a financing structure with the indicated characteristics is presented in Graff (1999). The structure is based on the historical concept of real estate ownership as a bundle of rights and obligations that can be split into separate ownership interests of portions of the bundle to implement a wide array of investment objectives.

As in the case of synthetic leases, the key to fixed-income finance in this structure is the primary term of a bondable net lease with a creditworthy lessee. However, in this structure there is no debt in any conventional sense, neither on-balance-sheet nor off-balance-sheet. Instead, once the financing term and the rent that will service the financing have been selected and the lease is signed, property ownership rights and obligations during the primary lease term (the term interest) are separated from property ownership rights and obligations after expiration of the primary lease term (the remainder interest). Then each bundle of rights and obligations is purchased by the appropriate participant in the leveraged real estate acquisition (e.g., financier and equity investor).

From an investment perspective, property ownership rights and obligations during the primary lease term simply represent ownership rights to the net rental stream unless the lessee defaults. Thus, with some financial engineering to fine-tune the property rights and obligations to deal with lessee default scenarios, property ownership during the primary lease term becomes a ratable fixed-income financing instrument with a credit rating determined by lessee creditworthiness. The fine-tuned bundles of property rights and obligations during and after the primary lease term are referred to as the ABBE® and LURE® interests, respectively.23

The ABBE interest is comparable for credit-rating purposes to unsubordinated lessee debt. In particular, the ABBE interest is an investment-grade fixed-income asset if the lessee has an investment-grade credit rating. It follows that purchase of the ABBE interest by a fixed-income investor provides the purchaser of the bundle of property rights and obligations after the primary lease term with an efficient source of bankruptcy-remote leverage.24
Two strategies are available to the lessee to retain total control of the property during the useful life of the property improvements and possibly beyond: lease renewal options, and investment in the LURE interest (i.e., the bundle of property ownership rights and obligations after the primary lease term has expired). Investment in the LURE interest allows the lessee to take a long-term investment position in the future economic value of the property. The lessee may purchase the entire LURE interest or a partnership interest in the LURE interest. In some applications, favorable accounting treatment requires the participation of another LURE interest investor, possibly with an equity sliver investment position analogous to the synthetic lease SPE equity sliver.

Since ABBE interest rights and obligations do not impact property ownership after the primary lease term has expired, the ABBE interest is a fully amortizing financing instrument. It follows that LURE ownership matures into debt-free ownership of the entire bundle of property rights and obligations when the primary lease term expires.

Since the property will be unleveraged and debt-free when the primary lease term expires, no constraint exists when the lease is created to prevent the specification of nominal rents during lease option terms. Thus, uncontingent lease renewal options can be designed to maximize lessee long-term financial planning opportunities, in contrast to renewal options in the case of synthetic leases.

Exhibit 3 diagrams the functional relationship and flow of funds between lessee, financier and equity investor in this investment structure. However, the diagram is not a complete legal description of the ABBE/LURE structure.

The structural fine-tuning necessary to ensure that the ABBE interest is a ratable fixed-income bond-equivalent can be implemented through the introduction of two appropriately structured SPEs to hold legal title to the bundles of property rights and obligations during the primary lease term (i.e., the term interest) and after the primary lease term (i.e., the remainder interest). Then ABBE ownership consists of beneficial ownership of the term interest SPE and LURE ownership consists of beneficial ownership of the remainder interest SPE. Accordingly, the financier becomes the beneficial owner of the term interest and the equity investor (which may include the lessee) becomes the beneficial owner of the remainder interest.

Exhibit 4 diagrams the complete ABBE/LURE investment structure. Comparison of Exhibits 3 and 4 shows that, unlike the case of the synthetic lease SPE in Exhibit 1, the ABBE and LURE interest SPEs are designed to be transparent for tax and financial accounting purposes.
foreseeable future if GWI decides to discontinue occupancy. GWI has an investment-grade rating and a current risk premium of 125 basis points over Treasuries (i.e., U. S. Treasury general obligation debt) for rated senior private placement debt with an average life of five to ten years. The Treasury yield curve is flat in the range of three to ten year maturities, with a yield to maturity of 6.00%.

Assume for the moment that GWI intends to finance the acquisition with debt (more precisely, with GWI fixed-income obligations), and that GWI would prefer to keep the debt off the GWI balance sheet if the cost of off-balance-sheet debt is competitive with other forms of debt financing. GWI would also prefer to have an option to renew the financing at least once at competitive cost. Two alternatives are available that would accomplish most of the objective: (1) a synthetic lease with GWI as lessee; and (2) a split purchase acquisition with GWI as lessee in which a financier acquires the ABBE interest and GWI or a third party acquires the LURE interest. In addition, two efficient on-balance-sheet alternatives are available: bondable mortgage debt and senior general obligation debt.

Cost of capital is not an issue in choosing between the two off-balance-sheet possibilities and the two on-balance-sheet alternatives. As already discussed, the
risk premium for all four alternatives is the same. It follows that the expected cost of capital in all four cases equals 7.25%, provided that the average life of the financing in each case is between three and ten years.\textsuperscript{25}

In the synthetic lease case, an initial financing term of five to seven years is most likely. In addition, maturities up to fifteen or more years are possible if the lessee is an attractive credit. However, commercial banks rather than insurance companies are the major financiers in the synthetic lease market.\textsuperscript{26} Accordingly, synthetic lease financings usually consist of floating rate securities.\textsuperscript{27} Since the lease provides interest-only debt service for the financing, it follows that net rent varies directly with interest rates. Unplanned rent fluctuations can make it difficult for the lessee to satisfy the cash flow constraints imposed by financial planning.
As a result, lessees are usually reluctant to commit to synthetic lease terms beyond seven years.

In the split purchase case, lease maturities up to ten years are usually feasible. In addition, maturities of fifteen or more years are feasible if the lessee is an attractive credit. The ABBE interest is an amortizing asset, which implies that the average life of the ABBE interest is less than its corresponding lease maturity. More precisely, the average life is between two and twelve years provided that the maturity is between five and nineteen years, as shown in Exhibit 5. Since amortizing debt with an average life no greater than twelve years is considered intermediate-term debt, all ABBE interests in Exhibit 5 except the final example are viewed by financiers as short-term or intermediate-term debt.

In contrast to synthetic leases, the ABBE interest is usually a fixed rate security. However, from a legal perspective, the ABBE interest is a real property equity interest that is also a wasting asset. Since the ABBE interest is an equity asset, all net rent is usually taxable income for the ABBE investor. Since the ABBE interest is a wasting asset, the ABBE investor is usually entitled to offsetting cost

### Exhibit 5 | Percentage of Property Acquisition Cost Generated by Synthetic Debt for Lease Maturities between 5 and 20 Years

<table>
<thead>
<tr>
<th>Synthetic Debt Cost of Capital (%)</th>
<th>Synthetic Debt Maturity (Years)</th>
<th>Synthetic Debt Average Life (Years, Months)</th>
<th>Estimated Property Cap Rate (%)</th>
<th>Acquisition Cost Leverage Generated by Synthetic Debt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.25</td>
<td>5</td>
<td>2 yr 7 mo</td>
<td>10.00</td>
<td>42.09</td>
</tr>
<tr>
<td>7.25</td>
<td>6</td>
<td>3 yr 2 mo</td>
<td>10.00</td>
<td>48.83</td>
</tr>
<tr>
<td>7.25</td>
<td>7</td>
<td>3 yr 9 mo</td>
<td>10.00</td>
<td>55.10</td>
</tr>
<tr>
<td>7.25</td>
<td>8</td>
<td>4 yr 4 mo</td>
<td>9.90</td>
<td>60.33</td>
</tr>
<tr>
<td>7.25</td>
<td>9</td>
<td>4 yr 11 mo</td>
<td>9.80</td>
<td>65.03</td>
</tr>
<tr>
<td>7.25</td>
<td>10</td>
<td>5 yr 6 mo</td>
<td>9.75</td>
<td>69.63</td>
</tr>
<tr>
<td>7.25</td>
<td>11</td>
<td>6 yr 2 mo</td>
<td>9.65</td>
<td>73.44</td>
</tr>
<tr>
<td>7.25</td>
<td>12</td>
<td>6 yr 9 mo</td>
<td>9.50</td>
<td>76.45</td>
</tr>
<tr>
<td>7.25</td>
<td>13</td>
<td>7 yr 5 mo</td>
<td>9.45</td>
<td>79.89</td>
</tr>
<tr>
<td>7.25</td>
<td>14</td>
<td>8 yr 1 mo</td>
<td>9.35</td>
<td>82.58</td>
</tr>
<tr>
<td>7.25</td>
<td>15</td>
<td>8 yr 9 mo</td>
<td>9.25</td>
<td>85.95</td>
</tr>
<tr>
<td>7.25</td>
<td>16</td>
<td>9 yr 5 mo</td>
<td>9.20</td>
<td>87.50</td>
</tr>
<tr>
<td>7.25</td>
<td>17</td>
<td>10 yr 1 mo</td>
<td>9.10</td>
<td>89.32</td>
</tr>
<tr>
<td>7.25</td>
<td>18</td>
<td>10 yr 10 mo</td>
<td>8.90</td>
<td>89.88</td>
</tr>
<tr>
<td>7.25</td>
<td>19</td>
<td>11 yr 6 mo</td>
<td>8.60</td>
<td>89.11</td>
</tr>
<tr>
<td>7.25</td>
<td>20</td>
<td>12 yr 3 mo</td>
<td>8.45</td>
<td>89.63</td>
</tr>
</tbody>
</table>
recovery tax deductions that amortize the ABBE interest purchase price on a straight line basis over the economic life of the ABBE interest.28

Once the lease is signed, property separation into ABBE and LURE interests can proceed without the support or participation of the lessee. Accordingly, component separation usually is invisible from the perspective of lessee tax and financial accounting.

Net rent is usually constant during the ABBE term. In the case of constant net rent, the rental capitalization (cap) rate together with the ABBE cost of capital determine the ABBE valuation as a percentage of property acquisition cost. Provided the cap rate is consistent with market cap rates, the ABBE cost of capital is independent of the cap rate level. Since larger ABBE valuations generate more leverage for the LURE investor, larger cap rates are preferable to smaller cap rates. Accordingly, in the case of ABBE finance, it is preferable to maximize the lease cap rate during the ABBE term, subject to the constraint that the cap rate be consistent with concurrent cap rates in the local spot rental market. Exhibit 5 shows estimated cap rates for annual ABBE terms between five and twenty years together with implied leverage for the LURE investor.29

It is important to note that the decline in the suggested cap rate in Exhibit 5 as a function of ABBE maturity is larger for maturities greater than seventeen years than for shorter maturities. This occurs because it is necessary to keep the leverage generated by the ABBE interest under 90% in order to ensure that the lease qualifies as an operating lease for lessee financial accounting purposes under FASB 13.30 As the examples in Exhibit 5 suggest, the 90% constraint is a greater constraint on ABBE/LURE separation in practice than the 75% constraint.

The LURE interest is a future ownership interest that does not have any ownership claims to economic benefits from the property until after expiration of the ABBE term. Consequently, accounting principles do not attribute any income to the LURE interest until after ABBE term expiration. It follows that LURE income prior to ABBE expiration does not constitute an obstacle to arbitrarily short ABBE financing terms.

As a general principle, the amount of LURE leverage generated by the ABBE interest declines as the financing term decreases. Exhibit 5 suggests that ABBE financing terms shorter than seven years generate less than 50% leverage. Accordingly, ABBE financing terms of at least seven years in length are preferable in general, with the longest feasible financing term the term of choice.

This analysis assumes debt/fixed-income financing for 100% of the property acquisition cost. If GWI purchases the LURE interest, then GWI must finance the LURE purchase price. The simplest way for GWI to finance the purchase is with on-balance-sheet debt: a bondable mortgage, senior general obligation debt or a mix of the two. It is convenient for planning purposes in the case of this property component to select interest-only debt, and a debt maturity coincident with the ABBE term expiration.
It follows that 100% financing for the acquisition consists of two components: an off-balance-sheet fully amortizing fixed rate financing for the ABBE portion of the property purchase price, and an on-balance-sheet interest-only fixed rate financing of the LURE portion of the purchase price. Both components mature when the ABBE interest expires. In addition, the components have the same cost of capital—the GWI cost of debt. Accordingly, the weighted cost of capital for the acquisition equals the lessee cost of debt.

Assume that the ABBE financing term is at least seven years in length, and that the property declines by less than 50% in value between the original acquisition date and the initial financing expiration. Since the ABBE financing term is at least seven years in length, it follows from Exhibit 5 that at least 55% of the original financing has been amortized by the end of the initial financing term. Accordingly, it is only necessary for GWI to refinance the 45% (or smaller) portion of the original financing that financed the LURE purchase.

The ABBE interest disappears at the end of the ABBE financing term and the LURE interest matures into fee simple ownership of the property. Since the decline in property value is less than 50% of original acquisition cost, it follows that property value at expiration of the ABBE term exceeds the original LURE purchase price. Accordingly, GWI can refinance the property with an on-balance-sheet fixed rate bondable mortgage at the GWI cost of debt for an amount that exceeds the original LURE financing.

By employing a slightly more complicated variant of the ABBE/LURE structure, it is possible to keep most of the property financing off the GWI balance sheet for at least one additional financing term. If a third party acquires the LURE interest, then GWI can achieve the same functional result with lease renewal options.

Finally, if GWI is debt-free with abundant liquid capital, it can finance property acquisitions within the ABBE/LURE framework by allowing bondable GWI leases to be incorporated into ABBE interests that are marketed to fixed-income investors and purchasing the corresponding LURE interests without external financing. This has the incidental benefit of allowing the marketplace to determine the GWI cost of debt empirically by pricing the ABBE interests while GWI remains totally debt-free.

The idea of a debt-free company with empirically determined cost of debt suggests that ABBE finance creates a kind of synthetic debt (i.e., an obligation that financiers view as equivalent to senior corporate debt for investment purposes but that does not qualify as debt for tax or financial accounting purposes). This suggests in turn that ABBE finance performs essentially the reverse function of synthetic lease finance. Whereas synthetic lease finance transforms debt into synthetic leases, ABBE finance transforms leases into synthetic debt. Accordingly, ABBE securities can be viewed for investment purposes as synthetic corporate bonds.
The distinguishing features of synthetic debt are: (1) synthetic debt represents a fixed-rate off-balance-sheet fixed-income obligation with the same default risk as on-balance-sheet debt; and (2) in default synthetic debt provides the financier with immediate recourse against the obligor at least comparable in loss risk to conventional senior debt.

Conclusion

Synthetic leases were developed to enable off-balance-sheet debt finance of corporate real estate acquisitions. Synthetic leases typically finance 100% of property acquisition cost.

Shortcomings exist in synthetic lease financings because the rental payments that service the debt cannot be large enough to provide principal amortization and still be deductible financings by the lessees for both tax accounting and financial accounting purposes.

Because of uncertainty about whether synthetic lease SPEs could be liable for income tax on amortization payments, mortgage financiers, corporate lessees and financial intermediaries all have incentive to prefer interest-only loans. Consequently, synthetic leases are invariably interest-only financings. Accordingly, amortization is absent from synthetic lease finance.

The refinancing obstacles are exacerbated by the absence of synthetic lease amortization, as indicated. Amortization payments constitute the functional equivalent of a corporate or municipal bond sinking fund in terms of the effect on refinancing risk. The purpose of a sinking fund is to transform principal repayment from one large balloon payment into a staggered series of smaller payments, in order to reduce the risk that the borrower might fail to raise a large sum as required primarily because of inauspicious timing. Similarly, amortization reduces the risk that a relatively large refinancing attempt will occur when the real estate cycle is at a low point, the interest rate cycle is at a high point, or lessee creditworthiness is at a temporary low.

In the case of interest-only synthetic leases, an adverse outcome is likely when the loan principal is due: an unplanned balloon cash payment that is recognized on the lessee income statement and balance sheet, an unplanned increase in debt service or both. In addition, synthetic lease financings usually consist of floating rate debt rather than fixed rate debt. It follows that synthetic lease finance is inconsistent with efficient long-term financial planning.

Synthetic lease shortcomings can be circumvented with a financial structure based on the concept that real estate ownership is a bundle of rights and obligations that can be split into separate ownership interests of portions of the bundle to implement a wide variety of investment objectives. More precisely, property ownership is separated into a term ownership interest (the bundle of property
ownership rights and obligations during the primary lease term) and a remainder ownership interest (the bundle of property ownership rights and obligations after the primary lease term has expired).

With additional financial engineering (transparent for financial and tax accounting purposes), beneficial ownership of the term interest becomes an amortizing fixed-income asset with a credit rating determined by the lessee cost of debt. The beneficial interest can be sold to fixed-income investors to provide leverage for acquisition of beneficial ownership of the remainder interest by real estate equity investors. Beneficial ownership of the term interest is referred to as the ABBE interest, and beneficial ownership of the remainder interest is referred to as the LURE interest.

Unlike synthetic leases, the ABBE interest financing instrument is fully amortizing. If necessary, additional investment-grade financing can be created by further dividing the LURE interest into appropriately structured preferred and residual interests. With supplementary fine-tuning, the preferred interest becomes an additional investment-grade fixed-income asset that can be used to generate more leverage for equity investors.

The separation of bundles of property rights and obligations into distinct ownership interests is a fixture of estate planning that predates the Constitution. In particular, term/remainder separation is a long-established concept in Anglo-Saxon property law. The financial fine-tuning that creates the ABBE/LURE structure and enables the structure to be applied to corporate finance is a recent innovation (cf., Graff, 1999).

In contrast to synthetic leases, leases in the ABBE/LURE structure can be conventional bondable net (and in some cases triple-net) leases. Furthermore, the ABBE/LURE structure can be used to finance real estate acquisitions in which preexisting bondable net leases are still in effect. Accordingly, some real estate acquisitions can be financed by ABBE/LURE separation without active lessee support or participation in the transactions.

Again in contrast to synthetic leases, unconditionally exercisable lease renewal options that specify option term rents in nominal amounts do not constitute an obstacle to implementation of the ABBE/LURE structure. Thus, unlike renewal options in synthetic lease finance, lease renewal options in ABBE/LURE finance can be useful tools for corporate lessees in long-term financial planning.

ABBE finance is the diametric opposite of synthetic lease finance, but without the ambiguities that accompany synthetic leases. Synthetic lease finance transforms debt into leases for accounting purposes. By contrast, ABBE finance transforms leases into synthetic debt for investment purposes. Accordingly, ABBE securities can be viewed as synthetic corporate bonds by fixed-income investors.

In contrast to conventional debt, synthetic debt is an off-balance-sheet fixed-income obligation. In contrast to synthetic leases, in default synthetic debt
provides the financier with immediate recourse against the debtor comparable in loss risk to conventional senior debt.

The lease-to-debt transformation is more certain from accounting and legal perspectives than the reverse direction. Consequently, ABBE finance is unlikely to confront the marketing constraints that force synthetic leases into such artifices as floating interest rates in order to appeal to a restricted class of financiers. It follows that, unlike synthetic lease finance, ABBE finance is unlikely to remain confined to the status of a niche product.

Technological development of ABBE finance is complete, and it has resulted in financial products with unique and desirable characteristics from the corporate finance perspective. It remains to be seen how fast these products will attract the attention of the corporate finance community.

Appendix

A formula that determines the probability of a property value decline of any specified amount over the term of a synthetic lease is derived here under standard assumptions of investment analysis. The probability is shown to be determined by the term of the lease together with the expected annual capital gain component of investment return from the property and the standard deviation of annual capital gain.

The derivation is based on the assumption that the capital gain component of real estate investment return is lognormally distributed. More precisely, for each sample period \( m \), assume that

\[
\ln(1 + r_{c,m}) = \ln(1 + (\nu_m - \nu_{m-1})/\nu_{m-1}) = \ln(\nu_m/\nu_{m-1}) = \ln(\nu_m) - \ln(\nu_{m-1})
\]

has a normal distribution, where \( r_{c,m} \) is the capital gain component of investment return in period \( m \), and \( \nu_m \) (resp. \( \nu_{m-1} \)) is the property value at the end (resp. beginning) of period \( m \). Then, letting \( V \) denote \( \ln(\nu) \), \( \Delta V_L \) denote the difference between the natural logarithm of the property value at the end of the primary lease term and the corresponding natural logarithm of initial property value, \( \tilde{\mu}_L \) denote the expected value of \( \Delta V_L \) and \( \tilde{\sigma}_L \) denote the standard deviation of \( \Delta V_L \), it follows that \( (\tilde{\mu}_L + \ln(1 - k/100))/\tilde{\sigma}_L \) is the \( z \)-Statistic for a \( k\% \) decline in property value during the primary lease term. In other words, the probability of a \( k\% \) property value decline during the primary lease term equals \( N(\tilde{\mu}_L + \ln(1 - k/100))/\tilde{\sigma}_L \), where \( N( ) \) denotes the cumulative probability of the normal distribution. Thus, in order to compute the probability of an 85\% property value decline across the primary lease term, it suffices to determine the numerical values of \( \tilde{\mu}_L \) and \( \tilde{\sigma}_L \).

Assume in addition that the capital gain component of investment return is serially independent and identically distributed (i.i.d.), and let \( n \) denote the number of years in the primary lease term. In order to simplify the discussion, assume that the primary lease term consists of an integral number of years. Then \( \Delta V_L = \ln(\nu_n/\nu_0) = \ln(\nu_n/\nu_{n-1}) + \ldots + \ln(\nu_1/\nu_0) \). It follows that \( \tilde{\mu}_L = n\tilde{\mu} \) and \( \tilde{\sigma}_L = n^{1/2}\tilde{\sigma} \), where \( n \) denotes the length of the primary lease term in years,
\( \tilde{\mu} = \mu(\Delta V_m) = \mu(V_m - V_{m-1}) \) denotes the expected value of the annual logarithmic capital gain and \( \tilde{\sigma} = \sigma(\Delta V_m) = \sigma(V_m - V_{m-1}), \ m = 1, \ldots, n, \) denotes the standard deviation of the annual logarithmic capital gain. Thus, the probability of a \( k\% \) property value decline across the primary lease term, which will be denoted by \( p(-k\%) \), is given by the following equation:

\[
p(-k\%) = N((n\tilde{\mu} + \ln(1 - k/100))/(n\tilde{\sigma})). \tag{1}
\]

Accordingly, in order to determine \( p(-k\%) \), it suffices to determine the numerical values of \( \tilde{\mu} \) and \( \tilde{\sigma} \).

Let \( \mu_c \) denote the expected value of \( r_c \) and \( \sigma_c \) denote the standard deviation of \( r_c \), where \( r_c \) is the capital gain component of total annual property return. Then standard statistical analysis expresses \( \mu_c \) and \( \sigma_c \) in terms of \( \tilde{\mu} \) and \( \tilde{\sigma} \). It is straightforward to invert the relationship and show that:

\[
\tilde{\sigma} = (\ln(1 + (\sigma_c/(1 + \mu_c))^2))^{1/2}, \tag{2}
\]
\[
\tilde{\mu} = \ln(1 + \mu_c) - 1/2\ln(1 + (\sigma_c/(1 + \mu_c))^2). \tag{3}
\]

These equations determine the numerical values of \( \tilde{\mu} \) and \( \tilde{\sigma} \) in terms of the expected value and standard deviation of the capital gain component of annual property return. Thus, it only remains to determine numerical values for \( \mu_c \) and \( \sigma_c \).

An approach based on institutional management expectations can be used to estimate the expected annual capital gain. In the case of institutional-grade property, expected annual return is usually between 11% and 12% when property is acquired, with expected returns in recent years tending toward the lower value. Of this amount, approximately 8.50% is assumed to be income and 2.50% is expected capital gain. These expectations are consistent with observed income and capital gain aggregates in the NCREIF database. Since synthetically leased property is usually institutional-grade, it is assumed for purposes of this analysis that \( \mu_c = 2.50\% \).

An empirically based approach is more suitable for estimating the standard deviation of annual capital gain. Graff (1998) reports the sample mean for a distribution of several hundred sample standard deviations of annual appraisal-based return series of eight to eleven years duration for individual National Council of Real Estate Investment Fiduciaries (NCREIF) properties to be 13.60%. This value is derived from the largest data set of disaggregated annual return series for institutional-grade properties currently available, and is the
estimate used in this analysis for the standard deviation of the annual property return distribution.

In the case of triple net leases, tenants pay all property-related expenses. It follows that net nominal income from a triple net lease does not vary unless the lease contains scheduled increases in the net rent. Although synthetic leases usually allow the possibility of changes in net rent during the lease term in response to unplanned changes in interest rates, the scheduled variation in net nominal income is zero. Accordingly, in order to simplify this analysis, it is assumed that the expected variation in net nominal income is zero.35

Net income from a constant rent net lease is not necessarily constant in relative terms, since relative income is the ratio of nominal net rent to nominal property value, and nominal property value varies with time. Let $I$ denote the (constant) nominal income, and let $i_m = I/n_{m-1}$ denote the income component of total return during year $m$, expressed as a percentage of value at the beginning of the year. Denoting the change in the income component between years $m$ and $m + 1$ by $\Delta i_m$ and the corresponding capital gain component by $\Delta c_m$, it follows that:

$$\Delta i_m = I/n_m - I/n_{m-1} = (I)(1/n_m - 1/n_{m-1})$$
$$= (I)((n_{m-1} - n_m)/(n_m n_{m-1}))$$
$$= (I/n_m)((n_{m-1} - n_m)/n_{m-1})) = -i_{m+1} \Delta c_m. \tag{4}$$

Thus, each annual change in the income component is opposite in sign to the corresponding annual capital gain component but of much smaller magnitude, since average expected annual income equals 8.5%. Since annual income change is relatively small, it can be viewed as an approximately constant percentage of the capital gain component in the estimation of $\sigma_c$. Letting $\rho$ denote the correlation between $i$ and $r$, it follows from Equation (4) that $\rho = -1$. Accordingly, the algebraic formula for the summation of variances implies that $\sigma_i^2 = \sigma_c^2 + \sigma_i^2 + 2\rho \sigma_i \sigma_c = \sigma_c^2 + \sigma_i^2 - 2\sigma_i \sigma_c = (\sigma_c - \sigma_i)^2$, which implies that $\sigma_i = \sigma_c - \sigma_i$, where $\sigma_i$ and $\sigma_c$ denote the standard deviations of annual property return and annual property income, respectively. It follows that $\sigma_i = .085\sigma_c$, which implies that $\sigma_i = \sigma_c - .085\sigma_c = .915\sigma_c$. Consequently, $\sigma_c = \sigma_c / .915 = 13.60\% / .915 = 14.86\%$, and $\sigma_i = .085\sigma_c = .085(14.86\%) = 1.26\%$. Equations (2–3) imply immediately that $\tilde{\mu} = 1.43\%$ and $\tilde{\sigma} = 14.43\%$. Substituting these values into Equation (1) with $k = -.85$ shows that the probability of an 85% property value decline at the end of the primary lease term is $N((.0143n - 1.897)/(.1443n^{.5}))$, where $n$ is the number of years in the primary lease term. It is straightforward to verify that the probability is an increasing function of the length of the lease term, as is suggested by columns 3 and 5 of Exhibit 2.36
The clearly dominant factor in the $z$-Statistic of an 85% property value decline is $\ln(0.15) = -1.897$, regardless of the choice of $n \leq 20$. The magnitude of the factor $\ln(0.15)$ relative to the other factors in the formula for the $z$-Statistic suggests how unlikely it is for a low-volatility asset with a lognormal value distribution to lose 85% of its value in as short a period as ten years. Accordingly, it is not surprising that the probability of an 85% property value decline is no more than .006% for every $n \leq 10$, as shown in Exhibit 2.

### Endnotes

1 Synthetic leases also can be used by corporations for off-balance-sheet finance of certain types of equipment purchases (e.g., airplanes).

2 Real estate debt held off-balance-sheet by the synthetic lease structure is not invisible to credit and security analysts. For example, in the case of publicly traded corporations, the debt appears in footnotes of corporate annual reports and 10-K reports filed with the Securities and Exchange Commission.

3 For example, improvement of balance sheet financial ratios with off-balance-sheet debt could cosmetically enhance short-term corporate performance as perceived by corporate board members, many of whom do not have financial backgrounds. This could lead to several years of higher bonuses for senior corporate officers.

4 Unlike renewal options in conventional leases, synthetic lease renewal options do not convey an unfettered right to extend the lease term. Lessees can only exercise renewal options under future economic scenarios specified in the options. This constraint and its financial implications are discussed below.

5 The option purchase price is equal to the real estate acquisition cost less any mortgage amortization during the primary lease term.

6 The 85% maximum in the indemnification provision must be adjusted downward by any amortization during the lease term of debt financing used to fund the real estate acquisition, e.g., see Hodge (1998) and Holmes (1996).

7 Current guidelines for treating the synthetic lease SPE as the property owner were defined by the FASB Emerging Issues Task Force (EITF) in EITF 90-15 (e.g., see Holmes, 1996; and Hodge, 1998).

8 Standard investment analysis assumes that investment returns are normally or lognormally distributed, and that returns are also serially independent and identically distributed.

9 Analytical assumptions about probability distributions in the risk model imply constraints on the economic characteristics of property to which this analysis applies. For example, the synthetic lease rent should be a competitive market rent at the time mortgage financing is secured. In addition, acquisition cost should be a realistic estimate of concurrent property resale value in the absence of lessee participation in the local real estate market. Accordingly, the analysis does not apply to special purpose build-to-suits or to build-to-suits in markets in which the lessee constitutes the dominant source of demand.

10 Recent experience in the financial markets such as the Long-Term Capital Management debacle suggests that extreme events occur with greater frequency than suggested by models based on homoscedastic normal and lognormal probability distributions (e.g.,
Consistent with these observations, Young and Graff (1995) and Graff, Harrington and Young (1997) present empirical evidence suggesting that stable fat-tailed distributions constitute the appropriate models for logarithms of commercial real estate investment returns and also that real estate investment risk is heteroscedastic. In addition, Young and Graff (1996) and Graff, Harrington and Young (1999) present empirical evidence suggesting that extreme returns (but not moderate returns) are serially persistent. Each empirical result suggests that conventional risk models underestimate the probability of extreme events such as an 85% decline in property value. However, financial industry analysts currently model investment risk with homoscedastic normal and lognormal distributions. It follows that the numerical probabilities presented in Exhibit 2 are consistent with state-of-the-art financial industry risk analysis.

Expected recovery rates in event of default may differ slightly in the case of synthetic leases, but synthetic leases are still too new for data to be available that might allow empirical determination of whether any differences exist, or to estimate their magnitudes if they do exist. In any case, any expected differences in default recovery between bonds and synthetic leases would have at most a secondary effect on the cost of capital in synthetic lease finance. A primary cost determinant would continue to be lessee credit rating.

FASB 13 restricts the operating lease designation to leases that meet four criteria: the present value of minimum rental payments during the primary lease term (including any terminal payments for nonrenewal) must be less than 90% of property market value when the lease is signed, the primary lease term must be less than 75% of remaining useful property life when the lease is signed, the lease cannot transfer property ownership to the lessee during the primary lease term, and the lease cannot contain an option to purchase the property at a bargain price (e.g., Holmes, 1996; and Hodge, 1998).

If viewed as the property owner for tax purposes, then the lessee receives a depreciation deduction as partial compensation for the inability to deduct the entire rent payment for both tax and financial accounting purposes. The compensation is total if loan amortization does not exceed the portion of depreciation available during the primary lease term, and more than total if the loan is interest-only. However, absence of loan amortization negatively impacts both the financial accounting and the financial planning features of synthetic leases.

This is a plausible interpretation. However, in the absence of case precedents and an IRS ruling, it does not guarantee that the SPE is free from unplanned tax exposure (e.g., see Hodge, 1998).

The quote is widely credited to Dale Carnegie, see Carnegie (1948).

The University of Texas (UT) and Ohio State University (OSU) athletic departments both attribute this remark to a famous coaching alumnus: Darrell Royal in the case of UT, and the late Woodrow (Woody) Hayes in the case of OSU. The remark is consistent with the coaching philosophies of both individuals, each of whom was recognized in the early stage of his career for consistently successful teams built around overpowering defense and mistake-free conservative offense. Both men were also renowned for their pithy aphorisms. Writers at Sports Illustrated attribute the remark to Darrell Royal, but do not cite a source.

If the lessee does not purchase the property or renew the lease, then refinancing takes the form of a property sale together with payment by the lessee of a lump sum rental.
cancellation penalty to the SPE to make up any shortfall in the sale price relative to the original acquisition cost. The cancellation penalty goes on the lessee’s income statement and flows through to the balance sheet.

19 Change in lessee cost of debt is a function of changes in three basic variables: interest rate levels (e.g., the U. S. Treasury bond yield curve), corporate bond risk premia (e.g., as a function of credit rating) and lessee creditworthiness (e.g., as reflected by the lessee credit rating).

20 If the decline in property value during the primary lease term is no more than 3%, this complication can be circumvented by subordinating the property liquidation claim that secures the original SPE equity investment to the liquidation claim that secures the incremental SPE equity. Such subordination increases the investment risk of the original SPE equity without any compensating benefit, so the likelihood that an investor in original SPE equity would agree to such an arrangement probably depends on whether other business connections exist between the investor and the lessee. However, if the property value decline exceeds 3%, then the property liquidation value can protect at most a fraction of incremental SPE equity book value, where the numerical value of the fraction varies inversely with the severity of property value decline during the primary lease term.

21 As already discussed, the payment is capped at a maximum amount equal to 85% of acquisition cost, although this maximum is more than large enough to cover 100% of all realistic declines in real estate market value.

22 The prevalence of bullet loan financings contributed to the savings-and-loan commercial real estate lending debacle in the mid-1980s, and to the collapse of both the residential and commercial real estate markets at the end of the 1920s.

23 ABBE and LURE are registered trademarks of Graff/Ross Holdings. ABBE and LURE interests are proprietary products of Graff/Ross Holdings and Electrum Partners LLC. The author is a founding principal of both Graff/Ross Holdings and Electrum Partners, and holds investment interests in both entities.

24 The leverage is bankruptcy-remote because the owner of the LURE interest (i.e., the bundle of property rights and obligations after expiration of the primary lease term) has no claim on any portion of the bundle of property rights and obligations that comprise the ABBE interest. Accordingly, the owner of the ABBE interest has no need for concern about the identity or financial status of the LURE interest owner. Similarly, the ABBE interest owner has no claim on any portion of the bundle of rights and obligations that comprise the LURE interest. It follows that the LURE interest owner need have no concern about the identity or financial status of the ABBE interest owner.

25 In order to simplify the analysis, the cost of capital comparison does not include expenses associated with establishing and maintaining any operational infrastructure required by the financing. Such expenses are greater for off-balance-sheet finance than for on-balance-sheet finance, and currently are greater in the case of ABBE finance than in the case of synthetic leases. Expenses associated with ABBE finance can be expected to be comparable to the synthetic lease case when ABBE finance is a seasoned product and the market for ABBE finance becomes more developed.

26 Apparently insurance industry regulators are not completely confident about the rectitude of standard investment risk analyses that suggest negligibly small values for the probability of property value declines in excess of the maximum covered by synthetic lease reimbursement covenants (see Endnotes 9 and 10).
In order to avoid insolvency, commercial banks attempt to maintain parity between changes in asset and liability valuations. Unlike insurance companies, banks have predominantly short-term liabilities with valuations that do not fluctuate much in response to interest rate changes. Since valuations of floating rate securities are less affected by interest rate changes than fixed-rate bonds, banks are more attracted by floating rate fixed-income investments than insurance companies. Accordingly, banks rather than insurance companies are the major synthetic lease financiers.

Investment cost recovery in the form of property depreciation usually does not exist under this structure, since the real estate is separated into two legally and functionally unrelated equity assets. In place of property depreciation, ABBE and LURE investors usually are entitled to independent cost recovery of their respective acquisition costs: amortization in the case of the ABBE interest and depreciation in the case of the LURE interest. Cost recovery is not available for the LURE investor until the LURE interest begins generating income, which usually does not occur until after completion of the primary lease term.

Rent is assumed to be paid monthly and due at the beginning of the month. In order to simplify the analysis, the figures do not include expenses associated with establishing and maintaining the off-balance-sheet infrastructure (see Endnote 25).

As with synthetic leases, resolution of tax and accounting questions regarding term/remainder separation requires more information about real estate acquisitions than that considered here. Accordingly, professional opinions from qualified financial accountants and tax counsel are essential to implementation of either financial structure.

A real-valued random variable $x$ is defined to be lognormal if $\ln(x)$ has a normal probability distribution, where $\ln(x)$ is the natural logarithm of $x$. Lognormally distributed variables have the advantage for financial modeling purposes (e.g., over normally distributed variables) that they are always positively valued. For example, lognormally distributed variables are the variables of choice in option pricing theory (e.g., Jarrow and Rudd, 1983; and Cox and Rubinstein, 1985).

The equations for $\mu_c$ and $\sigma_c$ in terms of $\mu$ and $\sigma$ are as follows: $\mu_c = (\exp(\mu + \frac{1}{2}\sigma^2)) - 1$, and $\sigma_c^2 = (\exp(2\mu + \sigma^2))(\exp(\sigma^2)) - 1$. For example, see Nelson (1973) and Kendall and Stuart (1977).

The sample standard deviations are contained in data supplied by NCREIF for the study of sample correlations presented in Graff and Young (1996).

Examination of the effect of unscheduled rent fluctuations on the analysis below shows that rent fluctuations reduce the estimate of the standard deviation of the capital gain component. Accordingly, the estimator for the standard deviation of the capital gain component derived in this section is upwardly biased. However, further analysis shows that the magnitude of the upside bias is very small relative to the derived estimate.

More generally, the probability of any specified loss in property value (e.g., 85%) is an increasing function of the length of the lease term. In order to verify this, it suffices to show that the $Z$-score of the loss is an increasing function of the length of the lease term. So let $f(t) = (at - b)/(ct^2)$, where $a > 0$, $b > 0$, $c > 0$. Then, differentiating with respect to $t$, it follows that $df/dt = (\frac{1}{2})(at + b)/(ct^{3/2}) > 0$ for every $t > 0$. Since the derivative of the $Z$-score with respect to the length of the lease term is always positive, it follows that the $Z$-score is an increasing function of the length of the lease term.
References


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