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Hal B. Heaton
halheaton@byu.edu

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The Use of Securities Data in Determining Discount Rates for Real Property

BY HAL HEATON, PH.D.

When the income approach is used to value real property, appraisers forecast anticipated cash flows from the property and discount those cash flows to arrive at a present value. To do this, appraisers must determine an appropriate rate for discounting the future cash flows. Market value is usually defined as the price between a willing buyer and a willing seller. Appraisers therefore should study the market for the type of properties involved to determine the discount rates used by buyers and sellers of those properties in actual transactions.

Unfortunately, for complex properties, such as industrial or utility plants, which are seldom bought and sold, direct and current data on discount rates are difficult to obtain. As an alternative, appraisers often obtain data from the market for stocks and bonds of companies that own these types of properties and use data extracted from their stock and bond securities to determine discount rates.

This article examines the underlying assumptions necessary to use securities data to value real property. The differ-

ences between appropriate discount rates for securities and those for real properties are dramatic. These differences are even greater if the companies from which the data are extracted are diversified companies in which the subject properties represent only a fraction of the business. Issues of liquidity, transaction costs, diversifiability, limited liability, management difficulties, and others loom large. Several approaches are suggested to adjust for these differences.

Thought Experiment

Imagine building a new operating facility, say, a factory, for \$800 million. Running a factory, unlike a home or an office building, takes substantial knowledge. When properties like homes are assessed for ad valorem tax purposes, the homes are sold empty, the key is transferred to the new owner, and the seller walks away. It is assumed that the buyer knows how to operate the faucets, light switches, air conditioning, and other equipment in the home—or at least can do so with minimal training.

Hal Heaton, Ph.D., is professor of finance in the Marriott School of Management at Brigham Young University in Provo, Utah. He teaches advanced corporate finance and capital markets. He received a master's degree in economics and a Ph.D. in finance from Stanford University. Dr. Heaton also holds an MBA from Brigham Young University.

In contrast, the management of complex operating properties requires substantial knowledge and training. It also requires extensive knowledge about the market, customers, seasonality, existing contracts, and other factors beyond the knowledge of how to operate the actual equipment. As a result, the builder of the factory must spend substantial amounts of time and money training a workforce to operate the facility. In addition, substantial marketing costs must be incurred to build a customer base for the output of the factory.

Suppose these costs amount to \$200 million, so the total “all-in” cost is \$1 billion. Suppose too that the property generates \$100 million a year indefinitely (to keep the math simple) and that the builder requires a 10 percent return to pay for the cost of capital. This leads to an income valuation of

$$\$100 \text{ million}/10 \text{ percent} = \$1 \text{ billion.}$$

Under these assumptions, the builder/manager is fully compensated for all costs inasmuch as the income approach produces the \$1 billion all-in cost of the facility.

Problem One. *At this point, we are in a position to talk about the first problem in ad valorem taxation. What is the value of the facility for tax purposes? Most local property tax assessors don't have to worry about the additional cost of training a workforce to operate the property or building a customer base. Homes and office buildings do not come with an attached workforce that knows how to operate the property nor do they need a customer base, so prices do not reflect the need for a trained workforce or a customer base.*

But when operating properties sell, the buyer frequently is acquiring the trained workforce and customer base as well. Operating managers, employees, and customers usually continue on after the sale. Prices reflect the fact that the buyer does not have to hire and train a new workforce or spend sums of money to build a customer base. Most states do not tax such intangibles. Discounting the cash flows from the facility would include this value, so an

appraiser must estimate this value and remove it from the income approach.

Under these assumptions, the owner of the facility is responsible for all aspects of operations: hiring and firing the workforce; meeting environmental and other regulations; producing regular accounting and regulatory reports; and maintaining and building customer relationships. Liability of ownership may not be limited—if an accident or environmental problem were to occur, the owner could be liable for damages or cleanup far in excess of the \$1 billion cost of building the facility, training the workforce, and developing a customer base.

The owner also is subject to significant liquidity problems. If the owner needs cash, it would take significant time and expense to sell the facility.

Now suppose the owner chooses to issue 100 million equity ownership claims on the facility and list those claims on an exchange. Investors who buy these claims can buy and sell them in small amounts—a few shares at a time. They can buy as much or as little as they wish. They do not have to deal with the hassle and responsibility of hiring and firing employees; meeting environmental or other regulations; filing regulatory or accounting reports; or handling any of the other problems of operating the facility. They can buy and sell these claims in a few seconds with a simple click of a mouse for minimal cost.

Which would an investor rather own—the entire complex or the securities? The securities offer convenience, limited liability, much less hassle, ease in buying and selling as much or as little as desired, and a variety of other advantages. Marketing experts point out that this ease and convenience are worth a lot to investors.

In aggregate, the securities will sell for a large premium above the \$1 billion as a result of these conveniences and the lower risk.

Problem Two. *The facility is still producing the same \$100 million a year, both before and after the shares are issued. If the aggregate value of the securities is, say, \$1.5 billion, then the discount rate that investors use to value the claims on the \$100 million must be dramatically less than the 10 percent the owner/operator of the facility requires. If appraisers gather discount rate data from the securities market, then the rates determined will be much too low when trying to value the facility for ad valorem tax purposes. In most states, the value of the physical property for ad valorem tax purposes is only the \$800 million cost of the physical property. The \$200 million spent to train the workforce and develop a customer base represents an intangible. The additional \$500 million in the traded value of the securities represents all the advantages of liquidity, the lack of management hassles, limited liability, and other advantages the underlying physical assets do not have.*

Once the claims start to trade on an exchange, then a host of other issues can arise. Suppose an analyst for no apparent reason writes a report that he or she expects the earnings to rise in the future. Even if there is no basis for the report, investors may react by increasing the price of the securities. Security prices can reflect rumor, speculation, market sentiment, and a variety of other factors having nothing to do with the operation of the facility.

Now suppose that the company announces that a new, similar facility will be built in a foreign country and is expected to be wildly profitable. The share prices will jump immediately even though the facility has not been built yet. Security prices can reflect the net present value of assets that do not even exist on the lien date. Their price movements and hence risk measurements reflect potential new businesses, future assets, overall stock market idiosyncratic movements, and other factors.

Suppose that another company announces that its operations have specific synergies with the factory, for example, a

patented technology that could reduce costs dramatically or a customer base to which it could cross-sell the products of the factory together with its own products. The new company announces that it wishes to acquire the shares of the factory. The security price will rise—even if the synergies are speculative and may never be achieved.

Problem Three. *Security prices reflect a host of factors beyond the physical assets of the underlying company's real property. These factors increase the value and decrease the discount rates compared to the underlying physical property.*

As this thought experiment illustrates, it would be incorrect to assume that the discount rates derived from securities data equal the appropriate discount rate for a physical property, even if the physical property is the only physical property owned by the equity claims. However, the available data are almost always from securities only. The discount rates used by actual buyers of physical properties are seldom available. Physical properties are seldom traded and even if they are, detailed data from the transaction are often difficult to obtain.

Why Real Property Investments Require Higher Rates of Return than Securities

As the thought experiment illustrates, several factors motivate investors to require higher returns on the ownership of actual physical property than on tradable securities at the same level of risk.

Liquidity

Liquidity refers to the ease of buying and selling an investment. Two investments of equal risk (as, say, measured by the Capital Asset Pricing Model [CAPM] beta) will sell for dramatically different prices if one can be sold quickly, easily, and at minimal cost (such as a share of publicly traded stock) and the other takes substantial time, effort, cost, and

legal/accounting/regulatory review (such as a utility plant).

Property tax assessors have recognized the importance of accounting for differences in liquidity. For example, the *Assessors' Handbook* of the California State Board of Equalization states:

Liquidity Preference. An asset is liquid if it can be readily converted to cash at its current market value. All else being equal, investors prefer to hold assets that are liquid. The return for liquidity preference is the yield component required for holding assets that are not readily convertible into cash. Most financial assets are liquid. Real estate and most business assets, however, are relatively illiquid, and real estate investors must be compensated for this reduced liquidity. (California State Board of Equalization 1998, 63)

The argument based on lack of liquidity is a much stronger one. There is no question that financial assets are significantly more liquid than real estate assets. Rate of return estimates using the CAPM reflect returns on financial assets; thus, in practice at least, the CAPM assumes that all assets are liquid. An adjustment for lack of liquidity can be made in two ways: (1) consider lack of liquidity as an added risk factor and add a premium for it to the cost of equity estimated by the CAPM; or (2) value the real estate asset using the CAPM/WACC [weighted average cost of capital] without any liquidity adjustment, and then apply a liquidity discount to the estimated value. (California State Board of Equalization 1998, 183–184)

The fact that illiquid assets require higher returns than liquid assets is well-established in the finance research literature:

Liquidity (or marketability) is a key attribute of capital assets, and it strongly affects their pricing ... investors prefer to commit capital to liquid investments, which can be traded quickly and at low

cost whenever the need arises. Investments with less liquidity must offer higher expected returns to attract investors. (Amihud and Mendelson 1991, 56)

Liquidity-increasing financial policies may increase the value of the firm. This was demonstrated for our numerical example. ... If the spread is reduced to 0.486 percent [from 3.2 percent] (as in our low-spread portfolio group), our estimates imply that the value of the asset would increase to \$75.80, about a 50 percent increase. (Amihud and Mendelson 1986, 246)

Our study contributes to the academic literature since we believe we offer the cleanest and most precise measures of the value of liquidity. Due to the unique experimental design inherent in REITs [real estate investment trusts], especially the precision of underlying asset values, we are able to not only verify a link between liquidity and required returns but we also are able to accurately quantify these gains. ... Specifically, we find that exchange trading increases shareholder wealth by around 10–15 percent at the margin compared to the relatively illiquid real estate market. However, our estimates of wealth creation jump to around 23 percent when comparing exchange traded claims to nontrading ones. (Benveniste, Capozza, and Seguin 2001, 656)

Finance textbooks also make it clear:

Securities that cannot be converted so quickly and cheaply into cash need to offer relatively high yields. (Brealey, Myers, and Allen 2005, 827)

Real estate professionals are also very aware of this, as stated in *The Appraisal of Real Estate*:

The rate of return on an investment combines a safe rate with a premium to compensate the investor for risk, the illiquidity of invested capital, and management involvement. (Appraisal Institute 2008, 464)

Ease of Diversification

Investors, including the suppliers of capital to purchase real property, desire to be diversified. Finance literature establishes, emphasizes, and strongly recommends diversification of portfolios, because a portfolio can be constructed that has the same return as a single investment but offers much lower volatility, as measured by standard deviation of investment returns, than the single investment. Indeed this diversification benefit is the key insight behind CAPM and its measurement of risk, beta.

Real properties are sold as large, undiversified, single investments. The fact that a large property is “securitized” and claims on the property are sold as shares, master limited partnership participations, or other securities is evidence of the benefit of securitization. This benefit has value to the underlying real property, and hence the claims will sell for premium prices. Since this securitization process takes money, time, and effort, a buyer of an actual physical property must pay less than the final value of the securities to compensate for that money, time, and effort.

The fact that, for a portfolio of a given size, better diversification can be achieved by buying a few equity claims in several properties than by spending the same total amount of money on a large single property represents another reason why investors require higher rates of return on physical property than on securities.

Limited Liability

Owners of real property can face liabilities even greater than the value of the real property, especially if the real property faces sensitive environmental issues. For example, if the owner of real property sustains an environmental disaster, the liabilities stemming from the disaster can exceed the value of the real property and plaintiffs can seize not only the property but also other assets of the owner. Non-environmental lawsuits

triggered by employees, customers, neighbors, governments, or others often lead to claims against other properties or assets of the owner as well.

In contrast, most securities offer limited liability. The investor can lose, at most, only the money invested in the security. Plaintiffs can seize only the assets of the corporation, for example, and may not seize other assets held by the shareholders.

Management Hassle

Real property requires substantial time and effort to maintain and manage, particularly if the property is a complex facility that requires specialized operating knowledge, hiring and training of employees, knowledge of and obedience to rules and regulations, extensive accounting and regulatory reporting of all financial and operating aspects, and many other time-consuming efforts. In contrast, a shareholder does not need to know anything about actually operating or running, say, a refinery, to buy the shares of the company owning the refinery.

As most people who have tried, for example, to buy and manage rental property know first-hand, property management can be a major headache. Even if an owner is lucky and a property requires only minimal time or effort to manage, the possibility that the property will become a major hassle to manage means that investors in real property will require higher returns to compensate for those risks.

Real Options

Ownership of a company provides a number of opportunities that ownership of a single physical property does not. For example, when Wynn Resorts, which owns a casino in Las Vegas, announced a casino deal in Macau, the value of its shares jumped several hundred million dollars in a single day (Stutz 2006). This value was realized even before the new casino was built—the share prices

reflected cash flows from assets that did not yet exist. If an appraiser were to look at the existing asset cash flows only and compare those cash flows against the value of the shares to determine an implied discount rate, the implied discount rate would be much lower than the true discount rate on the existing assets.

This is an example of a real option. Real options reflect the ability of a company to enter into new projects, exploit new technologies, or use its shares to purchase other companies with which synergies might exist. Security prices reflect these real options and hence sell for values higher than the value of the existing physical assets. Discount rates obtained from the higher security prices can thus appear to be lower than the actual required returns on the underlying physical assets.

There are of course many other reasons why securities representing ownership of real property offer multiple advantages over actual ownership of real property.

Adjustments for Differences in Liquidity

Unfortunately, most available data on required returns for debt and equity come from liquid securities markets. Computing returns requires prices, which require transactions data, which require liquidity.

Even assuming that an appraiser has accurately measured the risk (beta) of a real property and has accurately computed the required return on equivalent-risk liquid stocks and bonds, how does the appraiser adjust for this difference in liquidity?

Liquidity Discount

Many appraisers follow the approach suggested by the California State Board of Equalization (1998, 183–184) that computes the present value of the cash flows with the discount rate estimated from liquid securities and then subtracts a discount from the present value.

This liquidity discount can be sizable. Numerous studies provide overwhelming evidence of discounts of 20–40 percent for stocks that are not actively traded, compared to equities that are actively traded. In one study, Silber (1991) found discounts averaging 33.75 percent for transactions involving restricted stock when compared to the price at which the common stock was trading at the same time on an exchange. Restricted or letter stock has all the rights and privileges of common stock, but is not traded on an exchange. Owners of this stock can sell it only in privately arranged transactions, not on an exchange. Bajaj, Denis, Ferris, and Sarin found an average discount of 22.2 percent in their 2001 study.

Longstaff (1995) analytically determined the maximum liquidity discount by using the logic that, at most, liquidity allows the owner to sell at the highest price attainable for a period of time. The value of an option, called a “look-back option,” that allows the holder to sell at the highest price attained during a given period of time thus represents the maximum value of having liquidity during that period of time. Longstaff then offered an equation for the look-back option and computed potential discounts. The value of liquidity becomes a function of time, volatility, and the risk-free rate. The study offered a table of discounts, ranging from less than 1 percent for marketing restrictions of 1 day with a low-volatility stock to more than 65 percent for a 5-year restriction on a highly volatile stock.

Another approach is to explicitly estimate the transaction costs to identify, research, and purchase a property and the costs to issue securities and list them on an exchange and subtract those costs from the estimated value. Unfortunately, this approach is only a partial solution, inasmuch as an adjustment must also be either subtracted from each future cash flow or added to the discount rate to reflect the ongoing costs of remaining a publicly traded company.

Liquidity Premium

The alternative approach is to add a premium to the discount rate to reflect the illiquidity of the investment. Unfortunately, there is less direct guidance on this approach.

One partial solution is to rely on a size premium. Substantial research indicates that, for publicly traded companies, the smaller the company (as measured by market capitalization) the higher the discount rate, holding risk constant (e.g., see Banz 1981). Some studies indicate that much or most of this premium is related to the lower liquidity (as measured by transaction costs) for smaller stocks (e.g., see Loeb 1991).

The *Ibbotson S&P Classic Yearbook* (Morningstar, Inc. 2009, 129–133) provides a more detailed study of liquidity, as measured by turnover. For the smallest quartile stocks, the least liquid offer a return 13.27 percent higher than the most liquid. For the largest quartile of stocks, the least liquid offer a return only 3.42 percent higher than the most liquid. So, although liquidity has more of an impact on smaller stocks than on larger stocks, size and liquidity are two different issues and must be looked at separately. Unfortunately, all this research relates to traded stocks, which are much more liquid than physical property.

Summary

In most states, property tax rules restrict the assessed value to the value of the physical property. Indeed, in many states, equalization rules require that all properties—residential or industrial—be assessed on an equal basis. For large industrial properties or utility plants, this presents a problem because these types of facilities are not bought and sold very frequently and when they are, intangibles are often sold together with the physical property. Little data exist to directly value these properties.

Many appraisers rely on the income approach to value industrial properties

by forecasting the cash flows and then discounting those cash flows to present value. Unfortunately, the data necessary to estimate a discount rate usually come from highly liquid securities markets. These data reflect discount rates necessary to value highly liquid stocks and bonds and may not reflect the discount rates that buyers and sellers use to value highly illiquid physical properties. In addition, stocks and bonds offer a number of benefits that actual ownership of physical properties does not, such as the ability to sell a small piece of the investment (say, a few shares or bonds) to get cash if needed; limited liability; and avoidance of the management hassles of hiring, firing, and training workers as well as complying with the myriad of accounting, disclosure, and regulatory requirements involved in owning an actual physical property.

As a result, it is improper to use securities data without adjustment for valuing physical properties.

To adjust for the fact that the cash flows must compensate the buyer for intangibles such as a trained workforce or customer base, the appraiser must estimate those benefits directly and subtract those from the total estimated value.

To adjust for the fact that the return data usually come from liquid stocks and bonds, an appraiser must adjust the value either by subtracting a liquidity discount or by adding a premium to the discount rate to reflect that the property being valued is not as liquid as the stocks and bonds from which the data are obtained.

In conclusion, an appraiser simply cannot obtain data from liquid, traded securities and apply them to illiquid physical properties without significant adjustments.

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