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# Exploring the Lease Versus Purchase Analysis Model

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In this edition of *Development Incentives Quarterly*, we welcome guest author Jeff Troan, a managing director of Vista Site Selection.

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Part and parcel of economic development incentives are the real estate decisions associated with corporate site selection. Real estate, or the "physical plant" is often a business entity's third largest cost behind labor and benefits. Further, labor and benefits are fairly liquid in an economic downturn, while excess real estate can be very illiquid, and it brings with it a significant mothball cost liability, even if it is not being used. In conjunction with potential real estate incentives, determining whether to lease or purchase is a critical business decision.

Business theory on the subject of real estate varies widely, from portfolios that are virtually all owned, to those virtually all leased. The classic view is that a business should own the real estate associated with its core production capabilities, and lease a limited amount of other assets to provide a flexible portfolio to adjust for changes in economic condition. This is because the imputed debt-cost-of-capital for a company is often well below the return required by a commercial landlord. The counter view is that a business should lease the majority of, or all of, its real property saving needed capital for operating project investments.

Financing or capital leases are a third type of instrument that blend ownership and leasing. This blend can work for many companies. We will not discuss the intricacies of those transactions here, since they are often driven by fact-intensive federal tax analysis and other factors beyond the scope of this article.

No matter a company's underlying theory for the acquisition of its physical plant, the tool utilized to determine whether a particular production real estate requirement is purchased or leased, is the Lease-Versus-Purchase-Analysis Model (LVPA). On its face, the construction of

the LVPA is relatively simple. You create a timeline for the two expenditure streams (owned and leased) and compare the net present value of the after-tax cash flows to determine which solution presents a lower cost.

In the corporate world, risk is composed of the “unknown-unknowns” and the “known-unknowns.” An “unknown-unknown” is a black swan, an occurrence that is so far out on the probability curve that its likelihood is not normally set as a coefficient in the evaluation model. These are essentially dealt with as risk outside the model, or if they involve catastrophic consequences, dealt with as a separate financial impact exercise. A “known-unknown” on the other hand, is a factor with a strong correlation to the model and a coefficient, but there is so much opportunity for variance in the coefficient over the project life, that assumptions, usually mean average, are adopted to run the model.

LVPA modeling does not involve many “unknown-unknowns”, and all the “known-unknowns” are generally filled-in by financial analysts prior to presentation of the model to management. This has a tendency to lead management to assume the LVPA model is a firm point estimate, rather than a quantitative analysis tool, rooted in certain assumptions. This tends to impute a great deal of power to the financial analyst, and often results in a less than optimal implementation decision within a site selection.

The correct way to view the LVPA is to apply sensitivity analysis and Monte-Carlo simulation to the base values to determine the sensitivity of the investment decision to changes in the model’s underlying assumptions. The following chart outlines a relatively simple LVPA model created for a hypothetical $70M facility.

**Item**

**Purchase**

**Lease**

Capital Outlay at Project Inception

($70,000,000)

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Depreciation Assumptions

70% 39yr SL /30%-12y w/bonus depre/SL

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Depreciation Deduction

$10,160,769

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Lease Payment Assumptions

89% amort /10% Int /15 yr lease

Lease Payments

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($116,636,420)

Lease Expense Deduction

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$29,742,287

Effective Federal/State Tax Rate

21% / 4.5%

21% /4.5%

Sales Proceeds After Use

$65,947,549

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Selling Costs

($3,956,853)

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Mothball Carry Costs

($1,920,000)

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Taxes on Sale of Building

(2,914,566)

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Total Then Year Proj Cash Flows

($2,683,101)

($86,894,133)

Discount Rate to NPV (debt rate)

3.0%

3.0%

Net Present Value of Cash Flows

($27,104,075)

($70,289,245)

The initial point estimate for the model shows that the NPV cost of purchasing the facility is $27.1M, versus $70.3M to lease it, a lease premium of 2.6X ownership. If the analysis is treated as a point estimate in management reviews, the conclusion is simple, the company should purchase the new facility.

Common management discussions normally focus on the aggressiveness of the depreciation schedule, the amount that can be worked out of the lease payments, and the effective tax rate assumed over the life of the investment. Testing the above model, we find out that moving an additional $7M of investment to the bonus depreciation category has only a 6% impact on the purchase side of the LVPA. As for the lease payments, money is fungible. The calculation is a pretty fixed function based on the market level for the effective rate of return, the investment, the term and the amount of residual value the landlord is willing to accept. There is no reason to expect much variance here. Finally, tax rates impact both the purchase and lease sides of the LVPA, since both depreciation and rent perform as tax benefits. Varying the tax rates therefore, has virtually no impact on the lease premium ratio of 2.6X. Likewise, selling costs of around 6% and mothball carrying costs of $6sf/year are fairly easily discerned and exhibit only limited fluctuation.

The two factors that do have the most impact on the model are the least discussed: 1) the assumed resale value of the building after the product lifecycle has run its course; and 2) the company's estimated cost of capital.

The model assumes that our product lifecycle is 15 years, and that the building is sold within 24 months of production-stop. During the period of ownership, the building is assumed to appreciate at 2% per year and sell at a 30% discount for wear-and-tear. That results in a fairly conservative estimated resale value.

However, commercial real estate markets at their best, are capricious. If the company finds itself in 15-17 years with a special-purpose-built-building, in a down real estate market, and staring at a significant mothball carry cost, it might easily accept bottom-feeder offers to sell the asset at 20% to 50% of the construction cost. If you assume the building sells for 50% of its construction cost, the NPV cost of ownership rises from $27.1M to $40.0M and the leasing premium drops from 2.6X to 1.7X the cost of ownership. Conversely, if you located to San Jose, California before the dotcom boom, you could have seen a 50% or more increase in property values in 15-17 years. This cuts the cost of ownership from $27.1M to $10.8M, generating a leasing premium of 6.5X the cost of ownership. So, the ability to generate an effective resale with accurate market predictions and a generic cold shell plays a significant role in justifying the ownership model.

Because the timing of cash flows is so different for a purchase scenario over a lease scenario, the most important factor in the model outcome is the company's assumed cost of capital. Companies finance both their physical and working capital requirements through two markets: debt and equity. The required rate of return on debt is generally much lower than that on equity, but the debt financing comes with mandatory principal and interest payments. Further, in the most recent economic period before the Fed began raising rates, the cost of debt financing was held at near free, further skewing the ownership model.

The company in our model has an after-tax debt rate of 3%, while its imputed equity rate (the rate necessary to maintain and grow the stock price and maintain any required dividends) is estimated at 19%. With a 60/40 split between debt and equity, their debt/equity average rate is 12.6%. The hurdle rate (the rate new operating projects must meet to be approved) usually adds a little pad, so the company's hurdle rate is 13.6%.

The initial run of the model uses the 3% debt rate of financing as the company's cost of capital for the new building based on an old convention that assumes low risk, long term assets will be financed with debt. The assumption was reasonable in the mid-twentieth century when debt rates were much higher, and the spread between the debt and equity cost of capital was not so pronounced. However, it creates a serious financial inconsistency in the model in modern markets.

It is a baseline concept in finance that all physical and working capital investment must return the company's mean average debt/equity rate for the company to maintain and grow its stock price, pay any required dividends and service its debt payments. Using the debt rate in the LVPA model has us investing $70,000,000 of the company's capital at well below the return necessary to sustain the company's debt and equity financing. That means that all the non-real-estate projects undertaken by the company have to significantly beat the hurdle rate in their final returns for the company to maintain its stock price. It effectively means that the hurdle rate needs to have a significant spread above the mean average debt/equity rate.

If we now change the discount rate in the model from the 3% debt rate to the 12.6% debt/equity rate or the 13.6% hurdle rate and look at the sensitivity, it has a profound impact on the LVPA decision. The model flips to strongly favor leasing over ownership, with the NPV cost of ownership rising from $27.1M to $57.7M, and the NPV cost of leasing dropping from $70.3M to $38.9M.

**Conclusions:** The LVPA model should never be considered a point estimate, but rather a quantitative analysis tool to estimate the relative value of purchasing versus leasing corporate real estate based on a number of assumptions. Management discussions evaluating the LVPA should center on the resale assumptions in the model and the long-term viability of the chosen real estate market, maintaining a generic design for the cold-shell to facilitate eventual resale, and discerning the implications of the discount rate used to NPV the cash-flows. Finally, using the debt rate of financing in the model strongly skews it towards ownership, and thus requires a significant spread between the company's hurdle rate and its mean average debt/equity rate to make up for the low returns expected from the real estate purchases made via the LVPA model.

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**About Vista Site Selection:** Vista Site Selection is an ancillary business of Vorys and is dedicated to helping companies select the most advantageous and economically viable real estate sites on which to expand existing operations or develop future locations.