

Strategic Advisory

Can lease versus buy spreadsheets be salvaged? The changing decision criteria for IT equipment acquisition.

Enterprises need productive assets in order to grow and remain viable. These assets require investments of corporate capital in one form or another.

Organizations typically have three avenues for acquiring assets:

- buy with cash
- buy with debt (using loan financing)
- lease.

Historically, enterprises have used quantitative lease versus buy (LVB) models to assess these alternatives.

However, in many cases, and especially in the case of technology assets, these LVB models have limited relevancy, since they are often overridden by macro-level factors such as debt covenant restrictions or the need for better IT asset management processes.

Recognizing the main factors which can override an LVB calculation is important for using resources wisely and for prioritizing management values.

LVB - The simple cash flow model

The most basic LVB models are that of simple cash outflows. A LVB decision is based on a comparison of the net present value (NPV) of two payment streams: one time purchase and lease payments made over time. This type of comparison is familiar in a wide range of situations (eg consumer automobile leases, home appliances) and comes as a standard function on handheld calculators. Some versions of this model actually ignore the time value of money (ie NPV aspect) and simply use face value cash payment projections.

This method has only a few input variables and is easy to use, but its simplicity makes it of limited value to enterprises, which have to include other factors such as depreciation and taxes.

Surprisingly, some organizations still use this approach for smaller IT assets, seeing them more as 'appliances' than as 'systems'.

LVB - The quantitative model

This model builds upon simple cash flow models by adding in many other accounting factors. As such, it represents more accurately the financial aspects of LVB choices and may include variables such as:

- depreciable life
- use of any bonus depreciation
- type of depreciation convention (half-year or mid-quarter)
- purchase/buy-out amounts at end of lease
- security deposits and/or other transaction fees
- lease payment period
- any variation in payment amounts (eg delayed payments, step-up payments)
- tax period ending
- tax rates
- tax benefit recognition timing
- AMT rate (if applicable)

- tax loss carry forward periods
- cost of capital (eg ROE-based, cost of debt)
- any debt used in the buy-side of the calculation.

The quantitative model is probably used the most in LVB decisions made by large enterprises for both IT and non-IT assets. With proper inputs, this model calculates two time adjusted financial outputs for comparison: the net financial impact of buying an asset and the net financial impact of leasing that same asset. LVB decision makers compare the two numbers, and in the absence of any overriding factors, choose the financing option with the lowest costs.

The issue of overriding factors

The time-proven LVB model has a few variables that are subject to uncertainty (eg cost of capital over the term of the proposed lease, discretionary use of tax loss carry forwards). As such, it can become irrelevant in a number of very important cases. For example, an LVB calculation might favor buying as the lower of the two costs, but if access to capital is not available or financially feasible, the calculation matters little. Conversely, an LVB calculation might favor leasing as the lower of the two costs, but if asset ownership is required for compliance reasons, the calculation doesn't matter. In these cases, where some other requirement or issue overrides the result of the LVB model, the difference between the two LVB cost estimates might simply indicate the 'cost' attributable to the overriding factor.

What this means is that financial, operational, and IT executives might have (and often do have) reasons to override LVB financial models. These factors should be at least considered and evaluated for impact prior to (or in parallel with) any construction and/or population of an LVB model.

The top 8 overrides to LVB models

1. Debt covenant requirements

Debt covenants often place limits on how much additional debt can be taken on by a firm. This overriding factor means that when new equipment (IT or non-IT) has to be placed into service in pursuit of business objectives, the equipment must either be purchased using cash (without debt) or financed as an operating lease (not recorded as debt on the balance sheet). When cash needs to be used for purposes other than equipment refresh, this factor will override any LVB model calculations.

2. Financial profile/ratio management

The various means of acquiring an asset (cash, debt, capital lease, operating lease, hybrids) have different impacts upon important financial ratios. For example, an operating lease will typically improve RONA (return on net assets) while decreasing EBITDA (earnings before interest, taxes, depreciation and amortization). Acquiring assets with cash typically has the opposite effect on those ratios. The use of debt financing impacts debt-to-equity numbers, and a capital lease has roughly the same impact on EBITDA as a cash purchase. Financial executives have to manage these ratios very closely, since their investor base will typically focus on two or three major ratios. For example, some firms are managed closely to EBITDA, so traditional LVB cost comparisons will be less important than the impact of the LVB decision on earnings. For others, an operating lease might have a lower overall cost than a capital lease (for the same piece of equipment), but a focus on EBITDA would tip the decision in favor of the capital lease decisively.

3. Expense predictability

CEOs and CFOs are increasingly called upon by investors to produce more reliable earnings forecasts. The ability (or inability) to accurately predict revenue, expenses, profits, and growth has become a major factor in company valuations, executive tenure, and executive compensation. Revenue can be difficult to control in today's world, so financial executives must focus on getting as many expense and cost items as possible into a predictable trend. Cost-cutting by itself can only go so far in controlling costs, since it is episodic and often unrepeatable. Expense smoothing on the other hand, can convert capital expense 'spikes' into operating expense 'lines' and help with predictability of the quarterly cost/expense forecasts. Leasing (especially when IT acquisitions can be reliably forecast) is often the only control mechanism to increase predictability and therefore becomes a more important financial value than case-by-case LVB model outputs.

4. Strategic use of capital

Healthy companies have many investment alternatives competing for their cash and favorable debt. Each should be evaluated on the basis of expected rate of return. The fundamental financial task has always been to acquire funds at the lowest cost of capital and invest them in projects with the highest return on assets/equity. This typically means that cash and favorable debt must be used to procure appreciating assets (eg M&A, new market entry, product development) instead of depreciating assets. Committing cash to 'plumbing-level' ROI projects reduces the amount of cash available for investing in initiatives with payback closer to the ROE (return on equity) numbers stakeholders require. Reserving cash and unused favorable debt for such investments is generally considered a better use of resources than buying office technology, regardless of what an LVB calculation might suggest.

5. Process discipline and enforcement

Distributed IT assets (eg PCs, laptops, small printers, and monitors) are generally leased for reasons other than simple financing. Distributed, shorter term leasing is about flexibility, process discipline, standardization, and lifecycle cost avoidance. Most of these variables are difficult to incorporate into classic LVB models, although they are known to be very important.

According to a survey by Global Insight, the top five reasons for leasing PCs would not appear in most standard LVB financial models.

Top 5 reasons for leasing PCs	cited by
Discipline imposed on maintenance and replacement	65%
Protection against obsolescence	54%
Off balance sheet accounting	53%
Convenience	51%
Efficient use of tax incentives	36%

*Based on Global Insight survey findings reported in (Don't) Look Deep into My Lease, CFO Magazine 7/1/06.

Modern lease structures for small IT assets provide significant flexibility such as serial number substitution, partial returns, shared back-end economic recovery, and ease of lease modification that firms require.

The need for centralized and standardized processes is especially highlighted in today's global economy. Process disciplines brought into a sourcing/financing relationship by an enterprise-class multinational partner can be an effective tool for global managers. Process discipline and control is often considered to be a high management priority and leasing-type processes are often used to facilitate both the implementation and the ongoing operation of such controls. The result is a significantly greater

business impact than individual LVB cost comparisons.

6. Need for flexibility for non-uniform equipment lifecycles

For IT equipment, it is well known that user populations can vary widely in knowledge, attitudes toward technology, learning/interests, and overall support for IT initiatives. For example, the needs of a software engineer at a bank creating financial platform software are very different from an order entry clerk at a parts distributor. Some business units and user populations will need access to newer technology before the financial statements indicate that the useful life of their IT equipment is over. Buy-and-hold approaches might make refresh more difficult in such settings, whereas short term equity-based lease financing would facilitate it. Typically, it is important to end up somewhere between 'one size fits all' and 'build to order' by segmenting the user populations and creating separate funding profiles for each. The goal is to enable the technology footprint to change as needed for strategically important users. In business situations where such flexibility is required, financing that provides versatility might be preferred and/or mandated regardless of LVB models.

7. Risk mitigation

For IT assets, several types of risk prevail with consequences often much greater than a calculated spread between alternatives in an LVB model. Three such risks are:

- **Data privacy protection, erasure, and auditing at end of asset life.** Data wiping and the documentation required for compliance records and reporting often require the use of a third-party. This is to leverage any scale, process, and expertise advantages of specialty firms, as well as creating an 'arms length' position for audit reasons.

The business costs of incomplete data destruction are often much greater than the total equipment costs and certainly greater than calculated LVB values. Lessors typically include various levels of data wiping and reporting as part of their back-end processes, and this might be an override factor in itself.

- **Premature equipment obsolescence.** In every initiative, there is the risk that the initiative might be abandoned or that the equipment acquired for the initiative might not actually perform its intended purpose. These ‘abandoned equipment’ scenarios are expensive if the equipment was fully paid for through capital expense (ie incurring a loss by the full write-off of the remaining book value).

Conversely, the risk/cost is lessened if the equipment can be returned to a lessor for a much smaller early termination fee (if any). When an asset has to be retired early due to a change in business requirements or an economic situation, this risk needs to be accounted for which makes LVB comparisons largely irrelevant.

- **Forced equipment replacement.** Related to the above is the risk of ‘forced replacement’. In addition to ‘eating’ the book value of an asset which had to be retired early, firms often have to replace the unit with a new/different one. This often occurs in a ‘forced refresh’ scenario where systems must be replaced early due to a change in software vendor support policies, forced compliance upgrades, or sudden architecture changes.

The cost trade-offs can be modeled on the basis of percentage of assets which might have to be replaced earlier than planned. A sample model can be constructed showing the break even point between purchase and lease in such scenarios. Although leasing is generally less

expensive from a ‘cash out the door’ standpoint (even in cases where there is a small premium over purchase costs), a forced refresh of as little as 2.5 percent of units can justify any such premium.

To the extent that the risk of forced replacement is a concern, comparison numbers of an LVB calculation will be less useful.

These risk scenarios pertain to loss containment and are sometimes included in equipment TCO (total cost of ownership) models. They are not typically included in LVB calculations, but can easily become overrides to any LVB model outcomes.

8. Low tolerance for system outages

Distributed assets such as PCs, laptops, and Intel/AMD-based servers experience significantly higher hardware failures in their post-warranty periods. Studies of large populations of these systems consistently confirm that system failures and resulting business disruptions increase with age and often with usage.

Many of these studies focus on the more failure-prone components (eg power supplies and disk drives), but demonstrate that observed failure rates are always greater than predicted failure rates. Below are conclusions and observations from three such studies.

“In this paper, we present and analyze field-gathered disk replacement data from five systems in production at three organizations, two supercomputing sites and one internet service provider. About 70,000 disks are covered by this data, some for an entire lifetime of five years. All disks were high-performance enterprise disks (SCSI or FC), whose datasheet MTTF of 1,200,000 hours suggest a nominal annual failure rate of at most 0.75 percent. We find that in the field, annual disk replacement rates exceed 1 percent, with 2–4 percent common and up to 12 percent observed on some systems. ... We also find evidence that failure rate is not

constant with age, and that rather than a significant infant mortality affect, we see a significant early onset of wear-out degradation. That is, replacement rates in our data grew constantly with age; an effect often assumed not to set in until after 5 years of use. ... For less than 5-year-old drives, field failure rates are by a factor of 2–12 larger than what the datasheet MTTF suggests. For 5–8 year old drives, field failure rates can be as much as a factor of 30 higher than what the datasheet MTTF suggests. Changes in failure rates during the first five years of the lifecycle are more dramatic than often assumed. While failure rates are often expected to be in steady state in year 2–5 of operation (bottom of the ‘bathtub curve’), we observe a continuous increase in failure rates, starting as early as in the second year of operation.” [Disk failures in the real world: What does an MTTF of 1,000,000 hours mean to you?, by Bianca Schroeder and Garth Gibson, Carnegie Mellon University, September 2006]

“We present the first large-scale analysis of hardware failure rates on a million consumer PCs. We find that many failures are neither transient nor independent. Instead, a large portion of hardware induced failures are recurrent: a machine that crashes from a fault in hardware is up to two orders of magnitude more likely to crash a second time. For example, machines with at least 30 days of accumulated CPU time over an eight month period had a 1 in 190 chance of crashing due to a CPU subsystem fault. Further, machines that crashed once had a probability of 1 in 3.3 of crashing a second time ... disk subsystem failures have a negative correlation to BIOS date, meaning that older machines show a greater incidence of disk subsystem failures. Since disks are mechanical devices, it would not be surprising to find that wear-out is the dominant effect of age-related failure. ... Disk initial failure rate of 1 in 270 (under 8 months of CPU usage) ... we find that DRAM errors are far more likely to occur than would be expected from studies of error rates induced by active radiation sources or cosmic rays. Also, like Pinheiro et al. [2007] and Schroeder and Gibson [2007], who examined disk failure rates in large

data center installations, we find that disk MTTF times are much lower than those specified on disk data sheets. Our findings on conditional failure probability mirror the findings of recent studies of DRAM failures [Schroeder et al. 2009] and disk subsystem failures [Jiang et al. 2008] on server machines: an increase of up to two orders of magnitude in observed failure rates after a first failure occurs.” [Cycles, Cells and Platters: An Empirical Analysis of Hardware Failures on a Million Consumer PCs, by Edmund Nightingale, John Douceur and Vince Orgovan, Microsoft Research, EuroSys’11, April 10–13, 2011, Salzburg, Austria]

“The observed range of AFRs (annualized failure rates) varies from 1.7 percent, for drives that were in their first year of operation, to over 8.6 percent observed in the three-year-old population” [Failure Trends in a Large Disk Drive Population, by Eduardo Pinheiro, Wolf-Dietrich Weber and Luiz Andre Barroso; Google Inc.; Proceedings of the 5th USENIX Conference on File and Storage Technologies (FAST’07), February 2007]

Firms stretching their IT asset lifecycles beyond three years need to recognize this reality and take steps to mitigate the risk to acceptable levels.

Organizations with a low tolerance for system downtime, whether of individual workstations or shared servers, will mandate to refresh their systems before these failure probabilities become failure realities. This is not simply a matter of buying warranty extensions beyond the normal three year manufacturer warranty since this only protects from the invoice expense of repair. It does not in any way reduce failure rates, business disruption during repair/replace processes, or labor support costs.

The core economics of a three year refresh cycle to minimize this disruption risk are heavily in favor of leasing. This override need not apply to the entire distributed asset base,

but would be especially important in some subsets of it such as software developers, executive workstations, customer service applications, customer interfacing systems, and core transaction systems.

Can the LVB spreadsheet be salvaged?

It is important to note that even though select override factors apply to a wide range of equipment types, some of them are especially relevant to IT assets whether longer lived (data center switches) or shorter lived (laptops). For example, the LVB outputs for a five year lease of a giant data center router might differ widely, but if the strategic use of capital principle requires that cash be used to buy a competitor in the marketplace, then an override will likely occur.

What value can LVB models still offer today for IT assets?

One simple value they can offer is a ‘screening’ to make sure that competing lease offers are appropriate for the requirements. Large, enterprise-focused, ‘Macquarie-class’ financial services firms will generally have very similar costs of funds. For example, seven RFQs might generate a ‘bell curve’ of lease rates like that shown in the diagram below. Savvy financial managers know that quotes A and B are ‘too good to be true’ and that quote G would typically reveal some extraneous factor (eg the lessor is

having financial difficulty or has some leverage or power over the prospective customer). Instead, these managers will focus on lessors represented by quotes C, D, E and F knowing that these will allow an ‘apples to apples’ comparison.

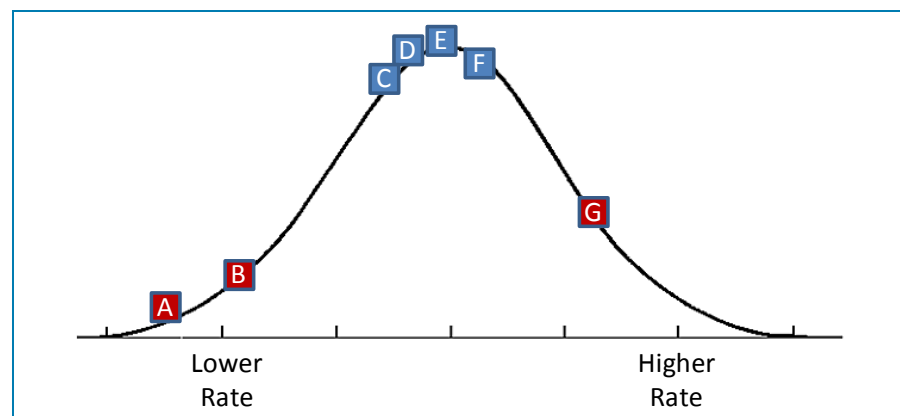
Enterprise-class lessors (whether independent or owned/subsidized by a manufacturer) mainly compete on management values now and less on the financial ‘lowest price’. Since the quotes will be fairly close, operational personnel will present their recommendations to the executive decision makers based on factors such as:

- process quality
- flexibility of lessor
- ease of doing business
- multi-vendor capabilities
- potential for relationship growth
- need for vendor consolidation
- international reach.

In this way, an LVB model in a competitive situation involving multiple lessors can be used to narrow the field to only enterprise-class partners.

The main value a well-crafted LVB model can offer is the forced ‘attention to detail’ it fosters. We need to:

- consider all the costs in such decisions (even if the decision will be based on non-cost items)
- review our cost of capital estimates in asset decisions
- examine all the cost and service elements to hold our financial partners accountable.



We also need to realize that a good LVB model is only a first step (and often not the decisive one) in making sound LVB decisions. Larger issues such as debt covenants and ratio/profile management might make an LVB model a waste of staff time.

Financial managers today will be wise to run through the override checklist below before requiring their teams to construct, populate, and analyze traditional quantitative LVB models.

Override checklist

- Are there debt covenants which restrict us from borrowing to buy these assets?
- How would ownership of these assets affect our critical financial ratios?
- Do I need to transform this asset buy from a CAPEX spike to an OPEX line?
- Are there other investments for this amount of money which would generate ROE-level results?
- Do I need to use this IT refresh to implement large scale process improvements or standardization?
- Do I need the flexibility to vary how long I keep an IT asset (and thereby vary how much I pay for it)?
- Do I need to decrease my risk of data leakage problems for end-of-life assets?
- Do I need to decrease my risk of book-loss due to early obsolescence?
- Do I need to decrease my risk of unforeseen 'forced' equipment replacements?
- Do I need to decrease my risk of downtime for some group of systems?

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