

JOURNAL

OF EQUIPMENT LEASE FINANCING

VOLUME 38 • NUMBER 2 • SPRING 2020

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Residual Value and the Value/Risk Trade-off in Lease-Versus-Buy Decisions

By Andrew Apps

Entities with limited appetite for residual value risk may choose to lease assets because of the risk transfer benefit, even when value economics favor the buy option, provided the value impact of leasing is not too negative. This article provides a framework for measuring risk transfer and making the value/risk trade-off in this situation, including for leases with renewal options, by means of a value to risk ratio.

The Pretoria Protocol for the Financing and Leasing of Mining, Agricultural and Construction Equipment Is Adopted

By Phillip L. Durham and Simon Stanley

Adopted in November 2019, the Pretoria Protocol is expected to reduce the risk of finance, and increase access to financing, for sales and leases of mining, agricultural, and construction (MAC) equipment. However, much work lies ahead before the protocol can enter into force.

Innovation: Evolution or Revolution?

By Katie Emmel

What constitutes innovation in our industry? What has stopped organizations from innovating? Is now the time to innovate? Business first or customer first? Does innovation need to be evolutionary or revolutionary? These are the questions a group of finance and technology experts recently convened to explore.

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By Andrew Apps

Entities frequently face decisions as to whether to own or lease the assets that they require. Sometimes these decisions can be relatively straightforward. For example, leasing is often a convenient and compelling solution where assets are likely required only for the short term, while finance/capital leases, where the lessor does not take a meaningful residual value risk, can sometimes be attractive for long-term needs.¹

There remains a large group of situations where assets are required beyond the short term and a lessor is willing to take material residual value risk, for which the lease/buy decisions are often much less straightforward. At the heart of these considerations — and at the heart of their difficulty — is the uncertainty, if an entity chooses to own an asset, as to the secondhand value it can achieve in the market when it no longer requires the

asset. We will refer to this as the *salvage value*, which may be lower than the asset's actual residual market value if (for example) the entity has limited access to the relevant secondary markets.

This article considers the interplay between value and risk, viewed as one of four dimensions for potential lessees evaluating lease/buy decisions for medium to long-term needs (Table 1).

Leasing will often be the natural choice when a proposed lease is value positive compared with ownership. However, risk-averse entities may choose to lease assets even when value economics favor the buy option, in order to transfer salvage value risk to the lessor, provided the value impact of leasing is not too negative. Experience shows that stronger credits may also at times enter into value-negative leases.

This article develops a framework for measuring risk transfer and for

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Table 1.

Four Dimensions of Lease/Buy Analysis

Dimension	Description or comment
Borrowing capacity/cash	Some businesses (e.g., financially constrained entities) may find it easier to negotiate a lease for an asset that they need, rather than to borrow additional funds to buy it. ^a
Accounting metrics	Decision-makers may be influenced by the impact on externally published or internally targeted accounting or financial metrics such as capital employed (on versus off balance sheet), capital expenditure targets, or return on capital employed. Under the new lease accounting standards, the impacts of lease or purchase on capital employed and long-term debt will be far more similar for medium or long-term needs than in the past, ^b which could reduce the importance of these metrics in lease/buy decisions.
Value and risk	Value is a key driver for many lease/buy decisions. However, it is also important to understand and compare the risks of both lease and ownership options, by looking not just at “single point” estimates of value but at the range of possible value outcomes under each option. We therefore view value and risk as two elements of the same dimension rather than as separate dimensions.
Environmental factors	Various internal or external factors can constrain or prohibit ownership options or (more rarely) leasing options, such as outsourcing strategies, ^c asset replacement practicalities, ^d regulation, ^e joint venture partners, ^f third-party “cost plus” contracts, ^g or shortage of specialist operating skills. ^h This dimension, although listed last, should in practice be considered first because of the magnitude of the impacts when present.

a. See Andrea Eisfeldt and Adriano Rampini, “Leasing, Ability to Repossess, and Debt Capacity,” *Review of Financial Studies* 22:1621-1657 (2008).

b. Under historical accounting standards, leases where there is a material residual value typically impact neither the balance sheet nor the long-term debt of the lessee. In such situations, entities reporting under International Financial Reporting Standards or U.S. GAAP accounting standards will in future typically capitalize upward of 75% of the asset’s value (and book a similar level of long-term debt) if they lease the asset, compared to 100% of the asset’s value if they purchase it.

c. Where an entity has outsourced certain activities, it may have a reduced appetite for owning any associated assets.

d. Practicalities include the ease and desirability or otherwise at the end of the lease term of replacing the asset and/or meeting any return conditions in the lease. Thomas Zeller, Brian Stanko, and Andrew Tressler, “How Risky Are Your Lease vs. Buy Decisions?” *Management Accounting Quarterly* 17(1):9-18 (2015), give the example of warehouse shelving that would require substantial effort to replace when the lease terminates,

Source on all tables: Author.

in which case the entity is likely either to keep extending any lease or to purchase the asset at the end of any initial lease term.

e. E.g., the U.S. Jones Act restricts what type of entities can own or operate ships transporting goods between U.S. ports.

f. E.g., a financially weaker joint venture partner may veto ownership options for an asset that the joint venture requires.

g. Where an entity uses an asset to service a third-party contract on a cost-plus basis, the cost reimbursement provisions can sometimes make leasing more favorable than ownership — e.g., if there is limited provision under ownership for reimbursement of the interest cost/return on capital/residual risk taken. (See Peter Nevitt and Frank Fabozzi, *Equipment Leasing*, 4th ed. New York: Wiley, 2000, p. 24.)

h. The desired asset and its associated maintenance/operating skills may be available only via a lease — e.g., for certain types of drilling rigs in the oil industry and for some test equipment. (See Tevis Martin, “Common Sense and the Lease vs. Buy Model,” *Evaluation Engineering*, April 1999, available online at <https://www.evaluationengineering.com/home/article/13001337/common-sense-and-the-lease-vs-buy-model>.)

The range of net present cost (NPC) outcomes under ownership will usually be larger than those under leasing, compounded by the difficulty many entities face in estimating salvage values.

jointly considering value and risk in such situations. We also identify four factors that have a material impact on this value/risk trade-off. The findings are relevant both to potential lessees, by providing a practical methodology for weighing a negative lease value against the risk-transfer benefit, and to researchers interested in factors that lead entities to lease rather than buy the assets they need.

The approach is applicable to many asset types that traditionally have attracted operating/true leases: for example, vehicles, IT and office equipment, nonspecialist equipment, buildings, and big-ticket mobile assets such as railcars, aircraft, and ships.

We focus on depreciating assets expected to be required for the medium or long term relative to the asset's useful life (e.g., for at least a quarter of the asset's useful life²), which have a meaningful residual value at the end of the proposed lease term, and with residual value risk in any leases at that point borne by the lessor.³

For simplicity, we also assume that the primary risk transferred to the lessor (other than credit risk) is residual value risk.⁴ We use the term *entity* throughout to refer to a business or public entity facing a lease/buy decision, occasionally using *lessee* when the context is clearly a lease rather than ownership.

MEASURING VALUE AND RISK TRANSFER IN LEASE/BUY DECISIONS

We use the standard method⁵ to calculate value via the net advantage to leasing (NAL), equal to the expected net present cost (NPC) of ownership minus the expected NPC of leasing. We measure risk as the uncertainty in the NPCs under ownership and leasing, expressed as "present values at risk" so as to be comparable with the NAL. The entity would determine the *buy risk* and the *lease risk*, which capture the potential value downsides under each option.

The range of NPC outcomes under ownership will usually be larger than those under leasing, compounded by the difficulty many entities face in estimating salvage values. This difference gives rise to *risk transfer*, which we define as the *excess of buy risk over lease risk*.⁶

Measuring the Buy Risk

The estimated salvage value is typically the only uncertain component in the NPC under ownership calculation, as we are assuming that salvage value risk is the primary risk transferred under the lease. In the worst case, the salvage value under ownership would be zero (e.g., for a totally obsolete asset). So the simplest measure of the buy risk is to take the present value of the entire after-tax salvage value estimate included within the NAL calculation.

Entities with access to secondhand historical market data can obtain a more accurate estimate of the buy risk by establishing a severe salvage value downside estimate.

Entities with access to secondhand historical market data can obtain a more accurate estimate of the buy risk by establishing a severe salvage value downside estimate. For example, this could be at the 5th percentile (1 in 20 case) based on forecast secondhand market values for the asset and the distribution or volatility of historical secondhand market values, ideally determined over at least two economic cycles. In this case, the salvage value at risk is simply the difference between the expected and severe downside salvage values.⁷ The two methods are illustrated in Table 2.

Measuring the Lease Risk

For simple leases (leases with fixed rentals, a single primary period, no extension, early termination or purchase options, and where the asset is certain to be handed back at the end of the lease), the lease risk will be zero. For other leases, risk may arise from:

- contingent rentals that depend on usage, turnover, or an external index such as inflation
- the cost of meeting any stipulated return conditions
- uncertain extension rentals or purchase option costs, linked to an external index or market rate

Table 2.

Calculating the Buy Risk – Example

ABC Corp. requires a Superwidget for 5 years. The Superwidget has a 10-year estimated useful life and costs 100. ABC Corp. has a tax rate of 30% and an after-tax cost of capital of 9%. ABC Corp. forecast a high salvage value of 59 in 5 years' time, but adopt a more prudent midrange estimated salvage value of 45 after 5 years for the purposes of the NAL calculation.

- In the worst-case view, the buy risk is $45 * (1 - 30%) / 1.09^5 = 20.5$.
- If, however, ABC Corp. can forecast a severe downside "1 in 20" salvage value of 31, based on historical secondhand market data, then the pretax salvage value at risk would be 14, and the buy risk would be $14 * (1 - 30%) / 1.09^5 = 6.4$.

For both methods, the formula is^a:

$$\text{Buy risk} = \frac{\text{After-tax salvage value at risk for the entity}}{(1 + r)^{\text{(Required duration in years)}}$$

where r = discount rate for the salvage value (e.g., entity's after-tax cost of capital).

a. This is the relevant formula where the required asset duration is known upfront. We will consider later on in this article the situation where the required asset duration is uncertain.

The net advantage to leasing (NAL) will often be positive if the lessor can access material economic benefits not available to the entity and is willing to pass these on through a lease.

or negotiated toward the end of the primary period (see also Table 9).

The risks here often have no upper bound, so the lease risk should capture the impact on the lease NPC of a severe 1 in 20 case of higher than expected rentals⁸ (Table 3).

THE VALUE/RISK TRADE-OFF WHEN THE NAL IS NEGATIVE

Nature of the Value/Risk Trade-off

The NAL will often be positive if the lessor can access material economic benefits not available to the entity and is willing to pass these on through a lease. For example, a captive lessor may be able to offer a rather higher residual value

than the entity’s expected salvage value.⁹

Where the lessor has no inherent advantage over the entity, however, and we are considering medium to longer term leases for stronger credits (e.g., rated entities), we would typically expect the NAL to be negative, as the lessor’s cost of funds plus margin (allowing for credit and asset risk) would normally be higher than the entity’s own borrowing cost in the bond markets.

Experience shows, however, that entities still choose to lease some assets where the NAL is negative — for example, because of perceived nonquantified leasing benefits such as convenience, transfer of risk, or optionality, even where a

Table 3.

Lease Risk and Risk Transfer – ABC Corp. Example

ABC Corp. has obtained some 5-year lease proposals for the Superwidget. One proposal features a low initial rental, with a market-related rent review after 2 years. ABC Corp. estimates that the lease’s net present cost will lie between 50 and 60 with 90% likelihood, depending on the review, giving:

- an estimated lease NPC of 55 (i.e., a midrange NPC with balanced upside and downside)
- a lease risk of 5

The NPC and lease risk capture the *range* of possible lease outcomes (i.e., an NPC of 55, plus or minus 5), thus reducing the need for ABC Corp. to guess in advance the result of the future rent review.

This lease would reduce the value downside risk/uncertainty from 20.5 under ownership, taking the worst-case view of salvage risk (per Table 2), to 5 under the lease, giving a risk transfer of 15.5. The risk transfer would be 1.4 if ABC Corp. took the market view of salvage risk.

Provided the expected salvage value assumption under ownership in the NAL calculation is reasonable, the potential upside and downside for the actual versus expected salvage value will tend to be balanced.

lease outcome is not dictated.¹⁰ We shall see shortly that this is to be expected for risk-averse entities in particular.

Entities could simply view the negative NAL as insurance against the risk under ownership of a lower salvage value than expected.¹¹ Unlike typical insurance risks, however, if the entity owns the asset, it not only bears the possibility of loss but also retains any salvage value upside. Provided the expected salvage value assumption under ownership in the NAL calculation is reasonable, the potential upside and downside for the actual

versus expected salvage value will tend to be balanced, and similarly for any lease uncertainties.

Therefore, choosing to lease rather than buy is economically equivalent to receiving value equal to the NAL in return for reducing the risk (two-way variation in value outcomes) by an amount equal to the risk transfer.¹² Hence the NAL and risk transfer capture the range of possible lease-versus-buy value outcomes (Table 4).

From a value and risk perspective, therefore, entering into a simple lease rather than ownership is economically equivalent for the

Table 4.

Range of Lease-Versus-Buy Value Outcomes – ABC Corp. Scenarios

ABC Corp. is evaluating two 5-year lease proposals for the Superwidget. The NAL and minimum/maximum values below now capture the *range* of possible lease-versus-buy value outcomes for each scenario, avoiding the need for ABC Corp. to rely on a single (likely incorrect) guess as to salvage value.

Lease-versus-buy scenario	Range of value outcomes for lease versus buy			Risk transfer (per Table 2 and Table 3)
	Expected (NAL)	Min	Max	
A. 5 year simple lease, worst-case view of buy risk	- 4.3 ^a	-24.8	16.2	20.5
B. 5 year simple lease, market view of buy risk	-4.3	-10.7	2.1	6.4
C. 5 year lease with low initial rental and rent review after 2 years, market view of buy risk	-1.6 ^b	-3.0	-0.2	1.4

a. Assumes expected NPCs are 53.4 for buy and 57.7 for the simple lease

b. NPC range for buy is 57.0 to 59.8, as buy risk is 6.4. Expected lease NPC is 55, range 50 to 60. Leasing reduces the 2-way NPC variation by 1.4. NAL is -1.6.

The larger the ratio, the lower the additional downside value protection under leasing compared with ownership, and the higher the potential opportunity loss of value upside.

entity to receiving the NAL and eliminating salvage value variation.¹³ Expected utility theory then tells us that a risk-averse entity may prefer leasing over ownership even if the NAL is negative, as long as the negative NAL is not too large.¹⁴

Table 5 shows how value and risk can play into the overall lease/buy decision for such an entity.

A Framework for Approaching the Value/Risk Trade-off

When the NAL is negative, we define the *value to risk ratio* as the value cost of the lease (negative NAL) divided by the risk transfer, expressed as a percentage. This provides a basis for making the value/risk trade-off by determining whether the value cost of the lease is justified by the scale of the risk transfer. In other words, the larger the ratio, the lower the additional downside value protection under leasing compared with ownership,

and the higher the potential opportunity loss of value upside.

Table 6 shows how this could apply in the ABC Corp. example.

We can now articulate two key principles for the value/risk trade-off:

- The negative NAL should not exceed the risk transfer (value to risk ratio less than 100%). Otherwise the NPC of the severe downside ownership case would be lower than that of the severe leasing case, and the lease would have no risk-transfer benefit. Indeed, if the negative NAL starts even to approach the risk transfer, the entity would almost certainly be better off buying the asset.
- Different entities will draw their boundaries for the value/risk trade-off in different places, depending in particular on their capacity to bear salvage risk downside.

Table 5.

The Value/Risk Trade-off Within the Overall Lease/Buy Decision

Value and risk outcome	Impact on lease/buy decision
NAL positive	“Obviously lease,” subject to proper evaluation of the economics if the entity were to require the asset beyond the primary period.
NAL negative but acceptable relative to the risk transfer	Either lease or buy may make sense. The final decision may be driven by other factors.
NAL negative, unacceptable relative to the risk transfer	“Obviously buy.” The entity would adopt a lease solution only as a last resort after exhausting all other avenues.

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We would expect entities with higher capacity to absorb salvage risk downside to accept only low value to risk ratios because of the potential salvage value upside under ownership.

Table 6.

The Value/Risk Trade-off – ABC Corp. 5-Year Lease-Versus-Buy Scenarios

Lease-versus-buy scenario	Value to risk ratio	Lease/buy value range, per Table 4	Comment
A. Simple lease, worst-case view of buy risk	21%	NAL: -4.3 Range: -24.8 to +16.2	If the asset supported a fixed-term contract generating expected value of 10 if owned, a risk-averse entity might prefer to lock in a positive value of 5.7 through a fixed lease, rather than own it and risk a value loss of up to 10.5. Less risk-averse entities might still prefer to own.
B. Simple lease, market view of buy risk	67%	NAL: -4.3 Range: -10.7 to +2.1	The potential present value upside foregone (10.7) would be five times the additional downside protection (2.1) offered by the lease, making it unattractive for all but the most risk-averse entities.
C. Lease with rent review after 2 years, market view of buy risk	114%	NAL: -1.6 Range: -3.0 to -0.2	An unacceptable value/risk trade-off. The lease would be value negative versus ownership even for a severe salvage value and lease downside, as the negative NAL exceeds the risk transfer, and so the worst-case lease NPC (60.0) is higher than the worst-case buy NPC (59.8).

We would expect entities with higher capacity to absorb salvage risk downside to accept only low value to risk ratios because of the potential salvage value upside under ownership. Entities with lower capacity to absorb salvage risk downside, however, may be prepared to accept higher value to risk ratios. An entity's capacity to bear salvage risk downside will

clearly depend on the entity's overall financial strength, but there are other factors to consider.

Correlation of Earnings With Residual/Salvage Value

Suppose an entity with limited capacity to bear salvage value risk downside is acquiring a core asset whose residual value is strongly positively correlated with

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Unless demand is constant over time, the asset portfolio will likely contain a spread of time commitments, to service long-term core demand while remaining responsive (via leases) to short- and medium-term demand fluctuations.

the health of the entity's business sector. A lease may provide valuable downside protection in this instance: if instead the entity owned the asset, then a lower than expected salvage value would likely coincide with a downturn in the entity's overall cash flow.¹⁵

However, where the asset's residual value is *negatively* correlated with the entity's other risks and the NAL is negative, it would make little economic sense to give up value to transfer salvage risk that would already be naturally offset within the entity if it owned the asset.¹⁶

Where the risks under ownership and under leasing have different correlations with the entity's future earnings, we can add multipliers to the buy-risk and lease-risk calculations to capture the extent to which the respective risks are offset by the entity's wider activities.¹⁷

Managing Portfolios of Similar Assets

Entities managing multiple similar assets also need to consider the *portfolio effects* of the overall asset class. Unless demand is constant over time, the asset portfolio will likely contain a spread of time commitments, to service long-term core demand while remaining responsive (e.g., via leases) to short- and medium-term demand fluctuations.¹⁸

In this situation, the sell-side salvage risks under ownership will tend to be *negatively* correlated with the buy-side risks of acquiring

new capacity if both of the following apply for this asset type:

- there are good cross-correlations over time between the cost of new assets, secondhand values and short- to medium-term lease rates, and
- the entity is regularly in the market for new capacity (whether owned or leased) — that is, there is sufficient buy-side activity to neutralize the risks of the sell-side activity.¹⁹

In such cases it would make sense for entities to own some of the assets required for the longer term, as the salvage risk would be naturally hedged by the entity's regular acquisitions of new capacity. The case study in Table 7 illustrates this.

FACTORS AFFECTING THE VALUE TO RISK RATIO

We consider below four factors that affect both the NAL and the risk transfer, and which therefore have a material impact on the value to risk ratio and on the value/risk trade-off.²⁰ We will illustrate the impact of each factor on our ABC Corp. 5-year simple lease, and using a lease/buy model and some ABC Corp. assumptions to model the first three factors, assuming a value to risk ratio threshold of 25% with zero lease risk (so that risk transfer equals buy risk).²¹

A fifth factor — the range of uncertainty in the residual market value — will also directly affect both the buy risk/risk transfer and the NAL, but the impact on the latter is harder to model.²²

There are various ways for entities with limited experience of owning an asset class to forecast an asset's residual value, even though lessors rarely disclose their own such assumptions.

Table 7.

Case Study – Modeling the Risk of a Major Oil Company's Future Tanker Requirements

An oil company wanted to determine whether to use ownership or leases to meet its long-term shipping needs. There are strong cross-correlations for oil tankers between new-build costs, secondhand asset values, and shorter term lease rates. Modeling^a showed that there was no material difference between the total cash flows at risk in the ownership and lease strategies: that is, there were no discernible risk-transfer benefits from using leases to meet the long-term needs.

a. Future shipping requirements were determined and assumed to be met by an appropriate combination of voyage charters, one-year "time charters," and either ownership or 10-year leases. Monte Carlo simulation was then used to simulate the forward voyage charter, time charter, and new-build and secondhand value rates, with the four time-series of random variables generated in such a way as to preserve historically observed cross-correlations. For each simulation, the total cost of accessing the new requirements in each year was determined, from which the 1 in 20 (5th percentile) cash flow at risk was determined. The conclusion remained robust under a series of stress tests such as increases or decreases over time in the entity's overall shipping demand.

The Estimated Residual Market Value of the Asset

This critical input affects both the negative NAL (as it impacts rentals) and the risk transfer, but in opposite directions. Figure 1 shows how the NAL, risk transfer (left-hand scale), and value to risk ratio (right-hand scale) for the 5-year ABC Corp. lease vary with the estimated residual value. The lower the acceptable value to risk ratio for this ABC Corp. project, the higher the required estimated residual value for the lease to be acceptable. In this case, a value to risk ratio of 25% or less would require an estimated residual value of at least 43% of asset cost.

There are various ways for entities with limited experience of owning an asset class to forecast an asset's

residual value, even though lessors rarely disclose their own such assumptions.²³

The Entity's Ability to Achieve Full Market Value When Selling the Asset

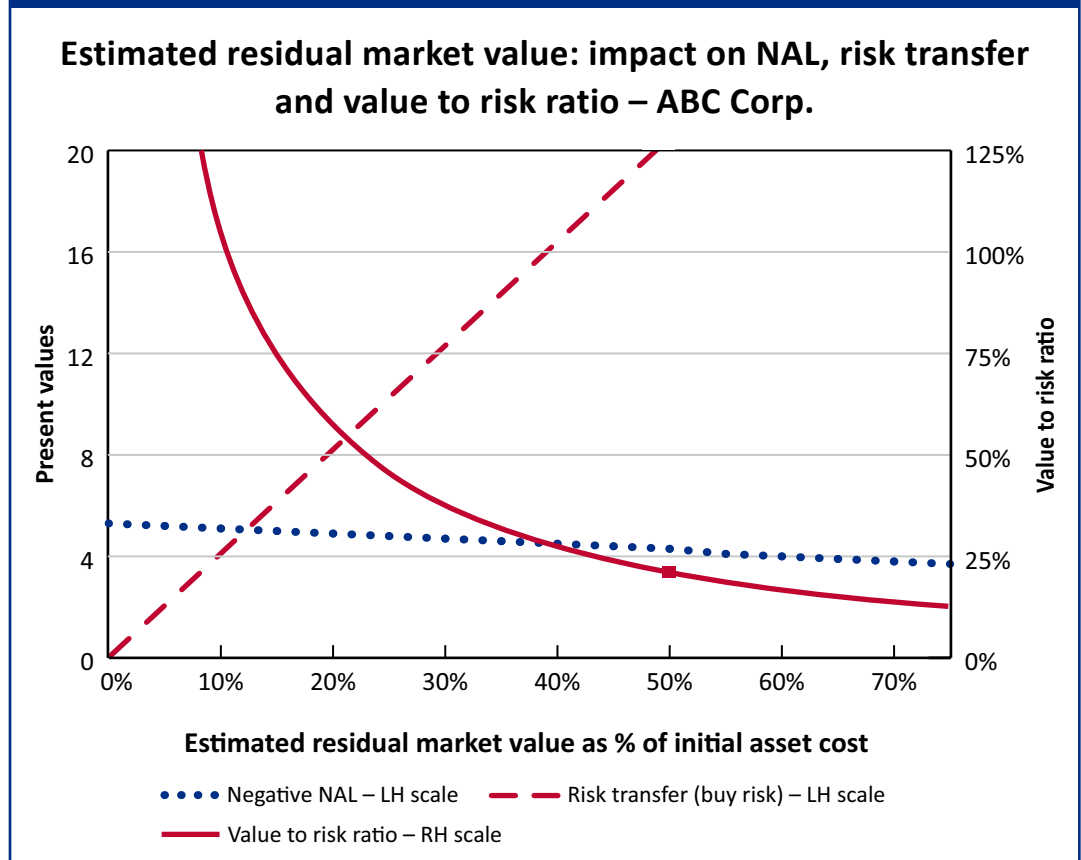
Another factor is the extent to which the entity and lessor can achieve similar disposal proceeds (or realize value through ongoing use of the asset, in the case of the lessor) once the entity no longer requires the asset — that is, how the salvage value compares with the market residual value.

This affects the negative NAL and buy risk in the same direction. As we have seen, the NAL may be positive if the entity is disadvantaged in this respect. Table 8 shows some typical situations.

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Figure 1. Impact of Estimated Residual Market Value on the Value to Risk Ratio



Source: Author’s model (5-year lease, ABC Corp. assumptions but varying the estimated residual value of 50%)

Table 8.

Entity’s Position in the Secondhand Market – Some Typical Situations

Nature of secondhand market	Entity as owner disadvantaged relative to lessor?	Examples
Transparent	Entity on a par with lessor	Financial lessors in broker-dominated markets such as shipping
Transparent	Entity disadvantaged due to limited experience selling in this market	Entities requiring commercial vehicles, for whom this is not their core business
Opaque	Entity significantly disadvantaged	Some IT and office equipment

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As the lease length increases, the NAL will usually become less positive or more negative, whereas both the absolute salvage value and the applicable discount factor will decrease, and so the risk transfer will fall sharply.

Figure 2 shows how the NAL, risk transfer, and value to risk ratio for the 5-year ABC Corp. lease vary with the entity’s salvage value (as a proportion of market value). This lease is value positive, provided the salvage value is less than 71% of the market value, while the value to risk ratio is less than 25%, provided the entity can achieve no more than 95% of the market value.

How Long the Asset Is Required for, Relative to the Asset’s Useful Life

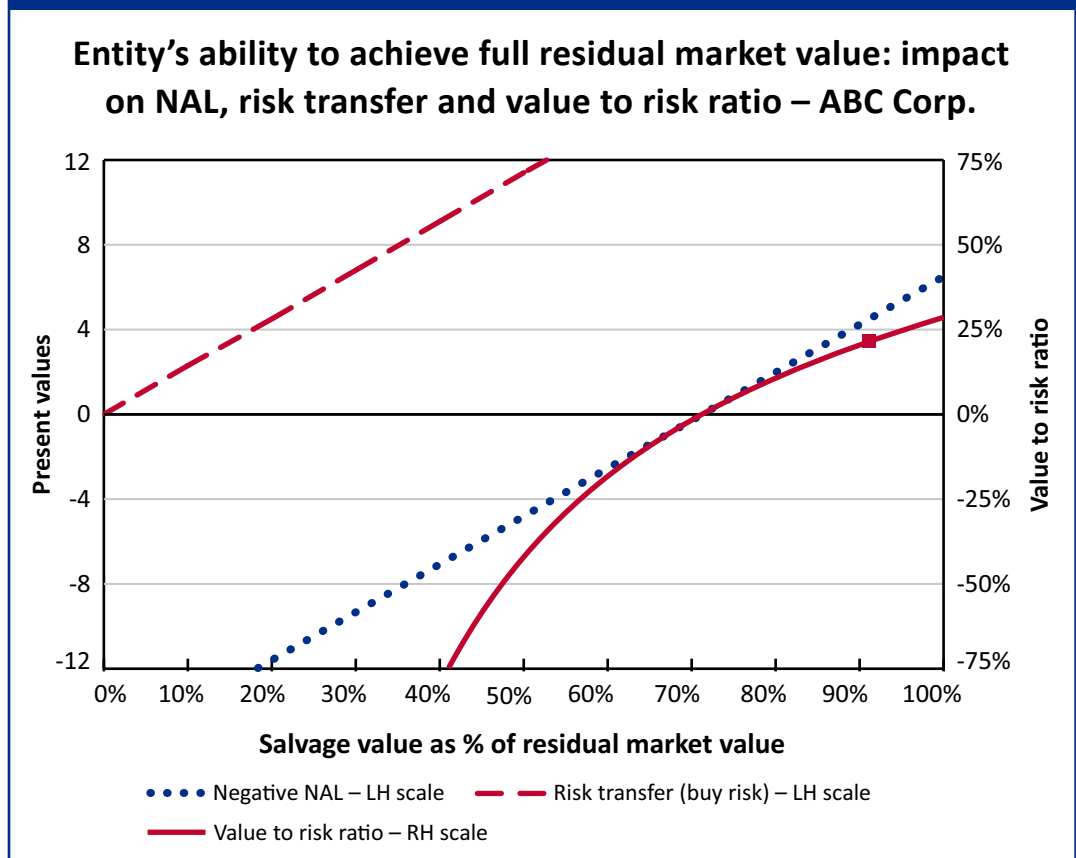
As the lease length increases, the NAL will usually become less positive or more negative,²⁴ whereas

both the absolute salvage value and the applicable discount factor will decrease, and so the risk transfer will fall sharply. Figure 3 shows how the value to risk ratio increases rapidly with lease duration for the ABC Corp. lease, where the asset has a 10-year life.²⁵

This simple analysis shows why:

- Leases are the obvious economic (as well as convenient) solution when an asset is required for only a relatively short proportion of its useful life.
- Ownership generally becomes increasingly attractive as the asset requirement lengthens.

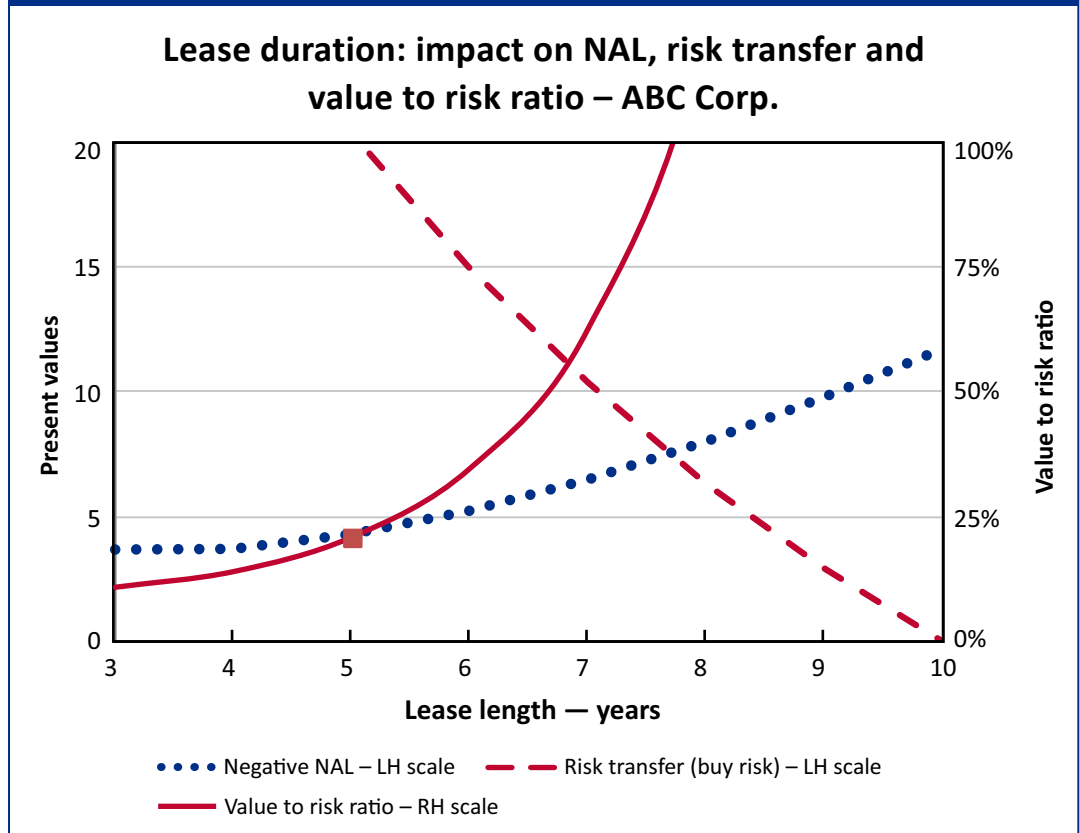
Figure 2. Impact on Value to Risk Ratio of Entity’s Ability to Achieve Full Market Value



Source: Author’s model (5-year lease, ABC Corp. assumptions but varying the 90% salvage value assumption).

In practice, many business requirements for assets do not have a fixed duration that is known upfront. This uncertainty about how long the asset is actually required for has a major impact on lease/buy decisions.

Figure 3. Impact of Lease Duration on the Value to Risk Ratio



Source: Author’s model (ABC Corp. assumptions but varying the 5-year assumed lease duration).

- The lower the acceptable value to risk ratio for a project, the lower the maximum acceptable lease duration before ownership becomes preferable. For example, in Figure 3, a value to risk ratio of 25% or less would require a lease length of less than 5.5 years.

We conclude that leases of depreciating assets for the majority of their useful life will generally be hard to justify *solely* by reference to risk transfer, as the risk transfer will be too low relative to the negative NAL.²⁶

Uncertainty About How Long the Entity Requires the Asset

So far we have mainly considered simple leases, where an asset is required for a fixed period and will be handed back to the lessor (if leased) or sold at the end of the fixed period (if owned).

In practice, many business requirements for assets do not have a fixed duration that is known upfront. This uncertainty about how long the asset is actually required for has a major impact on lease/buy decisions. Firstly, it affects the design of any proposed leases, such as the initial lease term and options at

The risk transfer if a lease is to be renewed will depend on the nature of the renewal option. In this case the lease and buy options may both have significant uncertainty, so that both the buy risk and lease risk will need to be considered.

expiration. For example, the entity may be able not only to hand the asset back, but also to:

- purchase the asset during or at the end of the lease.
- extend the lease for a secondary period, either via extension options agreed upon upfront or by negotiation at the end of the lease. (This can sometimes result in the lessee paying for an asset several times over when all the extensions are taken into account.)
- negotiate a lease for a new replacement asset when the first lease finishes.

Secondly, this uncertainty affects both the negative NAL and the risk transfer, in opposite directions.

The NAL will usually be less positive or more negative if a lease is renewed, compared with when the asset is handed back at the end of the primary period, while the buy risk will reduce due to the lower salvage value.

The risk transfer if a lease is to be renewed will depend on the nature of the renewal option; in this case the lease and buy options may both have significant uncertainty, so that both the buy risk and lease risk will need to be considered. Table 9 shows typical risk outcomes for three lease renewal options exercisable at the end of an initial term.

When the duration for which the asset is required cannot be

Table 9.

Typical Risk Outcomes for 3 Lease Renewal Options, Assuming They Are Exercised

Renewal option	Buy risk	Lease risk	Risk transfer
Fixed-price purchase option	Depends on duration, not on type of option.	Same as buy risk	Zero. Asset will be owned during the extension period irrespective of whether it is initially owned or leased.
Fixed-rate extension	Usually lower than buy risk at end of primary period.	Zero	Equals buy risk
Market-rate extension		Lease risk may be material, and for longer extensions could be comparable to or higher than buy risk, giving rise to low or negative risk transfer. Buy risk depends on asset value at end of secondary period, whereas lease risk depends on market conditions at end of primary period, when the market value and discount factor will be higher than at the end of the secondary period.	

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If the asset is likely required for 7 years, with just a small chance of being returned after 5 years (if, for example, there is an unexpected technology change), then the lease/buy decision should clearly give greater weight to the 7-year rather than the 5-year economics.

determined upfront but depends on future events, the economic impacts can be evaluated by:

- identifying the most relevant scenarios and estimating their probabilities of occurrence²⁷
- determining the NAL, buy risk, lease risk, and risk transfer for each scenario
- calculating the blended NAL and risk transfer, probability weighted across the relevant scenarios²⁸

To illustrate this, suppose ABC Corp. needs a Superwidget for either 5 or 7 years, and that ABC Corp. will either buy the asset (and sell it when no longer needed) or will sign a 5-year lease, and exercise a pre-agreed 2-year fixed-rate extension option if the asset is needed for 7 years.

If the asset is likely required for 7 years, with just a small chance of being returned after 5 years (if, for example, there is an unexpected technology change), then the lease/buy decision should clearly give greater weight to the 7-year rather than the 5-year economics. A focus only on the initial lease term would tend to overstate the benefits of leasing.

Figure 4 shows how the NAL, risk transfer, and value to risk ratio vary with the likelihood that ABC Corp. will need the asset beyond year 5. Here, the value to risk ratio is less than 25%, provided the chance of ABC Corp. needing the asset beyond 5 years is less than 16%.

We have focused here on options under leasing. Ownership brings a different set of options — for example, to sell the asset at any time, to retain it for as long as required at low extra cost, freely to enhance or modify it, and freely to lease it out to others. The option under ownership to sell the asset at any point will tend to limit the switching benefits available under leasing (e.g., if new technology becomes available).

The ability to retain the asset for as long as required can also be very valuable. For example, the benefit of ownership would increase in the above example if there was a chance that the asset might be required for 10 years.

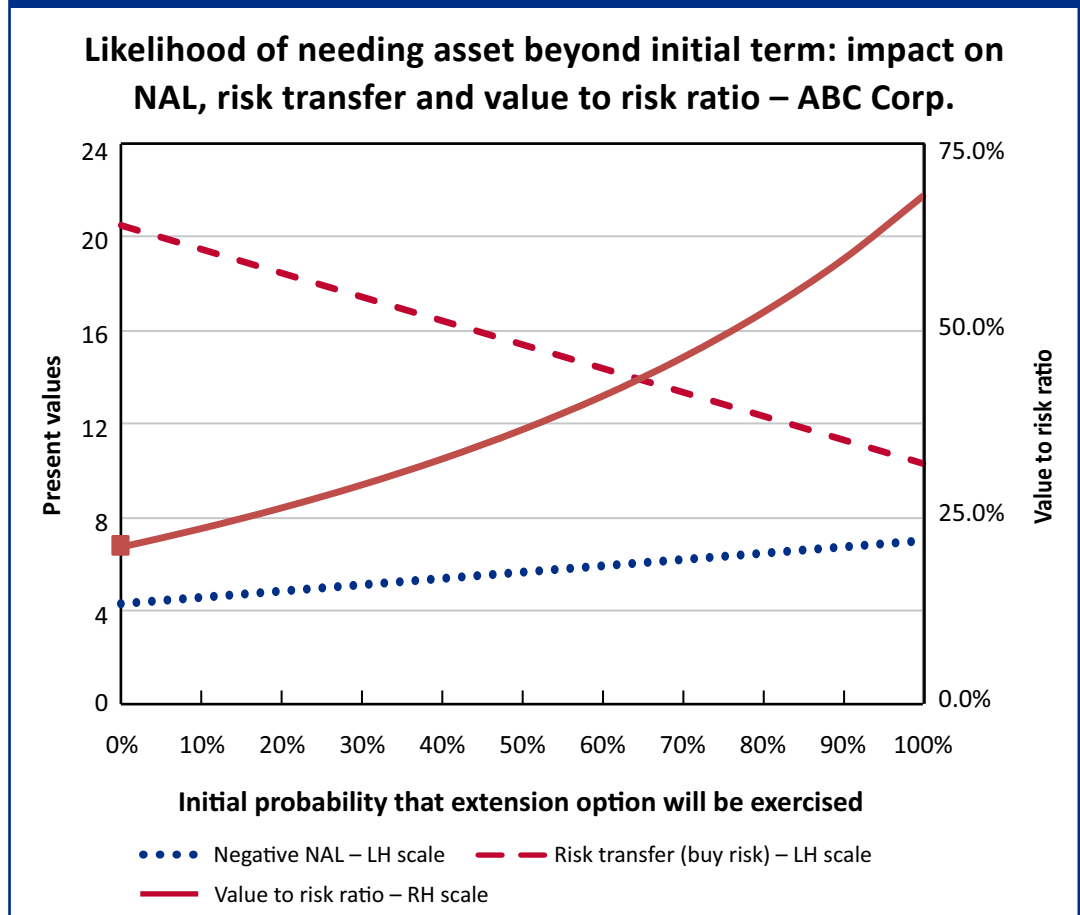
CONCLUSIONS

Lease/buy decisions for assets required for the medium to long term (e.g., for more than a quarter of the asset's useful life), and where the salvage risk under ownership is an issue, need to consider both the expected value outcome (NAL) and risk (the uncertainty or range of potential value outcomes), alongside other factors.

We have proposed a simple approach that potential lessees can use to quantify the risks of both ownership and lease options. The approach can also be applied to leases with renewal options. The range of value outcomes under ownership is usually greater than

Provided the assumptions underpinning the NAL calculation are reasonable, choosing to lease rather than buy is economically equivalent to receiving value equal to the NAL in return for reducing the risk (two-way variation in value outcomes) by an amount equal to the risk transfer.

Figure 4. Impact on Value to Risk Ratio of Likelihood of Needing Asset Beyond Initial Term



Source: Author’s calculations. Assumptions: For initial 5-year term, NAL = -4.3, risk transfer = 20.5; for 5-year term plus 2-year extension, NAL = -7.0, risk transfer = 10.3.

for a lease option, and this difference gives rise to risk transfer.

Provided the assumptions underpinning the NAL calculation are reasonable, choosing to lease rather than buy is economically equivalent to receiving value equal to the NAL in return for reducing the risk (two-way variation in value outcomes) by an amount equal to the risk transfer. We would therefore expect a risk-averse entity to be willing to bear a negative NAL in return for the risk transfer, provided the NAL is not too nega-

tive. Experience shows that stronger credits may also at times enter into value-negative leases. Entities can use the value to risk ratio (the negative NAL divided by the risk transfer) to make this value/risk trade-off and determine when the NAL becomes too negative relative to the risk transfer.

This decision will depend critically on the entity’s capacity to bear salvage risk, which in turn is affected by any correlation between the asset risks and the entity’s earnings. Where an entity

Table 10.

Typical Impacts of Key Factors on the Value to Risk Ratio

Value to risk ratio lower (lease more acceptable)	Factor	Value to risk ratio higher (lease less acceptable)
← Higher expected rv%	Expected residual market value (rv) as % of initial cost	→ Lower expected rv%
← Lower salvage value%	Achievable salvage value for entity under ownership, as % of residual market value	→ Higher salvage value%
← Shorter lease duration	Lease duration as % of asset life	→ Longer Lease duration
← Lower chance of renewal	Uncertainty how long the entity requires the asset for (e.g. chance of lease renewal)	→ Higher chance of renewal

Where an entity manages a portfolio of similar assets, there may be a stronger case for owning some of the longer term assets, as the salvage risk under ownership may be naturally hedged by the wider portfolio.

manages a portfolio of similar assets, there may be a stronger case for owning some of the longer term assets, as the salvage risk under ownership may be naturally hedged by the wider portfolio.

We have identified four factors that affect both the NAL and risk transfer and hence materially affect the value to risk ratio. Typical impacts are summarized in Table 10. In particular, leases of depreciating assets for the majority of their useful life will generally be hard to justify just by reference to risk transfer. Entities involved in multiple lease/buy decisions could use these factors, alongside their overall corporate finance policies, to develop frameworks to guide their decisions, rather than having to work on a case-by-case basis. ■

Acknowledgments

The author gratefully acknowledges the multiple interactions with BP colleagues and projects over many years and their influence on the ideas developed in this article. These ideas have evolved considerably since the author’s retirement, and the article is not intended to and should not be construed as representing BP’s approach to lease evaluation.

Endnotes

1. For example, such leases may prove attractive if the lessor can offer a lower overall effective borrowing rate than the entity’s normal debt, due to the lessor’s advantaged tax position. These types of lease/buy decisions typically compare the net present costs of two types of long-term financing that have similar accounting and risk outcomes.
2. “Quarter of useful life” is suggested as a rule of thumb as to when detailed lease/buy analysis is worthwhile.

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3. We are assuming that leases are noncancelable, offering a one-time protection against salvage value risk at the end of the lease term (and at the end of any pre-agreed extension options), in the form of the lessee's option to hand back the asset at that time: e.g., if it no longer requires the asset, or if a better leasing deal or better technology has become available. We will not consider leases where the lessee may share in any residual value upside and/or downside at the end of the lease (e.g., in the latter case, by way of a residual value guarantee).

4. However, the "1 in 20" approach described below for quantifying the risks under ownership can also be applied in situations where salvage value is not the only uncertainty, but where the lessor takes operating risks as well: for example, by dint of providing additional services such as maintenance or full operation of the asset.

5. Stewart Myers, David Dill, and Alberto Bautista, "Valuation of financial lease contracts," *Journal of Finance* 31: 799-819 (1976), as modified for situations where there is a salvage value under ownership. (See James Schallheim, *Lease or Buy: Principles for Sound Corporate Decision Making*, Boston: Harvard Business School Press, 1994, page 126.) The NPCs are calculated after tax using after-tax discount rates. Most cash flows are discounted at the entity's marginal after-tax cost of debt, except for the after-tax salvage value under ownership and any operating cost savings under leasing, which are discounted at a higher discount rate to reflect their riskiness. A simple approach is to use the entity's normal after-tax cost of capital as the discount rate for the after-tax salvage value. Schallheim (*Lease or Buy*, chapter 8) describes a more sophisticated approach of estimating asset betas and

using these to determine salvage value discount rates based on asset type.

6. This is a simplified approach that aims to minimize the use of probability distributions. Where the probability distributions of key unknowns (e.g., salvage value) and the correlations between them can be estimated, even if roughly, then Zeller, Stanko, and Tressler ("How Risky ...?") suggest using Monte Carlo analysis to estimate the distributions of the present value variations under ownership and leasing, thus providing additional insight for decision-makers.

7. This method can be applied asset by asset; entities with many assets could also determine salvage value risk weightings by asset class. Asset classes with volatile or illiquid secondary markets might be given a 100% risk weighting, so that in the severe downside case 100% of the estimated salvage value would be at risk. Asset classes where (for example) historical second-hand market lows are well in excess of half the estimated residual value might be assigned (say) a 40% risk weighting, so that the buy risk would be 40% of the worst-case figure.

8. It should normally be possible to make reasonable upper-bound estimates for contingent rentals, based on history and/or forecasts of the relevant rate factors. For extension rentals, where entities do not have access to sufficient rental or market history, the scale of the risk can be roughly estimated using simple approaches such as allowing forecast rentals or purchase option costs to increase by a certain percentage.

9. Other lessor advantages that could lead to a positive NAL include being better able to monetize the capital tax reliefs on the asset (e.g., for financial lessors such as banks); being able to secure a lower acquisition cost; and

for service leases exploiting synergies from combining ownership with maintenance or operation of the asset (e.g., for “industry lessors”). Gary Andrew and Dennis Gilstad, “A Generation of Bias Against Leasing,” *Journal of Equipment Lease Financing* 23(2):1-14 (2005), discuss such potential entity/lessor basis differences.

10. For example, the Government of Western Australia’s lease analysis guidelines (Lease Analysis Guidelines, Department of Treasury and Finance, Government of Western Australia, August 2005, previously available online) indicate that a cost premium of up to 5% of the capital cost of the equipment would generally be considered an acceptable cost to transfer residual/salvage risk from entity to lessor.

11. Where there are lease renewal options, the “loss” under ownership may include other factors such as failure to capture new technology benefits that might become available. We note that entities frequently choose to insure even though insurance usually has a negative net present value on a pure expected value basis.

12. So by leasing, both the downside (worst-case ownership downside versus worst-case lease downside) and the upside (best-case ownership upside versus best-case lease upside) are reduced by an amount equal to the risk transfer. It is irrelevant here to what extent the ownership and lease upsides or downsides are correlated with each other (although, as we shall see, the correlations of the upsides or downsides with the entity’s earnings *are* relevant).

13. So, for the entity, a simple lease is economically like a floating to fixed-rate swap on the after-tax salvage value, with the NAL representing the value cost of entering into the swap, and the

“fixed rate” being the entity’s expected after-tax salvage value.

14. Per expected utility theory (e.g., see Jean-Pierre Danthine and John Donaldson, *Intermediate Financial Theory*, 2nd ed., Cambridge, Mass.: Academic Press, 2014, chapter 4), a risk-averse entity would prefer leasing over ownership as long as the negative NAL does not exceed the “risk premium.” In this context, the risk premium is the excess of the present value of the expected after-tax salvage value over its “certainty equivalent,” which in turn is the lowest amount of immediate money-for-certain that the entity’s decision-maker would be willing to accept instead of the uncertain future after-tax salvage value, if it owned the asset. In practice, however, the risk premium is not easy to determine: it requires knowledge of the entity’s value utility function. We have adopted a simpler approach based on a “value to risk ratio,” which is also applicable in cases where both leasing and ownership carry economic risk.

15. For noncore assets, however, it may be less likely that a low salvage value will coincide with a downturn in the entity’s business, and so the downside protection may be less valuable.

16. Wenyuh Tsay, “Residual value risk in the lease-or-buy analysis,” *Journal of Academy of Business and Economics* 1(1):87-94 (2003), develops an example where the entity should purchase if earnings and residual value are negatively correlated, and otherwise should lease.

17. For example, if residual value and lease extension rates are both strongly positively correlated with the entity’s future earnings, we might assign multipliers of 0.8 to the buy risk, but only 0.2 to the lease risk, as high lease extension rates would be largely offset by higher entity earnings.

18. William Gibson, "Aircraft lessor prospects and lease valuation for airlines," *IATA Economics*, October 2008, www.iata.org/en/iata-repository/publications/economic-reports/aircraft-lessor-prospects-and-lease-valuation-for-airlines/, and Tevis Martin, "Common Sense ...," consider these issues for aircraft and test equipment respectively.

19. We are ignoring the normal termination of leases, as these do not typically create market exposure for the lessee.

20. These expand on some of the factors considered in Clifford Smith and Macdonald Wakeman, "Determinants of Corporate Leasing Policy," *Journal of Finance* 40(3):895-908 (1985).

21. ABC Corp. assumptions: ABC Corp. is a reasonable credit; book value depreciates on straight-line basis over 10-year asset life to nil; estimated residual market value equals book value; lessor assumed residual value risk in the lease equals 80% of estimated residual market value; ABC Corp. estimated salvage value is 90% of estimated residual market value; ABC Corp.'s tax rate is 30%; tax depreciation is the same as accounting depreciation; ABC Corp. can borrow at 5%; lease rentals are fixed and paid annually in arrears (so lease risk is zero); implicit interest rate in lease is 8%; ABC Corp. cost of capital is 9%; buy risk calculated using worst-case method.

22. An asset whose residual value has greater certainty should attract a lower lessor margin, if it is leased, and may also warrant a lower discount rate for the salvage value if it is owned, leading to lower net present costs of both ownership and leasing. The net impact on the NAL will depend on the individual circumstances of lessor and entity.

23. E.g., entities may be able directly to access relevant secondhand market

value data, or indirectly to estimate forward values/trends using data on the underlying factors that typically drive the relevant secondhand values. See Stephen Low, "Forecasting Residual Values," *Journal of Equipment Lease Financing* 2(3):18-25 (1984).

24. By analogy with the situation for loans of increasing durations.

25. For the worst-case method, the NAL and buy risk graphs cross at the lease duration for which the lease-versus-buy decision is value neutral assuming zero salvage value under ownership. This point will depend on factors such as market conditions (e.g., lessor margins), the nature of the asset, and any inherent lessor advantages.

26. The NAL may be positive if the entity is sufficiently disadvantaged in the secondhand market relative to the lessor, even for longer term leases, but the lease justification is then the positive NAL rather than the risk transfer.

27. Models have been developed to quantify the option value within leases, for example using variants of the Black-Scholes formula (see Schallheim, *Lease or Buy*, p. 168). These techniques, however, may ignore the option value under ownership, and as Gibson ("Aircraft Lessor Prospects ...,") suggests, can also result in a "black box" number, which may be difficult to interpret. For potential lessees, we believe an approach that looks at specific scenarios is not only easier to compute but is also much more insightful for decision-makers.

28. To calculate the "true" "1 in 20" downside risk where there are multiple scenarios would be complex and require estimating probability distributions for each scenario. The blend approach is quick, easy, and intuitive, offering an indicative "fit-for-purpose" method for determining the value to risk ratio in many of these types of situations.



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JOURNAL

OF EQUIPMENT LEASE FINANCING

VOLUME 38 • NUMBER 2 • SPRING 2020

The Pretoria Protocol for the Financing and Leasing of Mining, Agricultural and Construction Equipment Is Adopted

Adopted in November 2019, the Pretoria Protocol is expected to reduce the risk of finance, and increase access to financing, for sales and leases of mining, agricultural, and construction (MAC) equipment. However, much work lies ahead before the protocol can enter into force.

By Phillip L. Durham and Simon Stanley

The 2001 Cape Town Convention on International Interests in Mobile Equipment has four protocols that facilitate financing and leasing of aircraft, railway rolling stock, space assets, and now mining, agricultural, and construction (MAC) equipment.

The convention, which has already been heralded as the most economically significant international treaty of the 21st century, due to the success of its Aircraft Protocol,¹ becomes even more relevant with the adoption, on November 22, 2019, in Pretoria, South Africa, of the MAC Protocol (Pretoria Protocol).²

The purpose of the Pretoria Protocol is to provide a framework of uniform international law that protects security interests and title-retention rights in MAC equipment. An article in the Winter 2017

issue of this journal reported on the key features and economic and legal justifications for the Pretoria Protocol.³ This article follows up with updated economic impact estimates, details of the adopted text, prospects for future ratification, and an outline of work that remains to be done.

ADOPTION OF THE PRETORIA PROTOCOL

Work on the MAC Protocol began in 2005, initiated by the International Institute for the Unification of Private Law (UNIDROIT), and culminated in an intense and collaborative two weeks of negotiations at a diplomatic conference hosted by the Department of International Relations and Cooperation (DIRCO) in the Republic of South Africa.

Over 150 delegates from 43 states participated in the negotiations as well as one regional economic integration organization, three

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In particular, this newer protocol addresses states without modern secured transactions laws and where finance constraints have limited the supply of MAC equipment.

intergovernmental organizations, four international nongovernmental organizations, and one technical adviser.⁴ (For purposes of this article, *states* refers to the participating countries as UNIDROIT has referred to them.) The Republic of Congo, the Republic of Gambia, the Republic of Paraguay, and the Federal Republic of Nigeria all signed the protocol upon adoption.⁵

More than 20 states expressed confidence in the protocol's future impact on global economic development across the MAC sectors and indicated that their own internal process for signature consideration was underway.⁶ The MAC Protocol is now also referred to as the Pretoria Protocol in appreciation of the Republic of South Africa hosting the diplomatic conference.⁷

BENEFITS TO LENDERS AND BORROWERS

The Pretoria Protocol is modeled largely on the Aircraft Protocol, which is formally known as the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment.

This newer protocol is designed to reduce the risk of finance and increase its availability to increase financing, sales, and leasing of MAC equipment. In particular, it addresses states without modern secured transactions laws

and where finance constraints have limited the supply of MAC equipment. Suppliers and users of MAC equipment are both expected to benefit from increased supply, especially in developing economies.

Like its predecessors, the objective of the Pretoria Protocol is to provide certainty, predictability, and adequate protections of the rights of lessors and secured creditors to allow them to confidently lease and finance equipment across the world. The protocol will benefit secured creditors and lessors by providing predictable protection of their interests in MAC equipment, including during insolvency proceedings.

GLOBAL IMPACT

The global market for MAC equipment is valued at about \$200 billion annually.⁸ Among the 63 UNIDROIT member states, annual exports of MAC equipment exceed \$90 billion and imports total \$80 billion.⁹ The market for MAC equipment is diverse. Thousands of companies, large and small, manufacture MAC equipment,¹⁰ and the scope of the protocol includes secondhand equipment in the substantial secondary market.¹¹

Moreover, MAC equipment is essential to developing economies for exploitation of natural resources, construction of physical infrastructure, and expansion and intensification of agriculture, a key sector for GDP, employment, and

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A 2018 assessment of the economic impact of the MAC Protocol in the 63 UNIDROIT member states estimates that over a 10-year period, the protocol may increase the stock of MAC equipment in developing economies by \$90 billion.

food security. In economies with less access to credit, insufficient capital equipment constrains productivity, profits, and economic growth.¹²

The Pretoria Protocol has the potential to make an even bigger impact than the Aircraft Protocol that inspired its vision. A 2018 assessment of the economic impact of the MAC Protocol in the 63 UNIDROIT member states estimates that over a 10-year period, the protocol may increase the stock of MAC equipment in developing economies by \$90 billion.¹³

The assessment predicts that the MAC Protocol will increase GDP by \$23 billion in developing economies and by \$7 billion in developed economies, impacting GDP globally by \$30 billion annually.¹⁴ The impact could be even larger considering that ratification of the Pretoria Protocol is not limited to the 63 UNIDROIT members included in the assessment, and 80 states have ratified the Cape Town Convention.

WHAT IS MAC EQUIPMENT?

The scope of MAC equipment covered by the Pretoria Protocol is limited to equipment corresponding to 56 six-digit codes selected from the 2017 edition of the World Customs Organization Harmonized Commodity Description and Coding System (Harmonized System, or HS).¹⁵

The 56 HS codes selected for the Pretoria Protocol are contained in three annexes designed to allow a contracting state¹⁶ to exclude equipment used predominantly in one or two of the MAC sectors. Annex 1 contains mining equipment, Annex 2 contains agricultural equipment, and Annex 3 contains construction equipment.

A contracting state may not exclude only some of the codes in an annex but may limit the application of the protocol to equipment of only one or two annexes.¹⁷ The protocol applies to all equipment included in any annex for which the protocol is effective. Any intended or actual use of the equipment is irrelevant.¹⁸

For example, even for a contracting state that has excluded Annex 1 (mining equipment) and Annex 3 (construction equipment), because HS 842911 appears in all three annexes, a track-laying bulldozer falls within the scope of the protocol, whether it is used for mining, agriculture, construction, or any other purpose.

The World Customs Organization revises the HS codes every five to six years, most recently in 2017.¹⁹ The Pretoria Protocol includes provisions for adjustments to the annexes to maintain conformity with the Harmonized System as well as provisions to modify the annexes, including the potential addition of new HS codes, including the potential addition of new HS codes to expand its scope.²⁰

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Contracting states agree to ensure that the relevant administrative authorities expeditiously cooperate with and assist the creditor to the extent necessary, subject to any applicable safety laws and regulations.

The 56 HS codes included within the scope of the protocol were selected from codes proposed for consideration by UNIDROIT member states and industrial organizations. In 2017, following a five-year evaluation process, UNIDROIT's Committee of Governmental Experts approved 42 HS codes (out of 113), constituting \$109 billion in annual exports, for inclusion in the draft protocol.²¹

Subsequently, 71 proposals were made by six states regarding 42 additional HS codes. Of these, 14 were recommended for inclusion in the draft protocol.²² Additionally, one HS code was recommended for removal.²³ During negotiations at the diplomatic conference, all of the above recommendations were accepted, and one additional HS code was added to the annexes from proposals submitted for the diplomatic conference.²⁴

A PROTÉGÉ OF THE AIRCRAFT PROTOCOL TAILORED FOR THE MAC SECTORS

In the hope of duplicating its success, the Pretoria Protocol draws heavily on the Aircraft Protocol. With the goal of creating an easily ratifiable treaty, the Pretoria Protocol offers contracting states simple binary choices between retaining their local law or adopting provisions designed to produce the economic benefits demonstrated by the Aircraft Protocol.

For example, the Pretoria Protocol offers the insolvency provisions of the Aircraft Protocol that have been widely favored by ratifying states and thought to produce the most certainty and economic benefit.²⁵

Likewise, similar to the Aircraft Protocol's provisions for the secured creditor to de-register and export aircraft,²⁶ the Pretoria Protocol provides for the secured creditor to export MAC equipment from the contracting state in which it is situated.²⁷

Moreover, contracting states agree to ensure that the relevant administrative authorities expeditiously cooperate with and assist the creditor to the extent necessary, subject to any applicable safety laws and regulations.²⁸

Equipment Associated With Immovable Property

One issue addressed by the Pretoria Protocol that did not arise for the aircraft, space,²⁹ or rail protocols, is the association of equipment with immovable property, such as land. National legal regimes vary on their approach to extending immovable property rights to movable property. For example, when irrigation equipment is installed at a farm it may be considered a fixture, the rights to which run with the land.³⁰

This issue is further complicated by the question of whether such equipment's association with the land has caused the equipment to

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A second issue addressed by the Pretoria Protocol that does not arise under the previous protocols is the treatment of equipment held as inventory by a dealer.

lose its identity as property that is separable from the land. To provide certainty for creditors, while remaining flexible in the interests of contracting states, the MAC Protocol offers three alternatives regarding the treatment of MAC equipment associated with immovable property.³¹

Alternative A is expected to be selected by most states. It provides an objective test to determine whether MAC equipment is separable from immovable property. If it is separable, application of the protocol is unaffected. To be separable, the estimated value of the equipment after physical disconnection from the immovable property must be greater than the estimated cost of disconnecting the equipment and restoring any damage to the immovable property.³²

Furthermore, there is a rebuttable presumption that if immovable-associated equipment is severable from the immovable property at the time it became associated, or when an international interest in the equipment was created, whichever is later, the equipment continues to be severable.³³ Therefore, an evaluation conducted at the time of financing need not be repeated at a later date unless rebutted.

Alternative B applies national law to determine separability but gives priority to an international interest

unless two conditions existed before the international interest was registered: (1) the competing interest had been registered in accordance with domestic law, and (2) the equipment had become associated with the immovable property.

Alternative C simply applies the national law to determine the effects of association of the equipment with immovable property in relation to an international interest.

Equipment Held as Inventory

A second issue addressed by the Pretoria Protocol that does not arise under the previous protocols is the treatment of equipment held as inventory by a dealer. The International Registry is an asset-based system, with registrations by equipment serial number rather than debtor name. As such, it is not possible to register an interest over, for example, all of a dealer's equipment, as is commonly done in debtor-based filing systems in the United States or Canada.³⁴

Rather than requiring registration of international interests in each individual object held in inventory, which a dealer may hold for only short periods, the Pretoria Protocol provides contracting states with the option of excluding an interest in inventory from constituting an international interest.³⁵ This option may be attractive for states with established inventory financing

Adoption of the protocol does not bind the negotiating states to its provisions.

Two additional steps are required before the Pretoria Protocol can enter into force as binding international law for the contracting states that ratify or accede to the protocol.

regimes that include debtor-based filing systems where security interests in inventory may be registered more efficiently by asset category or general description.

For purposes of this provision, the location of a dealer's inventory is irrelevant.³⁶ An international interest in inventory cannot be created if the dealer is the debtor and is located in a contracting state that has decided to apply this provision.³⁷

NEXT STEPS FOR IMPLEMENTATION OF THE PRETORIA PROTOCOL

Adoption of the protocol does not bind the negotiating states to its provisions.³⁸ Two additional steps are required before the Pretoria Protocol can enter into force as binding international law for the contracting states that ratify or accede to the protocol: (1) five states must ratify the protocol, and (2) an International Registry must be fully operational.³⁹ Four states signed the protocol upon adoption, and many others indicated that they were moving forward with the internal processes necessary before signing.

The International Registry for MAC equipment is expected to be similar to the existing International Registry for Aircraft in that it will be globally available, via the internet, for electronic searches and registrations.⁴⁰

The diplomatic conference resolved to establish a preparatory commission that would act as provisional supervisory authority, under the guidance and supervision of UNIDROIT, to establish the International Registry under the Pretoria Protocol.⁴¹

The commission will meet on May 21 and 22, 2020, and will consist of up to 20 representatives appointed by UNIDROIT from nominations by states or from regional economic integration organizations that have signed, ratified, or acceded to the protocol, as well as by up to seven states that participated in the conference and up to seven states nominated by UNIDROIT.⁴² Other organizations, including the MAC Working Group, will participate as observers to the meetings.⁴³

Due to the COVID-19 pandemic, the first meeting will be a virtual meeting. The impact of the pandemic also casts uncertainty over the expected speed of ratification of the protocol. With a view to guaranteeing that the International Registry is operational by the time the protocol enters into force, the preparatory commission's goal is to ensure that all necessary regulations and procedures are prepared and approved within two years of its first meeting.⁴⁴

As provisional supervisory authority, the commission will ensure that the registrar managing the International Registry is

selected in accordance with an objective, transparent, and fair selection process.⁴⁵ Pursuant to Article XIV(1) of the protocol, the diplomatic conference resolved to invite the International Finance Corporation to accept the functions of supervisory authority when the protocol enters into force. If the IFC does not accept this invitation, the conference will invite the preparatory commission to consider appointing another international organization or entity.⁴⁶ ■

Endnotes

1. Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment (Aircraft Protocol).
2. Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Mining, Agricultural and Construction Equipment (MAC Protocol or Pretoria Protocol).
3. See Phillip Durham and Marek Dubovec, “More Good News From Cape Town: How the New MAC Protocol Will Benefit the Mining, Agriculture and Construction Industries,” *Journal of Equipment Lease Financing* 35:1 (2017).
4. The MAC Protocol is Adopted! (UNIDROIT 2019), <https://www.unidroit.org/89-news-and-events/2772-the-mac-protocol-is-adopted>.
5. *Ibid.*
6. *Ibid.*
7. *Ibid.*
8. MAC Protocol Economic Assessment, paras 73, 75 (Warwick Economics and Associates, August 2018), <https://www.unidroit.org/english/documents/2018/study72k/1808-final-mac-protocol-ea.pdf>.
9. *Ibid.*, para. 75.
10. *Ibid.*, para. 81.
11. *Ibid.*, para. 102.
12. *Ibid.*, para. 16.
13. *Ibid.*, para. 204.
14. *Ibid.*, para. 204.
15. The Harmonized System comprises about 5000 six-digit codes that cover 98% of international trade and has been adopted by over 200 economies to categorize commodities traded in international commerce. See What is the Harmonized System (HS), World Customs Organization, <http://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized-system.aspx>.
16. A contracting state is a state that has consented to be bound by the protocol. See Vienna Convention on the Law of Treaties (1969), art. 2(f).
17. Pretoria Protocol, art. II(2).
18. *Ibid.*, art. II(1).
19. See “What is the Harmonized System (HS)?” *supra* note 15; and see <http://www.wcoomd.org/en/topics/nomenclature/overview/hs-multi-purposes-tool.aspx>.
20. See Pretoria Protocol, arts. XXXV, XXXVI.
21. The Harmonized System Codes Proposed for Inclusion in the MAC Protocol Annexes, paras. 5-6, app. 1, (UNIDROIT, July 2019), <https://www.unidroit.org/english/documents/2019/study72k/dc/s-72k-dc-06-e.pdf>.
22. Report of the Working Group on HS Codes to the Commission of the Whole, para. 7, (UNIDROIT Nov. 16, 2019), <https://macprotocol.info/wp-content/uploads/2019/11/DCME-MAC-Doc.-20-Report-of-the-HS-Working-Group-1.pdf>.
23. *Ibid.*
24. *Ibid.*, paras. 10, 12(e).

25. Pretoria Protocol, art. X includes the same provisions as Aircraft Protocol art. XI, Alternative A.
26. Aircraft Protocol, art. IX.
27. Pretoria Protocol, art. VIII.
28. Ibid., art. VIII(5).
29. The Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Space Assets (Space Protocol) was adopted by a diplomatic conference in Berlin, Federal Republic of Germany, on March 9, 2012. As of April 29, 2020, no state had ratified the Space Protocol. For entry into force, Article XXXVIII requires that 10 states ratify, accept, approve or accede to the protocol. See Status – UNIDROIT Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets (Berlin, 2012), UNIDROIT, <https://www.unidroit.org/status-2012-space>.
30. For an in-depth discussion of this topic, see generally, Benjamin von Bodungen and Charles Mooney, “Immovable-Associated Equipment under the Draft Mac Protocol: A Sui Generis Challenge for the Cape Town Convention,” *Cape Town Convention Journal* 6:37 (2017).
31. See Pretoria Protocol, art. VII.
32. Ibid., art. VII(4).
33. Ibid., art. VII(5).
34. Such as the Uniform Commercial Code collateral registries of each state.
35. See Pretoria Protocol, art. XII(2).
36. See *ibid.*, art. XII(2).
37. See *ibid.*, art. XII(2).
38. Negotiating states are states that took part in the drawing up and adoption of the text of the protocol. See Vienna Convention on the Law of Treaties (1969), art. 2(e).
39. Pretoria Protocol, art. XXV.
40. See, e.g., International Registry, <https://www.internationalregistry.aero/ir-web/>.
41. Resolution 1 of the diplomatic conference.
42. *Ibid.*
43. *Ibid.*; The MAC Working Group [MAC WG] was formed by UNIDROIT in 2015 to provide an avenue for MAC equipment industries to contribute to the MAC Protocol project. The MAC WG member companies and organizations represent the interests of more than 10,000 companies doing business on six continents. See <https://www.macwg.org/members>. Other organizations invited to participate as observers include the International Registries of the other protocols, World Customs Organization, World Bank Group, and the Kozolchyk National Law Center (NatLaw).
44. Resolution 1 of the diplomatic conference.
45. *Ibid.*
46. Resolution 2 of the diplomatic conference.



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JOURNAL

OF EQUIPMENT LEASE FINANCING

VOLUME 38 • NUMBER 2 • SPRING 2020

Innovation: Evolution or Revolution?

What constitutes innovation in our industry? What has stopped organizations from innovating? Is now the time to innovate? Business first or customer first? Does innovation need to be evolutionary or revolutionary? These are the questions a group of finance and technology experts recently convened to explore.

By Katie Emmel

In March 2020, a group of equipment finance professionals gathered in Naples, Florida, after the Equipment Leasing and Finance Association (ELFA) Executive Roundtable, to discuss innovation in our industry.¹ This meeting of the Technology Innovation Leadership Series is an ongoing exploration of how technology can and will impact equipment finance.

This group included a blend of finance companies, technology vendors, an industry consultant and ELFA leadership. They explored a series of basic topics related to innovation, starting with the Foundation's question, What is innovation? There have been ongoing industry discussions on the need to innovate to remain an integral part of the global economy. The question remains: What has stopped some leasing organizations from moving in this direction?

Digital signature has been frequently discussed as innovative technology, but is that really innovation? The technology innovation group did not think so. The technology to support digital signatures has been available for well over a decade, yet many businesses have not incorporated this in their standard business practices.

The group explored barriers to innovation, what constitutes revolutionary innovation versus evolutionary innovation, and what it will take to move from discussions like these to action.

One core approach to answering these questions was to look at how to disrupt our industry in order to drive innovation and the adoption of technology. There were discussions of conducting a "kill your own business"² exercise or a "hackathon"³ to spur innovation. This was an attempt to identify ways to disrupt business before someone or something forces disruption upon us.

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As we sit here just a few months later, the idea of trying to force disruption has faded as we face the greatest business disruption to the global economy in the form of the COVID-19 virus.

Since the onset of the pandemic, businesses have moved to a work-from-home model that has changed the way we interact and the way we provide services to our customers. Video calls have become the new normal, providing a window into colleagues' personal lives. This is not a test, this is not a business continuity plan drill: this is true disruption. Innovation is the path forward, which is providing the ability to continue to operate in this new environment of unprecedented change.

With the COVID-19 disruption, technologies like digital signature are gaining adoption due to the new landscape of employees and customers working remotely. Disruption is forcing change, imposing the acceleration of technology adoption and a new way of thinking about how we do business.

IS NOW THE TIME TO INNOVATE?

Being deliberate about setting aside resources to focus on innovation is difficult for even the most forward-looking organizations. We live in a world of capital expenditures requiring a defined return, with as much risk removed from the equation as possible. With innovation, there is inherent risk

that what you invest in today may not be right for where the market goes in the future.

The risk of innovation is a risk we must take as an industry. The group of leaders who gathered in March all felt that it was important to set aside budget to innovate.

But what is innovation for our industry? Is it finally getting to digital signature and removing the paper requirement for a transaction? Is this the type of innovation we are talking about? Or is it something more? In our discussion, many ideas were put forth on innovations that would advance the industry. To try to best represent the thoughts of the group, we break this down into two categories: business model innovation and technology innovation.

BUSINESS-MODEL INNOVATION

We are all familiar with the changes companies like Uber have had on the taxicab industry or Airbnb to the hotel industry. These companies took an established marketplace and looked at the problem through a different lens. Uber removed the challenge of hailing and paying for a taxi, and Airbnb provided reasonable accommodation for those not wanting to pay the premium of a hotel.

What seems obvious now was a problem statement that needed a new answer. Both of these

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Leasing companies have an opportunity to look differently at their business models, in their effort to deliver the best possible customer experience – which also likely leads to market share gains.

examples focus on customers and their experience. Customer experience will become increasingly important to equipment finance. Customers are being conditioned to expect a frictionless process as they interact with any business.

As we see a new generation of consumers emerge, a digital consumption-based experience will become the norm. The COVID-19 crisis has magnified the need for and in many cases exposed the lack of digital customer experience.

To achieve business model innovation, we have to think big. This was a common theme in the discussion of how to move innovation forward. For example, the group exercise of using a blank sheet of paper to build out an application helped one company to reimagine the finance process. The process focused on removing constraints associated with current business models and enabled them to remove the mindset barriers that might interfere with a new approach to an existing pain point.

Thinking big does not come without risk. In this time of extraordinary change, however, leasing companies have an opportunity to look differently at their business models, in their effort to deliver the best possible customer experience — which also likely leads to market share gains.

Part of this discussion focused on the question of “business first

or customer first?” Our instinct and business training tell us that we should put customers first. But what we see in practice is an attempt to mold business-first processes into a customer-first application.

These two approaches are not mutually exclusive. We need solid business processes in place to ensure the fundamentals of the finance operation are sound, but we need to do this with the customer as the focal point of the process build-out.

Each interaction point with the company’s customers and partners needs to be evaluated, and each step of the financing process needs to be reviewed with the mindset of how each step impacts the overall customer experience.

At the heart of business-model innovation is the ability to create new business opportunities. However, the key question we pose in this article is, Does innovation need to be evolutionary or revolutionary? We will explore this in greater detail in the Technology Innovation section, because it is an important question as we look at business-model disruption.

Today, many businesses have had to evolve due to work-from-home mandates. In many cases, technology had already been deployed, though not fully embraced. Those who had migrated key business processes and applications to the cloud were better positioned to

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Are the steps your company's users must take to accomplish a task both easy to understand and easy to navigate? Are the processes well laid out, allowing the user to complete the transaction in as few steps as possible?

quickly adjust to this new remote working model. Others, however, lost time in having to quickly figure out how to remain operational without staff going into the office. However, this is evolutionary, not revolutionary.

Revolutionary is where we will see the biggest leaps forward in our industry. We are already facing incredible disruption. Now is the time to break down the assumptions of the past and look for new ways to deliver better customer value — which in the end will provide a better overall return.

TECHNOLOGY INNOVATION

When we talk about innovation, the conversation naturally gravitates toward technology. This is where we see the most tangible forms of innovation. It was not that long ago that the thought of a person's cellphone being a primary source for all forms of entertainment and business would have been considered impossible. As Apple and others have paved the way, the phone is now the central hub for so much of life — like it or not.

The reality is that technology is changing the way we live and interact, which in turn is creating an expectation for the customers and partners we serve. With much of life accessible through mobile technology, customers are accustomed to and increasingly expecting

frictionless experiences in both business and personal interactions.

As we stated above, it is important to look at each customer interaction point to identify the opportunities for innovation. Thinking through this from a technology perspective, this means walking through user interaction points experienced through the user interface. Are the steps your company's users must take to accomplish a task both easy to understand and easy to navigate? Are the processes well laid out, allowing the user to complete the transaction in as few steps as possible?

Although it is important to ask these questions and go through the exercise to see if it makes sense for your company, the best test of this is to bring in someone who is a digital native (i.e., a person born or brought up during the age of digital technology) and ask that person to walk through the process your company has established. This experiment will most likely challenge your assumptions and provide insight into how to improve your company's overall customer experience.

The world is rapidly changing and evolving. The idea of a global disruption to our economy is no longer theoretical. It is real. It can and has happened. The key for equipment finance and for the financial world as a whole will be our ability to respond to this disruption.

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We kept touching on the new reality of customer expectations that technology is not something you do — technology “just is.” This concept has the potential to be revolutionary if we embrace it at its core.

Do we evolve to simply ensure business as usual even when working remotely? Or does this trigger a bigger response? Does this spark revolutionary thinking in how we approach equipment finance? What are the assumptions we are holding onto that hold us back from making a significant change to how we do business?

As we discussed these questions in the group, we kept touching on the new reality of customer expectations that technology is not something you do — technology “just is.” This concept has the potential to be revolutionary if we embrace it at its core.

If we approach technology as being fundamental to customer interactions, it will spark change across the industry. For example, when we talk about credit, is the only answer to assessing risk based on a number issued by one of the credit-reporting agencies? Are there other ways to establish creditworthiness? And here is the most challenging question: Can artificial intelligence (AI) provide better risk assessment than classic human underwriting?

In his recent book *Talking to Strangers*, Malcom Gladwell digs into this topic of AI by citing a study conducted by economist Senhil Mullainathan of 554,689 bail hearings held in New York City between 2008 and 2013. The research team discovered that almost 50% of

those released on bail either did not appear for their court date or were arrested for a subsequent crime.

The team applied machine learning to the raw data available to the judges who granted bail, with the result that the AI program made better bail decisions. Had AI been applied, it would have resulted in 25% less crime. If we were to apply this to credit-decisioning, how would it affect how we determine creditworthiness?

Machine learning is only one process to be considered, but it points to the potential for new ways of thinking, which in turn could open new avenues of opportunity for equipment finance.

WHAT CONCEPTS SHOULD WE BE CONSIDERING?

In our discussion, the topic of innovation was viewed from different vantage points. With representation from both finance companies and technology providers, the group addressed several concepts that are worth a brief discussion. This discussion included “next steps” in trying to determine how to move forward.

The Role of Data

Information is the foundation of our industry. We need to know specific details on each asset financed. We need to know the person or entity financing the asset. We need to establish term and payments.

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Any asset that has some time- or usage-based element has the potential to be financed based upon that unit of measurement. This cuts across sectors and asset classes and provides an option for a more flexible financing option.

Data is how we make our decisions and drive our business. However, as more data becomes available, are we leveraging this data to its full potential? As in the credit-decisioning example, the use of data can be a powerful tool and can open new opportunities for equipment finance organizations. What are the similarities between prospects and customers? Can AI provide enough transparency in look-alike referrals to exponentially increase opportunity?

A good example of putting data to work is usage billing. This is a concept that has been embraced by office imaging companies for decades. It allowed them to innovate their business model to bundle in consumables and service offerings into their per image fee structure.

As our world becomes more connected through the internet of things (IoT), we have access to more data than ever before. This is where we need to ensure we are thinking about innovation both from a business model perspective and supporting technology. Any asset that has some time- or usage-based element has the potential to be financed based upon that unit of measurement. This cuts across sectors and asset classes and provides an option for a more flexible financing option.

There is a key dependency for leveraging data – one has to be able to track and account for it at a system level.

The New Secret Sauce

One of the concepts that is becoming more prevalent in equipment finance is the interconnectivity of systems. Gone are the days of standalone proprietary systems. Over the course of the last decade, there has been a growing open-source movement, which allows for systems to talk to one another — royalty free, typically — until a commercial threshold is crossed or premium features are required.

This model and associated web services/API (application programming interface) based concepts have pushed technology vendors to provide connectivity into other applications with a goal of providing a great overall experience for end users.

Salesforce.com was one of the early pioneers of this concept through its AppExchange. This allowed Salesforce.com to focus on the platform while other specialty companies could focus on providing additional functionality to the platform.

Organizations have benefited from this approach, which enables them to improve overall customer experience with applications built on Salesforce.com's platform tailored to meet their specific needs. This integrated approach and system-level thinking has removed manual steps across disparate systems to create a seamless experience for the end user.

The connectivity concept is finding its way into the equipment finance

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Although strides have been made in providing aligned functionality, the equipment finance industry lags in the adoption of cloud-based solutions.

industry. With finance companies looking for more integrated systems and technology providers moving to new delivery methods including cloud and mobile, the ability for the industry to make a significant leap forward is close at hand.

Systems need to talk to one another to provide a frictionless experience for the borrower. For example, your origination solution should be able to connect with credit-reporting services, access appropriate tax rates by geography, and calculate insurance, allowing the process to move quickly and automatically if application thresholds are met.

We should be looking to reduce the number of manual steps in any process to become as efficient as possible. However, this is not solely a technology issue. This is a business issue that requires moving outside of traditional thinking.

We need to look beyond incrementally improving what is already in place and refine business processes to provide a customer-centric application. As an industry we need to think in terms of ecosystem and how to ensure that all of the supporting technology to our processes work together.

TECHNOLOGY'S NEW HOME

Technology has underpinned equipment finance from the beginning. Finance companies have leveraged

technology tools to manage the life-cycle of a contract. These technology tools have made significant strides in providing real-time data and analytics to help understand the status of a portfolio.

Although strides have been made in providing aligned functionality, the equipment finance industry lags in the adoption of cloud-based solutions. Given the sensitive information associated with financing, the slowness to adopt this delivery mechanism is understandable.

The reality is technology has a new address. It no longer lives in a data center: it lives in the cloud. This may not be true for your organization today, but it should be something you are strongly considering.

Historically, companies built data centers to provide a world-class computing backbone for the applications to support their equipment finance business. In some cases, in-house data centers were thought to handle increasing volumes and potentially achieve a competitive advantage.

Today, organizations realize that data centers are more of a financial burden of heavy IT costs coupled with a never-ending race to keep pace with computing needs and changes. They do not help businesses grow and are often a barrier. Industrial cloud providers like Amazon and Microsoft provide the scale needed to handle any application, due to their ability to work

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These subgroups also provide the ability to attract emerging talent into our industry, in the form of people who look at the world from a different vantage point, embracing innovations found in customer engagement arenas like fintech.

across geographies and quickly failover to a backup data center if something were to happen to the primary site.

The need has never been more apparent to disassociate what an application provides to the user from its physical location. As the pandemic hit and companies around the world asked their employees to work from home, those with cloud-based applications were able to quickly move to remote operation without disruption. There was no need to have IT on site to maintain application integrity. Remote workers could connect like they do in the office and continue to perform their daily responsibilities.

Many companies are changing the way they account for cloud enhancements. Previously, when a company would purchase or lease a piece of equipment, there would also be a maintenance contract fee applied to the equipment that would cover service and upgrades.

In the new cloud-based environment, a company pays for the processing power that it uses, which could have parity with, or be less than, what just the service fee would be. As we move forward, the cloud will continue to provide the advantage of economies of scale, which will drive down the cost of IT and further push application management into the technology vendor community.

TAPPING INTO PURPOSE

To this point our discussion has focused on tools or processes that can be implemented to help achieve innovation. Yet innovation extends to all aspects of equipment finance. We have seen actions within our industry and in ELFA in particular to embrace diversity and to push for inclusion of new participants within our ranks.

Within this group, many have supported ELFA's Women in Leasing and the new Equality Steering Committee, which bring fresh ideas and new perspectives to equipment finance. These subgroups provide an opportunity for emerging industry leaders to bring new perspectives, with the freedom to think beyond traditional boundaries.

These subgroups also provide the ability to attract emerging talent into our industry, in the form of people who look at the world from a different vantage point, embracing innovations found in customer engagement arenas like fintech.

A growing number of people want to work someplace that is having a positive impact in the world. This may manifest itself in creating a positive work environment, but it is more targeted to the outcome of the individuals' work. Are they helping to start or grow a business through their company's financing function?

In short, to this group of emerging leaders, the *why* of what we do

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We are a piece of a much larger global puzzle. However, if we start from the foundation of the why of what we do, we believe it will give us the opportunity to attract diverse and emerging talent.

is just as important as *what* we do, and purpose becomes central to their individual motivation for work. This is a tangible outcome that taps into purpose and keeps employees engaged.

Our technology innovation group believes that what our industry does is foundational to the economy. We provide access to financing that empowers the economic engine of our country and beyond. Small businesses would not be able to start if they did not have access to financing, and it is our industry, in its different flavors (type of financing institution and size), that enables this economic growth.

As the world will need time to recover from the impact of the global pandemic, we have a unique opportunity to tap into this message and overall purpose of helping restart the economy. This means looking at the world through a different lens, engaging in new thinking to turn our attention to focus on the health and well-being of people.

For example, supply chain and new asset classes focused on sanitization or health screening will most likely have a tailwind coming out of the crisis. Are we taking the time to look at the whole picture and the impact we can have as an industry?

Let us challenge our thinking on how we pull this thought process of purpose through the businesses we finance and the causes they

support. We are a piece of a much larger global puzzle. However, if we start from the foundation of the *why* of what we do, we believe it will give us the opportunity to attract diverse and emerging talent, which will further push our thinking on innovation and how we grow and adapt our industry.

EVOLUTION OR REVOLUTION?

The question remains: What is the best way for the equipment finance industry to access true innovation? Will we gradually evolve as business environment elements change and require a response? Or will we experience a revolution triggered by individual company choices or market variables that force this upon us? There is not one answer that is sufficient to cover our industry. If we look to history, those who lean into innovation are the ones that create opportunity for their companies.

There are also plenty of examples of innovations that were dismissed or discounted and that ultimately became a company's downfall. Think of how Kodak could have continued to be a dominant player in the photo industry had it only embraced digital photography, which was invented in its own laboratories, or how Microsoft was able to return to relevance as it pivoted to embrace the emergence of the internet, and how it continues to innovate with collaboration and cloud-based technology.

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We need to be open to embracing new ideas and looking outside of our industry to see how innovation is impacting other aspects of finance and banking.

The challenge for us is that we need to be looking at our own organizations and our industry as a whole to see where we could push innovation forward. This starts with the willingness to challenge our assumptions and unconscious biases that limit us from tapping into the business model and technology innovation that is around us.

We need to be open to embracing new ideas and looking outside of our industry to see how innovation is impacting other aspects of finance and banking. This would enable us to see what can be pulled into our industry to drive better customer experience and increase the overall efficiency of our operations.

We will not get there in one big push toward an innovation

initiative. However, if we start with a willingness to innovate and embrace new ideas, we will begin to see real impact. It will change the way we help drive global economic recovery growth. ■

ENDNOTES

1. The Technology Innovation Leadership Series meeting on March 10, 2020, included the following: Bill Choi, ELFA; Katie Emmel, IDS|Asset Finance Technology; Randy Haug, LTi Technology Solutions; Joe Leonard, Oakmont Capital Services; Dan Nelson, Tamarack Consulting; Ralph Petta, ELFA; Deb Rueben, TomorrowZone; Hugh Swandel, Meridian OneCap Credit Group; Scott Thacker, Ivory Consulting Corp.; and Bill Verhelle, Innovation Finance.

2. <https://hbr.org/2012/10/kill-your-business-model-befor.html>.

3. <https://en.wikipedia.org/wiki/Hackathon>.



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As chief operating officer, Katie Emmel is responsible for IDS global product management, professional services and support with focus on customer success. With more than 30 years of experience at IDS, she is a proven leader and instrumental member of the IDS executive team. Prior to her appointment as COO, Ms. Emmel was senior vice president of product management and held several key positions at IDS. She serves on the Foundation's board of trustees and on its Research and Development Committee, and recently served on ELFA's Operations and Technology Committee. Ms. Emmel's career began as a software engineer with IDS and she thus was part of growing the company from a startup to its position today in the equipment finance industry. She holds a computer science degree from the Alexandria (Minnesota) Technical College. IDS is headquartered in Minneapolis, Minnesota.

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