

There is high demand from airlines for engine sale & leasebacks. Engines retain their resale values and have higher lease rate factors than aircraft. This makes it possible for engine lessors to make large cash returns. There are, however, many possible pitfalls, which require specialised skills to avoid.

The profit potential of engine sale & leaseback transactions

While some may take the view that sale and leasebacks are a way for lessors to act as airlines' bankers, they can generate good cash returns, especially in the case of engines. The rationale behind engine sale and leasebacks is to remove asset risk and provide liquidity for airlines. From the lessor's point of view they are transactions with good residual value risks.

Principles of transaction

Engine sale and leaseback transactions can be low risk, but require a willingness for equity investment and debt provision, as well as a high level of technical expertise for asset management. These represent high barriers to entry and leave the market to a few specialists.

"Banks do not take direct asset risk on engines, and prefer to have a specialist lessor in the middle," explains Jon Sharp, chief executive at Engine Lease Finance (ELF). "Engines are specialised assets and require particular technical, marketing and legal management. A critical mass is also required to make engine leasing economic, since these management skills incur large overheads. A minimum portfolio of 50 engines is probably necessary."

Roger Welaratne, senior vice president of operations at Shannon Engine Support (SES) continues: "Banks prefer to focus on lending money with high security. In the event of a lessee becoming bankrupt, the lease then becomes a case of remarketing. A bank would not relish this prospect, whereas an engine lessor will have less of an issue."

The two principal cash generating flows of engine sale and leaseback transactions are resales and rentals.

Most engine lease transactions are in

the range of 3-7 years, and engine resale values are often 80% of purchase cost, which is high compared to aircraft. While many engine lessors refinance engines at the end of transactions, the resale or market value at the end of a lease generates strong cashflow. A modern engine type, such as a CFM56 or V.2500 bought for \$5 million can have a value of \$4 million or more after five years. Engine leases are structured with debt portions of about 80-85%, equity of 15-20% and have debt balloons to pay from resale values. Debt balloons are based on appraisers' predicted resale values, with balloons being up to 80% of predicted resale value. Overall, strong cash streams are often generated from the difference between resale value and equity invested and the debt balloon.

Lease rentals generate cash streams during the lease. These cover a lessor's overheads and monthly debt repayments, and again generate positive cashflows.

Residual value performance

Engines have historically demonstrated persistent residual value retention compared to aircraft. "Engine residual values hold well for a long period and then drop when the type is no longer core to the market," says Dick Forsberg, head of strategy at Lombard Aviation Capital. The JT8D and JT9D both illustrate this, with many traders and lessors generating good business from these engines for several decades until the sudden retirement and implosion of the fleet. "The key to conserving profit in engine transactions is to predict when an engine type will no longer be popular," continues Forsberg.

Types like the CFM56-3 and CF6-80C2 have retained strong residual value performance, and will continue to do so until large numbers of the aircraft they

power are permanently retired.

Engine residual values decline at a lower rate than airframe values. In many cases engine values actually increase. This has sometimes been due to a large number of a particular aircraft type coming back into service after a recession, or due to a combination of tight market supply and inflation. Residual values have held well for modern types which power large numbers of aircraft with OEMs now in the aftermarket and controlling the supply of engines.

Particular examples are the CF6-80C2 and PW4000-94. These power five or more widebody types each, and so the interchangeability gives lessors a wider remarketing base.

It is also easier to assess engines' maintenance status than airframes'. Engine maintenance status depends on the condition of internal turbomachinery and the remaining life of life limited parts (LLPs). Both can easily be assessed and also restored to zero time on-wing status. Moreover, the cost of achieving this can be estimated more accurately than for airframes.

Monitoring maintenance condition is crucial to following engine residual values. Ensuring that adequate maintenance is performed is essential to generating profits from lease transactions.

Engines also represent less remarketing risk for a specialised lessor, since they can be parted out and parts and components sold separately on the aftermarket, often for a total sum that is higher than the engine's fair market value. Although this introduces flexibility into engine leasing, it again underlines the requirement for specialist technical expertise in engines. Aircraft lessors do not have this expertise, despite having access to funds to acquire engine portfolios. This explains the small number of engine lessors in comparison

with aircraft lessors.

One illustration of engine residual value retention is given by Abdol Moabery, president at GA Telesis. "Residual values and lease rentals of popular engines remain high in recessions. The lease rentals of two PW4000s, for example, powering an A310 have been about \$100,000 per month in the recent downturn. This is about equal to the lease rate the A310-300 itself could generate in the current market. Rather than trying to lease the aircraft, it would be simpler to remove the engines and just lease them."

Appraisers are used to predict future engine values when structuring leases, since they are used to determine debt balloons. Market values of engines have softened in recent years, and some can be acquired at good rates. Doug Kelly, vice president of asset valuation at Avitas compares the current market value and future market value in 2008 of several engine types, based on 0% inflation. Because current market values are soft, he expects future values of several types to be higher in 2008. These values are summarised (*see table, this page*).

These values clearly show the current soft market values and high future values based on an improvement in the market, leading to improved asset values.

CURRENT MARKET VALUE & FUTURE MARKET VALUE OF POPULAR ENGINE TYPES

Engine type	Current market value \$ million	Future market value \$ million (2008)
CF34-3B1	1.78	1.78
JT8D-217C	1.79	1.81
CFM56-3C1	3.26	3.18
CFM56-5B1	4.50	4.62
CFM56-7B24	4.16	4.62
V.2500-A5	4.02	4.40
CF6-80C2B6F	4.59	4.50
PW4056	5.09	5.65

Source: Avitas

Lease rentals

High lease rentals are another factor in favour of engine leases. Lease rate factors, expressed as a percentage of purchase or, more importantly, market value are generally high compared to aircraft. "Aircraft lease rate factors are in the region of 0.80-0.85% per month," says Forsberg "while they are 1.0% per month for modern engine types and higher for older engine types."

Charlie Willis, president of Willis Lease Finance Corporation explains that

there are several factors which determine lease rates, and they are variable for the same engine type. Lessee credit risk and market conditions are two important issues, and it is hard to be specific for each engine model.

Moabery says that typical spreads for modern engine types are 0.8-1.0% per month, and 1.0-2.0% per month for older generation engines. While young engine types can be remarketed up to five times, older engine types carry a higher residual value risk, since the aircraft type they power could suddenly become

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unpopular and be retired in large numbers in five years due to unforeseen circumstances. Moabery adds that older engine types also tend to be leased to lessees that are further down the aircraft market 'food chain', and so carry a higher creditworthiness risk. Moreover, the merits of restoring engine maintenance status for further marketing opportunities are questionable. Higher reliance therefore has to be placed on lease rentals. "We actually prefer leasing engines to second-tier operators, because engines attract high lease rental factors and we can make a quicker return. It is also easier to have a personal relationship with a small airline," says Moabery.

Lease rates are affected by a variety of other factors. "These are the position of the asset in its market life cycle, the security package offered by the lessee, the debt advance ratio and size of debt balloon, the lessee's jurisdiction and local currency, and whether interest is at a fixed or floating rate," explains Sharp.

Transaction structure

Lease transactions are structured so that the debt balloon can comfortably be paid by resale values, and the lease rentals can cover overheads and debt repayments.

If debt balloons are high, then monthly debt repayments (that have to be repaid from lease rentals) will be small compared to a transaction with a smaller debt balloon. Negotiating a high debt balloon is therefore important to lessors. The amount of debt advanced is also a crucial factor. The difference between advanced debt and a debt balloon is the amount that has to be repaid during the lease from lease rentals. A low advance

rate means that less debt will have to be repaid, but the lessor's equity investment will be higher. In turn, monthly debt repayments will be also be affected by interest rate. Lessors therefore have to strike a balance between advance debt rate, debt balloon, interest rate, debt repayments, expected lease rates and resale values to generate the best returns.

Debt terms

"The size of debt balloons varies, but depends mainly on a bank's attitude to engines," explains Welaratne. "A conservative bank may only allow low balloons but provide debt at low interest. Other banks will accept higher balloons and so higher risk."

Debt balloons also depend on engine type. Modern types will get higher balloons because of expected better residual value retention. "Banks allow balloons to be related to predicted residual values, which may be as high as 100%, but this is done on the basis that a refinancing instrument will be ready at the end of the lease," says Moabery. "It is possible for V.2500s, for example, to get balloons of 100% of expected resale value, and CF6-50s or CFM56-3s to get balloons of 50-70% of resale value. Older types like the JT8D-200 will only get about 50%." More conservative balloons for modern engine types are about 80%.

Debt advance rates also vary. These are typically 80-85% of purchase price or current market value, as with aircraft. The lessee still represents a risk, even though residual value retention is better compared to aircraft. Certain engine types can be leased at debt advance ratios as high as 90%.

Although engine leasing may have the ability to generate high returns for lessors, the market is still left to a few specialist lessors. Particular skills are required to predict market values, remarketing, technical management and financial management. This hybrid of skills is held by only a few companies.

Interest rates are low, which means that the lease rate factors for modern engine types are in the region of 0.85%. Debt rates are typically 100-400 basis points over Libor. The degree of spread is a reflection on airline credit risk. Some carriers are struggling financially, and so pose a high risk, while others are performing well. A base rate of 3.5% will thus result in an interest rate of 4.5-7.5% for lessors that are externally funded. Others are internally funded or have the facilities to finance portfolios of engines, rather than separate transactions.

ELF is funded internally and Sharp points out that external debt offers cannot match its internal funding terms and rates. "It is an advantage to have fixed debt terms and this allows lease rates to be fixed, which is preferred by lessees," says Sharp.

WLF has a facility to fund a portfolio. It is to pay interest from each month's lease rentals, and is free to choose how much debt principal it repays from the remainder. This frees it from having to monitor each engine transaction on a case-by-case basis. "We have financed a large number of engines with a \$400 million debt transaction and equity of \$60 million," says Willis. "We are also in the process of getting a securitisation to fund more engines."

Maintenance condition

Engine lease transactions are structured on the basis of maintenance condition. Actual maintenance condition at the start of the lease is known, and predicted residual value at the end is based on an assumed maintenance condition at the end. If the actual maintenance condition at the end is worse than originally predicted, resale value will be adversely affected and generate a loss for the lessor. Lessors therefore have to ensure that adequate maintenance is being performed during the lease and that discrepancies between actual and predicted maintenance conditions are compensated for.

Return maintenance conditions are based on assumed utilisation and maintenance during the lease. Lessees or lessors can be responsible for maintenance, but this depends on the lessee and their assumed risk. Lessors often stipulate maintenance guidelines, such as prohibiting Parts Manufacture Approved parts.

Lessors also require some lessees to pay maintenance reserves for security. Lessees then make up the difference between actual maintenance cost and accumulated reserves at the end of the lease. Reserves are kept by the lessor if the engine is halfway between shop visits at the end of the lease. Engines halfway between shop visits can be hard to remarket, and so maintenance may be done.

Return conditions usually stipulate a minimum remaining life for LLPs and

time to next shop visit. Predicted return conditions will be better or worse than starting conditions on the basis of assumed utilisation and maintenance during the lease. In all cases, maintenance reserves should account for predicted maintenance condition. It will be impossible to achieve exact predicted maintenance condition. Cash payments are used to make up the difference between the actual status and predicted condition.

Economics of transactions

Lessors have to structure sale and leaseback transactions to achieve a balance between purchase price, debt and equity, probable resale value, lease rentals and debt repayments and balloons.

In addition to debt repayments, lessors have to consider their own overheads and insurance. Overheads are significant, since substantial technical expertise and management are required to manage a portfolio of engines. "Lessors require a large support capability for engine management, accounting, administration and legal issues," says Willis. "This is especially necessary to avoid residual value risk." This explains why there are few specialist engine lessors and a minimum portfolio of 50 engines is thought to be required.

An analysis of possible cash generated from transactions can be made for several engine types, and based on assumptions for purchase price, advance debt rate, debt terms, lease rentals and other factors. The engines examined are the same as those with future values estimates made by Avitas (*see table, page 9*) and include the CF34-3B1, JT8D-200, CFM56-3C1, CFM56-7B24, V.2500-A5, CF6-80C2B6F and PW4056.

In each case the transaction has been completed over a five-year term, with interest at a rate of 5.5% for all engines, reflecting current market conditions. A debt advance rate of 85% is used for all engine types.

Resale values used are more conservative than those predicted by Avitas, however, and assume a decline in five years rather than an increase.

In all cases an assumed overhead cost of \$5,000 is made. This is equal to \$3.0 million per year for a portfolio of 50 engines.

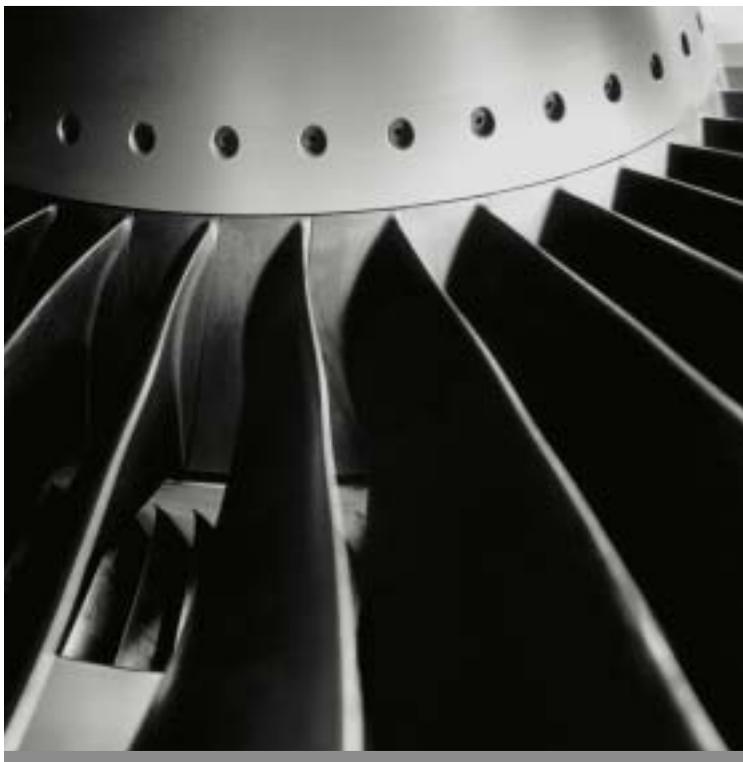
The CF34-3B1 is a modern type acquired for \$1.8 million and leased at a factor of 0.8%, equal to \$14,400 per month (*see table, page 13*). Resale value is assumed to be \$1.7 million in 2008, about \$100,000 less than predicted by Avitas, reflecting a small drop in asset value. A debt balloon term of 80% requires \$1.36 million to be repaid at the end of the lease. This means that monthly debt repayments are about \$9,500, and together with overhead costs are only just covered by the lease rental. The implications are that the transaction would not be attractive as structured, and a lessor would seek higher rentals, if possible, or a higher debt balloon.

The resale of \$1.7 million less debt balloon and equity invested of \$270,000, however, generates \$70,000 cash. Overall, the transaction generates \$62,000 cash over five years for the \$270,000 equity invested (*see table, page 13*). This is a low rate of return compared

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CASH GENERATING POTENTIAL OF ENGINE SALE & LEASEBACK TRANSACTIONS

Engine type	Purchase price \$ oos	Equity invested \$ oos	Debt balloon \$ oos	Monthly lease rental \$	Monthly overhead \$	Monthly Debt repayment \$	Resale value \$ oos	Cash generated \$ oos
CF34-3B1	1,800	270	1,360	14,400	5,000	9,530	1,700	62
JT8D-200	1,800	270	850	25,200	5,000	17,080	1,700	767
CFM56-3C1	3,260	489	1,860	32,600	5,000	26,180	3,100	836
CFM56-7B24	4,160	624	3,280	33,280	5,000	19,995	4,100	693
V.2500-A5	4,000	600	3,120	32,000	5,000	19,730	3,900	616
CF6-80C2B6F	4,600	690	3,080	46,000	5,000	30,205	4,400	1,278
PW4056	5,000	750	3,430	50,000	5,000	31,615	4,900	1,523

to the larger engine types. The CF34-3B1 is disadvantaged by its size and value compared to the monthly overhead.

The JT8D-200 is acquired for \$1.8 million and leased at a rate of 1.4%, equal to \$25,200 per month (see table, this page). Assumed resale value is \$1.7 million, and the debt balloon \$850,000, or 50% of resale value. This requires a monthly debt repayment of about \$17,100, leaving about \$3,000 per month after lease rentals, adding up to a cash generation of \$187,000 over the transaction.

The resale at \$1.7 million less a balloon of 60% (\$850,000) and equity of \$270,000 generates about another \$580,000 and \$767,000 in total for the equity invested (see table, this page).

The CFM56-3C1, being more modern than the JT8D-200, will attract a lower lease factor of 1% of purchase price, equal to \$32,600 per month (see table, this page). Resale value is assumed to be \$3.1 million, allowing a debt balloon of \$1.86 million. This requires a monthly debt repayment of \$26,200, leaving little cash generated from lease rentals and overhead costs.

The resale of \$3.1 million less balloon of \$1.86 million and equity of \$489,000, however, generates about \$751,000, with a total of \$836,000 for the transaction for an equity investment of \$489,000 (see table, this page). Little cash being generated during the transaction from lease rentals means that lessors would either seek higher rentals or a higher balloon to lower debt repayments to make the transaction more balanced.

The CFM56-7B24 is one of the most modern types. Acquired for \$4.16 million, the CFM56-7B24's lease rental of 0.8% or \$33,300 would generate a strong cashflow during the lease. A resale value of \$4.1 million would allow a balloon of \$3.28 million, requiring debt repayments of \$20,000 per month, leaving about \$8,000 per month after deductions

for overhead costs, and \$497,000 over the term (see table, this page).

The resale of \$4.1 million less balloon and equity invested would generate a further \$196,000 of cash, and a total of \$693,000 for an equity investment of \$624,000 (see table, this page).

The V.2500-A5 would have a similar return. If acquired for \$4.0 million and leased at the same rate of 0.8% for \$32,000 per month this would also generate a positive cashflow during the lease. A resale value of \$3.9 million would allow a debt balloon of \$3.12 million, and require monthly repayments of \$19,800. Lease rentals less overheads and debt repayment would generate \$436,000 over the term.

Resale less balloon and equity of \$600,000 would generate a further \$180,000, and a total of \$616,000 for the transaction (see table, this page).

Larger engines with higher purchase prices and resale values generate higher rates of return compared to equity invested.

The CF6-80C2B6F acquired for \$4.6 million may be able to attract a lease rental of 1%, since it is an older engine type than the V.2500-A5 and CFM56-7. This would be equal to \$46,000 for the CF6-80C2. A probable resale value of \$4.4 million and balloon rate of 70% would mean debt repayments of \$30,200 would have to be made, leaving a margin of about \$11,000 per month from lease rentals and \$648,000 over the transaction.

A sale value of \$4.4 million less balloon and equity investment of \$690,000 would generate a further \$630,000, and a total of \$1.27 million for the transaction. This is only, however, due to a high lease rental factor and resale value compared to the original purchase price. This is still conservative compared to future value estimates.

The PW4056 acquired for \$5 million generates a similar return. Lease rentals

of \$50,000 and a debt balloon of 70% on an estimated resale value of \$4.9 million mean that monthly debt repayments are \$31,600. Cash generated from lease rentals less overheads and debt payments is about \$800,000 over the term (see table, this page).

In addition, resale less balloon payment and equity of \$750,000 generates a further \$720,000 and a total of \$1.52 million for the whole transaction (see table, this page).

Caveats

Although the parameters used to analyse these transactions are approximate, they use market rates and illustrate the returns that are possible if engines are acquired and sold at the right value, and lease rates obtained from lessees.

Small rises in interest rates and overheads, drops in lease rentals, defaults on lease payments, inaccurate assessment of maintenance condition or required maintenance reserves, and falls in market values can all severely affect the profitability of these transactions, especially if two or more of these problems occur together.

The inherent risks can also be compounded by economic and political factors which can have a strong impact on engine values and lessees' ability to maintain rental payments.

These factors underline the technical capability and expertise required to manage engine leases and enter this market.

Another consideration is the issue of book depreciation, taxable profit and tax liability on a transaction and how this compares to cash generated. While the examples analysed illustrate theoretical cash generating potential, lessors will want to structure transactions so that the ratio of cash generated to tax liability is high. **AC**